

Information Paper II

Practices Employed in Socio-Ecological Production Landscapes

This paper is a preview of one of the proposed activities of the International *Satoyama* Partnership i.e.; “collecting, analyzing and deriving lessons from case studies and promoting the dissemination of information related to technology. The categories of practices indicated in the following table are subject to increase or amendment based on further research.

Case studies of these practices will be compiled and analyzed following a verification of their adaptability and effectiveness in several countries and regions for dissemination through the online portal of the *Satoyama* Initiative.”

Table: Practices Identified through Case Study Analysis

Categories (Practices)		Relevance to the five perspectives of the <i>Satoyama</i> Initiative (●: Highly relevant, •: Relevant)				
		Resource use within the carrying capacity and resilience of the environment	Cyclic use of natural resources	Recognition of the value and importance of local traditions and cultures	Natural resource management by various participating and cooperating entities	Contribution to local socio-economies
1	Securing a functional resource-circulation system through the introduction of compound, multi-layered land use (agroforestry, home garden, mosaic land use etc.)	●	●	●	•	•
2	Introduction of agriculture, forestry and fishery with consideration for the conservation of biological and ecological functions (permaculture, organic farming, low-input farming, ecosystem-friendly farming and forestry, resource controlling fishery etc.)	●	●	●	•	•
3	Effective utilization of multi-dimensional functions of ecosystem services using vegetation (bioshield, forest-conservation-based erosion control etc.)	●	•	•	●	●
4	Development of local industries and local revitalization using traditional culture and technologies (community business, handicraft, development of local specialties etc.)	●	•	●	•	●
5	Biomass utilization within the carrying capacity of local natural resources (utilization of biomass energy and biomass materials)	●	●	•	•	●
6	Mechanisms of joint forest management and use and profit sharing among participants (community forestry, social forestry, residential forestry etc.)	●	•	•	●	●
7	Channeling of the profits from cultural ecosystem services into natural resources management (eco tourism, green tourism, agri-tourism etc.)	●	•	•	●	●
8	Promotion of agriculture and conservation of farmland by linking farmers and consumers (CSA, community food system, box scheme, local production for local consumption, cooperation between producers and consumers etc.)	●	●	•	•	●
9	Conservation and management of upstream forests by fishermen and water users (watershed management, upstream and downstream cooperation etc.)	●	●	•	●	●

1

Securing a functional resource-circulation system through the introduction of compound, multilayered land use

- Agroforestry
- Home gardens; mosaic land uses

Overview

- Agroforestry is a practice of agriculture and forestry to plant a forest and raise livestock and cultivate agricultural produce in the forest; it is a land use characterized by the multi-layered uses of space in the vertical direction.
- Home gardens seen in East Asia and “satochi” and “satoyama” of Japan are examples of compound land uses of one contiguous space in the horizontal direction, in which, for example, irrigated rice fields, dry farmland, woodland and grassland are allocated in a mosaic pattern, centering around the residential area.

Lessons Learnt

- These practices represent the uses of various resources and services that are provided by trees and forests (e.g. fruits, fallen leaves and branches, forest floor plants, water purification and cultivation functions and provision of shades) for the purposes of crop cultivation, livestock raising and daily life of people. Furthermore, they make it possible to carry out the sustainable, intensive, and holistic land uses by facilitating the effective circulation of the resources that are produced by agricultural land, grassland, livestock etc.

Tips for the introduction of these practices

- In case that problems such as forest resources depletion, soil degradation, water pollution and decreased productivity due to pollinator decrease or other reasons happen in places where timber, agricultural produce or forage crops are produced as a single product in an individually managed forest, agricultural land or pasture, it is likely that the balance between the local environmental capacity or natural resilience and the natural resource use has collapsed. In such cases, it is effective to change the land use practices to more sustainable ones.
- When the introduction of compound and multi-layered land uses is considered, it is important how effectively resources and services are extracted from forests, farmland, grassland, livestock etc. and how effectively they are used and circulated. It is also necessary to identify the combination that suits the specific conditions of local climate and landforms.
- In case that the compound and multilayered land uses that had been carried out in the past as local traditional practices were replaced by simple and single land use styles -- or land use itself is completely discontinued -- due to socioeconomic change, it is desirable that the traditional land use practices should be re-evaluated from the point of view of their functionality and effectiveness in the context of resource circulation.

Case study Compound land uses of terrace rice fields, slash-and-burned fields, and “muyong” (secondary forests) in the Province of Ifugao, the Philippines

Ifugao people have been developing terrace rice fields for wet rice culture in a mountainous area since old times. They also cultivate varieties of potato in dry farmland as foods for the periods between rice seasons; they also harvest various useful goods such as building materials, firewood and medicine from the secondary forests locally called “muyong”.

They know from their past experience the appropriate management practices for these lands: a dynamic management has been practiced by switching between terraced rice fields, dry farmland and “muyong”, depending on the conditions of season and site. As a result, the conditions that support the availability of useful goods that are necessary for daily life have been maintained at all times. This situation in which a mixture of diverse environmental types exists contributes to the conservation of biodiversity.

Prepared by the Ministry of the Environment, Japan

<<Data>>

Location: Province of Ifugao, the Philippines
Participants: Local residents (Ifugao)
Aim: Sustainable harvesting of products necessary for daily life



Terrace rice fields, “muyong”, and water source forests in the mountain area of the Province of Ifugao.

2

Introduction of agriculture, forestry and fishery with consideration for the conservation of biological and ecological functions

- Permaculture; organic farming; low-input farming; ecosystem-friendly agriculture, forestry, and fishery
- Resource managing fishery etc.

Overview

- Permaculture is a farming system that will not cause over-exploitation or pollution by allocating flora, fauna, buildings, and production bases in one space to construct an ecologically healthy and economically viable system.
- Organic farming and low-input farming are agricultural practices that maintain fertility and improve sustainability by reducing agricultural inputs such as chemicals and fertilizers to reduce soil contamination and water pollution which are the foundations of agriculture, forestry, and fishery.
- Ecosystem-friendly agriculture, forestry, and fishery are practices that aim to coexist with animals that nest and inhabit in and around farmland and forests to sustain agriculture and forestry while reducing their impacts on the habitats and ecosystems.
- Resource-managing fishery is a practice that sustains fishery industry without exhausting the resources by controlling the amount of catches to within the resilience of fishery resources and by maintaining and improving the resilience.

Lessons Learnt

- Primary industries including agriculture, forestry, and fishery are sustained by directly receiving provisional services from natural resources; they depend on the resilience of cultivated plants, trees, and fish and shellfish to be produced. Therefore, these industries cannot be sustained unless the participants limit the amount of crops yields and catches within the resilience.
- Also, the natural resilience may decline due to the deteriorated soil or marine environment after many years of cultivation or the influences of the changes in the surrounding environment and climate change.
- These practices are wisdoms to improve the sustainability of agriculture, forestry, and fishery and to leave the fundamental environment of these industries to the future generations. As a result, these practices enable to maintain the health of secondary nature including farmland, forests, and coastal zones.

Tips for the introduction of these practices

- In case areas where the key industries are agriculture, forestry, and fishery are experiencing problems such as decreased yields and exhaustion of resources, it is necessary to check the relationship between the amount of yield and natural resilience and changes in natural resilience.
- It is important to establish healthy circulation of organic matters and nitrogen when trying to reduce agricultural impacts on animals and ecosystem. In order to do so, it is effective to flexibly share resources based on mutual cooperation of agriculture, forestry, and fishery industries.
- Traditionally practiced agriculture, forestry, and fishery often include wisdoms of predecessors to coexist with nature; thus, it is effective to reevaluate these practices using modern sciences and knowledge.

Case study Dairy farming that succeeds both in the production of added-values and environmental conservation through the introduction of bio farming

The state of Bavaria is an area where the characteristic landscape is the pasture-oriented agricultural villages established through dairy farming. The residents switched from raising cattle to goats in order to continue dairy farming as lasting occupation. They also started bio-farming to increase the value of their products. They can sell the crops produced through bio farming for about double the price of ordinary crops in the market. They can also expect to increase their earnings by selling products that suit the demand of the modern consumption styles. This practice enables them to continue dairy farming as lasting occupation and helps conserve the environment and landscape of agricultural villages.

Prepared by the Ministry of the Environment, Japan

« Data »

Place: Bavaria, Germany
 Participants: Local dairy farmers
 Aim: Promotion of stock-breeding, conservation of natural environment and landscape



Typical landscape of agricultural village in Germany

3 Effective utilization of multidimensional functions of ecosystem services using vegetation

●Erosion prevention through forest conservation; bioshield etc.

Overview

- This practice aims to succeed both in the conservation of biodiversity and sustainable use of natural resources by focusing on functions of vegetations that are beneficial to humans such as functions to prevent erosion and replenishment of water sources.
- Specifically, this practice includes “erosion prevention through forest conservation” which aims to prevent disasters in downstream areas and secure water sources by conserving or restoring forests in mountains as well as “bioshield” which aims to reduce damages from floods and high tides through conserving or restoring coastal forests.

Lessons Learnt

- Areas that are experiencing problems such as increased natural disasters and water shortages often have problems of people’s uses of natural resources (e.g. deforestation to create farmland , excessive deforestation to gather fuel) which are causing deterioration of ecosystem services that are relevant to the problems.
- Thus, in order to fundamentally resolve such problems, it is effective to conserve and restore secondary nature as an inclusive measure to resolve problems with the use of natural resources from long-term perspectives in addition to building infrastructures to directly deal with such problems (e.g. building dams and shore protections).

Tips for the introduction of these practices

- When introducing this practice, it is necessary to examine whether overexploitation of natural resources is causing regional problems. If the examination confirms that overexploitation is indeed the fundamental cause of the problems, it is necessary to work on conservation and restoration of the natural environment using methods to appropriate the region’s environmental carrying capacity and natural resilience.
- Many ecosystem services that this practice deals with are public services that benefit unspecified majority (such as disaster prevention and replenishment of water sources). Thus, public organizations such as government agencies and international organizations need to take initiatives in promoting participation and cooperation of various stakeholders.
- Since this practice is a long-term and specific effort, it requires assistance from international organizations and NGOs in the initial stages as well as human resources development toward autonomous management by local residents. It is also crucial to provide new means of livelihood so that the practice will not deprive the benefits of entities that have been managing and using the lands and natural resources for a long time.

Case study Mangrove forest restoration to alleviate tsunami damages and ensure new means of livelihood

Areas around Bolgoda Lake, Sri Lanka used to be devastated by tsunamis. Thus, NGOs and local residents together started restoration of mangrove forests to prevent new tsunami damages.

The restored mangrove forests function as wave-breaking forests. They are also used for various purposes such as prawn farming, fruit cultivation, and eco tourism which have become the new means of livelihood of local residents who were devastated by tsunamis. Educations and training on sustainable fishery and agriculture are also being provided. These activities have restored mangrove forests in 18 locations and contributed to the conservation of biodiversity.

« Data »

Place: Southwestern part of Sri Lanka
 Participants: Local residents, NGO, government (NARA, Ministry of Environment and Natural Resources etc.), international organizations (IUCN, Ramsar etc.), universities
 Aim: Alleviation of tsunami damage and generation of new means of livelihood

•Community business; handicrafts; development of local specialties etc.

Overview

- This practice generates new industries which create new income sources for local residents and implements activities to conserve landscapes and biodiversity by incorporating traditional cultures and technologies of using natural resources. The practice helps promote regional economy and improve the prides of local residents through such activities.

Lessons Learnt

- Traditional cultures and technologies work excellently with regional natural conditions and often involve small-scale utilization of natural resources that assume the conventional self-sufficient social and economic systems. Thus, implementing natural resource management and utilization based on traditional practices contributes to maintain healthy secondary nature such as farmland, forests, and coastal zones.
- Improvement of the livelihood of local residents through this practice reduces inappropriate utilization of natural resources that used to support their livelihoods (such as excessive deforestation, farming, pasturing, and fish catches) and contributes to improve the health of secondary nature.

Tips for the introduction of these practices

- It is necessary to determine optimal quality and quantity of the natural resources to use so that changes brought by the introduction of this practice would not impair the balances of natural resources and ecosystem in the entire region but instead result in the resolution of problems such as overexploitation or underutilization of natural resources.
- Traditional cultures and technologies are declining often because they cannot keep up with the changes in social and economic systems. Therefore, they may not function well if they are simply restored. When restoring traditional cultures and technologies, it is necessary to pay attentions to new stakeholders who were not present before and to find ways to introduce them to suit the modern societies and systems.
- The profits generated through the use of traditional cultures and technologies need to profit not only the groups that engage in production and sales but also benefit local societies and residents that have been inheriting the cultures and technologies. Ensuring stable profits requires securing stable sales channels and the development of human resources toward autonomous operations.

Case study Reintroduction of traditional reed cultivation and production of handicraft to conserve biodiversity and improve earnings of local residents

Podujana Himikam Kamituwa, the organization for educational rights of residents in Kalutara, Sri Lanka implemented reintroduction project of reed cultivation which used to be widely practiced in this region and handicraft production using the reed aiming to restore the region's biodiversity and reduce poverty.

Their efforts have resulted in reed cultivation and textile production as new means of livelihood and improved the earnings of the local residents. They also restored small-scale land utilization units made up with irrigated rice fields, reed fields, and home gardens which are the traditional agricultural style of the, and the number of species that nest and inhabit in the region has been increasing.

This project was funded by GEF under the Small Grants Programme and awarded the equator prize 2004.

Edited from <http://sgp.undp.org/downloads/Biodiversity%20-%20srilanka%20Ea.pdf>

« Data »

Place: Kalutara, Sri Lanka
Participant: Local organizations, local residents, national government of Sri Lanka, international organizations etc.
Aim: Conservation of biodiversity, poverty reduction and inheritance of traditional culture



A local resident weaving textile using reed

5 Biomass utilization within the carrying capacity of local natural resources

- Utilization of biomass energy (power generation and fuel generation)
- Utilization of biomass material

Overview

- Utilization of biomass energy gathers or cultivates bio-based organic resources such as woods, grass plants, and animal wastes within the region's natural resilience and converts them into electricity and fuel to be used by residents and industries.
- Similarly, utilization of biomass materials gathers or cultivates organic resources within the region's natural resilience and utilizes them to manufacture products.

Lessons Learnt

- In areas where natural resources are exploited, improved efficiency through the use of technologies to utilize biomass and the alternative use of unused resources reduce the use of natural resources. It also contributes to maintain healthy secondary nature such as farmland, forests, and coastal zones.
- In areas where the use of natural resources is decreasing, switching to energy and products with high added-values that are produced using biomass utilization technologies promotes the use of natural resources and contributes to maintain healthy secondary nature such as farmland, forests, and coastal zones.

Tips for the introduction of these practices

- Biomass utilization is a practice to extract resources that are useful to humans from the system of resource circulation. Securing healthy resource circulation is essential in this practice. The implementation of this practice requires careful study of utilization flow so that the amount of the material procurement will not overwhelm the natural resilience, or the amount of waste generation after utilization will not exceed natural carrying capacity.
- In order to maximize the effect of biomass utilization, it is obviously necessary to avoid deterioration of a region's resource circulation; it is also important to find ways to utilize the resources by producing a new relationship among materials so that it helps resolve the issues of overexploitation and underutilization of natural resources. It is also necessary to take account of the overall balance of natural resources utilization including food production, fertilizer production, and chemical manufacturing which are the forms of utilizing other provisional services.
- Profits generated through biomass utilization must profit the groups that convert them into energy and products and benefit local societies that are in charge of managing the natural resources which are the sources of biomass. Ensuring stable profits requires securing stable sales channels and the development of human resources toward autonomous operations.

Case study Restoration of natural environment and commercialization of crops and livestock products with high added-values through the cooperation among biogas power generation, agriculture, and livestock industry

In Kyoto, Japan, private companies, local government, and local residents are cooperating to conduct organic farming using compost and liquid fertilizers which are the byproducts of biogas power generation using food wastes, and forest grazing of dairy cattle that also functions as forest management, aiming to restore the deteriorated farmland and forests and to revitalize the local economy.

As a result of their efforts, resource circulation has been restored through biomass utilization, and the deteriorated irrigated rice fields and forest environments became healthier. Products with high added-values such as organically produced rice and high quality dairy products have also been developed; new industries that utilize the natural resources of agricultural villages are being produced.

Prepared by the Ministry of the Environment, Japan

« Data »

Place: Kyoto, Japan
 Participants: Private companies, local farmers and foresters, Kyotango City etc.
 Aim: Conservation of forests and farmland, revitalization of local economy and the prevention of global warming



Organic and chemical-free rice paddy that uses byproducts of biomass power generation

6 Mechanisms of joint forest management and use and profit sharing among participants

●Community forestry; social forestry; resident forestry etc.

Overview

- Mechanisms of joint forest management and use by local residents and profit distribution among participants are employed in the field of international development and assistance as methods to succeed both in stabilizing the economy of regions with forests and conservation of biodiversity.
- This method was initially called “social forestry,” but in the recent years it is often called “community forestry” to emphasize the participation of regional societies. It is also called “resident forestry” to emphasize the local residents’ initiatives in forest management and profit distribution.

Lessons Learnt

- Clarifying rights and responsibilities associated with local residents’ forest management and uses enables to limit disorganized use by individual residents and allows all local residents to receive fair and stable earnings.
- Also, the cooperation of local residents enables them to gain abilities to gather information and negotiation skills to work against illegal deforestation and development and to sell crops from forests for proper prices.
- This practice contributes to maintain healthy secondary nature through such aspects.

Tips for the introduction of these practices

- In case forest resources are currently overexploited due to the disorganized use by local residents or illegal deforestation or development pressure from outside, which are relating to the expansion of regional economic disparities or poverty, it is effective to incorporate the mechanisms of joint forest management and uses and profit distribution among participants.
- In order to ensure a smooth conversion into the mechanism of joint management and uses, rights and obligations of local residents and rules for the management and uses must be determined based on the opinions of stakeholders, and the decisions must get across to the residents through education. It is also effective to obtain recognitions or certification on the rights and obligations of local residents from public institutions in order to stand up to the pressures from outside.
- Profits generated by selling the crops from shared forests must be fairly distributed to local residents based on clearly defined rules. Ensuring stable profits requires securing stable sales channels and the development of human resources toward autonomous operations.

Case study Sustainable use of forest resources through community forestry in mountainous ethnic minority communities

Community forestry is being promoted in Chiang Mai, Thailand through the assistances of NGOs.

The village of Meala Up, the community of mountainous ethnic minority, has established forest zoning and rules for management and uses in order to deal with the decreasing flora and fauna due to overhunting and forest devastation.

As efforts to promote forest protection, they have revived tree planting practice to commemorate child births which is the traditional event of the region, and introduced biogas power generation as alternative energy. As an effort to utilize forests, they are also manufacturing and selling T-shirts where profits are used to plant trees.

« Data »

Place: Chiang Mai, Thailand
Participant: Local residents and NGO
Aim: Sustainable use of forests



Rest area at a nature observation trail inside a protected forest

7 Channeling of the profits from cultural ecosystem services into natural resources management

- Eco-tourism; green tourism; agri-tourism etc.

Overview

- This practice focuses on the spiritual and intellectual values of a region's unique natural and cultural resources and values as recreational and educational spaces and offers tour programs using regional resources for visitors from outside.

Lessons Learnt

- Unique secondary nature formed through the efforts of humans with the background of the region's unique natural environment, history, and culture can become attractive tourism resources for visitors from outside. Working on eco-tourism using such resources helps improve the earnings of local residents and prevent loss of population from the region.
- In the process of working on eco-tourism using secondary nature, local residents assume different roles and recognize the effects such as increased earnings, through which they renew their prides toward inheriting the values. Such process is expected to expand into conservation and management activities.

Tips for the introduction of these practices

- Implementation of this practice requires succeeding both in conservation of regional resources and in their utilization by visitors. Thus, it is crucial to identify the region's environmental carrying capacity and then determine the number of visitors to accept so that it will not negatively affect resource conservation and prevent overexploitation.
- Participation of various stakeholders of regional resources which are the sources of cultural services is essential in implementing this practice. In some cases, however, people who manage regional resources (such as farmers, foresters, and fishermen) and those involved in tourism (such as tourist industry) are not the same. Thus, the stakeholders need to have sufficient discussions to share policies to succeed both in conservation and utilization and to properly assign roles.
- Profits generated through the utilization of regional resources for tourism must be restored to profit groups that engage in productions and sales as well as to benefit regional societies and residents who have inherited the resources. Ensuring stable profits requires securing cultivation of clients and the development of human resources toward autonomous operations.

Case study Conservation of grassland ecosystem and eco-tourism activities around Sangay National Park

ASARATY has provided instructions on sustainable pasturing technologies to the residents who live around Sangay National Park and started programs to conserve the grassland environment through pasturing practices. The local residents also started working as tour guides to offer eco-tours that take tourists around the grasslands where alpacas are grazing.

This practice has helped conserve the grassland environment, and the guide fees and the profit of selling folk crafts to tourists have improved the earnings of the residents. The residents are gradually becoming able to afford education and daily commodities thanks to the improved earnings. They have also become proud of being the residents of this region, which is preventing loss of population from the region.

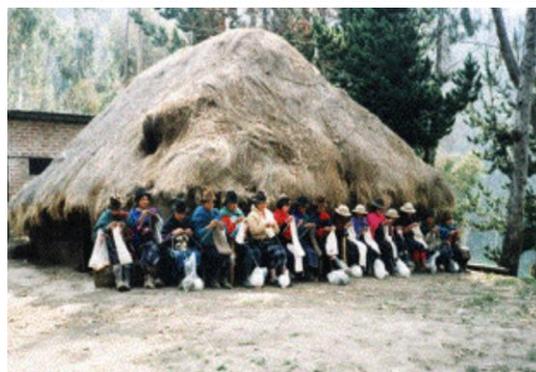
This project was awarded the equator prize 2004.

« Data »

Place: Surrounding areas of Sangay National Park, Ecuador

Participants: Local residents, citizens group (ASARATY), NGOs, international organizations (UNESCO) etc.

Aim: Conservation of grassland environment and poverty reduction



Local female residents weaving with alpaca wool

Edited from http://equatorinitiative.org/index.php?option=com_content&view=article&id=491&Itemid=531&idx=49

8 Promotion of agriculture and conservation of farmland by linking farmers and consumers

- SA (community-supported agriculture); community food system; box scheme; local production and local consumption; cooperation between producers and consumers

Overview

- These practices aim to contribute to the conservation of farmland which are the secondary nature and reduction of food mileages by establishing a direct relationship between farmers and consumers who live in urban areas and to stabilize agricultural operations. They have been widely practiced in North America, Europe, and Japan in the recent years.
- The details of the practices vary, but it generally involves a system to share the risks associated with varying annual quality and quantity of yields among farmers and consumers, such as a system in which consumers make advanced payments to farmers as membership fees or establishing membership-based joint farmland .

Lessons Learnt

- Introducing this practice allows farmers to secure stable sales channels and consumers to obtain higher quality agricultural crops for lower prices than the general market prices. This practice helps reduce the loss of farmland which are the places for food production and abandonment of farmland management.
- Also, directly communicating the consumers' demands for safe and reliable agricultural crops with to farmers may promote the spread of sustainable agricultural practices such as low-input farming.

Tips for the introduction of these practices

- Stable agricultural operation requires established sustainability of soil and water which are the foundations of the operation. Therefore, introduction of this practice requires reconfirmation of the status and causes of problems such as reduced fertility of farmland and reduced amount of agricultural water and then select types of crops and agricultural methods that enable production within a given environmental carrying capacity and natural resilience.
- Increasing the effects of this practice requires the establishment of healthy resource and water circulations based on a perspective of a wide range material flow that covers from the production of agricultural crops and to the disposals of food wastes. In order to do so, it is effective to promote cooperation among dairy farmers who provide composts and fertilizers, food processors and waste disposal industries that generate food wastes, and management groups of forests which act as the buffer zones of farmland and water sources.
- Improving the long-term sustainability of agriculture and farmland require development of agricultural successors; thus, it is effective to implement programs to assist those who wish to start agriculture. Maximizing the effects on regional society and economy require not only to secure stable consumers but also to establish partnerships with various groups in urban areas such as cooperation with other industries and educational institutions.

Case study “Community food system” that aims for integrated development of local environment, economy, and society through agriculture

An NGO in Burlington, Vermont, the United States has restored waste disposal sites as farmland while assisting people who wish to start agriculture and running joint farmland where local residents participate. Agricultural crops produced in the farmland are provided to local hospitals and restaurants.

As an agricultural project implemented through the cooperation with various groups in urban areas to contribute to sustainable regional development, they are implementing activities including fertilizer production using dead leaves and food wastes, tree planting to create forest buffers in cooperation with farmers, and agricultural education in cooperation with schools.

« Data »

Place: Vermont, USA

Participants: NGOs, farmers, the City of Burlington and the State of Vermont

Aim: Integrated development of local environment, economy, and society through the promotion of agricultural practices

9 Conservation and management of upstream forests by fishermen and water users

●Watershed management; upstream and downstream cooperation etc.

Overview

- In this practice, users of water resources and fishermen (including fish farmers) in coastal zones recognize that they are the beneficiaries of ecosystem services that are originated in upstream forests and provide funds and labor forces for conservation and management of the forests in order to receive sustainable services in the future.

Lessons Learnt

- Collecting funds and labor forces from many and various types of beneficiaries and inputting them into conservation and management of forests enables to contribute to the enhancement of multidimensional ecosystem services and maintain healthy forest ecosystem which are the sources of the services.
- Also, enhancing multidimensional ecosystem services of upstream forests (water supply, sediment discharge prevention, supply of nutrient salts) indirectly contributes to improve the health of secondary nature (farmland, coastal zones etc.) in river basins and along rivers.

Tips for the introduction of these practices

- In order to enhance ecosystem services, it is important to first examine the relationship among relevant resource circulations and human activities and explore factors that cause the decline of the services. It is effective to implement this practice if the examination found that overexploitation or underutilization of natural resources in upstream forests was the fundamental cause of the decline of the services, and the supports of the beneficiaries are not properly restored.
- There is not a one-on-one relationship between forests which are the sources of ecosystem services and beneficiaries; rather, it is a part of complicated chain of materials such as water, nutrient salts, and organic matters. Therefore, it is necessary to identify the status of wide-range resource circulations and problems and plan forest conservation and management methods that help resolve the problems.
- Participation and cooperation of various stakeholders are crucial in implementing this practice. Meanwhile, the practice often involves beneficiaries who live in remote locations. Therefore, there are many ways to be involved in forest conservation and management such as conservation and management groups, sponsors, and temporary workers. Thus, stakeholders need to have discussions to properly assign roles. Involvement of public entities such as government agencies and international organizations is also effective when necessary.
- In order to seek support of beneficiaries in this practice, it is necessary to make it clear that this practice will contribute to long-term improvement of their lives and businesses. Thus, quantitative evaluation of ecosystem services (such as calculation of economic values) based on scientific knowledge is effective.

Case study “Forest is the best friend of ocean” activity in the basin of Kesenuma Bay

Kesenuma Bay is a calm inner bay into which multiple rivers flow. Fish farming including oyster has been actively conducted in this area. In recent years, however, the fishermen in Kesenuma Bay noticed that the marine environment had been deteriorating along with the changes in the conditions of rivers and the environment of the basins.

Thus, the fishermen asked for the support of foresters and farmers who share the same basin and started planting trees in upstream areas beyond the prefectural border to protect the ocean. As a result, the residents of the basin came to recognize their mutual influences even when they lived in different places and became more motivated to run environmentally friendly agriculture, forests, and fisheries. The tree planting activities by the fishermen became widely known around Japan, and the oysters of Kesenuma Bay became more popular than other oysters.

« Data »

Place: Miyagi and Iwate Prefectures, Japan
Participants: Fishermen, farmers, foresters etc.
Aim: Conservation of the natural environment in the water basin, promotion of agriculture, forestry, and fishery in the basin

Translated and edited from <http://www.kakinomori.jp>