

1. Regional Profile

Geographical Location	Country and Region	Basin of the Ohkawa River in Miyagi Prefecture and Iwate Prefecture, Japan; East Asia												
	Longitude and Latitude	North Latitude 38°53'7"; East Longitude 141°35'27' (the mouth of the Ohkawa River)												
	Geographical Conditions	<ul style="list-style-type: none"> • Region of fishing villages • Approximately 400 km in a straight line from Tokyo (capital) • Approximately 90 km in a straight line from Sendai (prefectural capital) 												
Natural Environment	Topography and Altitude	<ul style="list-style-type: none"> • Most of the basin of the Ohkawa River is a mountainous district, with flatland limited to the urban area in Kesennuma at the mouth of the river. • The coast at the mouth of the Ohkawa River has a saw-toothed coastline. 												
	Climate	<ul style="list-style-type: none"> • The annual mean temperature is approximately 10.8°C, and annual precipitation is approximately 1,371 mm. • The area is classified as Cfa (humid subtropical climate) by the Koeppen climatic classification. 												
	Vegetation and Soil	<ul style="list-style-type: none"> • Forests account for most of the vegetation in the basin of the Ohkawa River. • The lower river region mainly has secondary forests of Japanese red pines and artificial forests of cedars, while the upper river region chiefly has secondary forests of konara oaks and Japanese red pines and artificial forests of cedars. • The soil is brown forest soil. 												
	Biodiversity and Ecosystem	<ul style="list-style-type: none"> • The basin of the Ohkawa River features diversified river landscapes and natural environments. Highly natural forests remain in the mountainous districts in the upper river region, while the midstream region has ravines inhabited by the brook trout and other fish. There is tideland around the mouth of the river that serves as a feeding ground for the sea gulls and other birds and as a migration place for the whooper swans and ducks. • Kesennuma Bay, into which the Ohkawa River flows, is rich in plankton due to the quiet environment specific to inner bays of saw-toothed coastlines and various kinds of nutrient flow into it from the Ohkawa River, forming rich coastal ecosystems. Fish and shellfish have been cultivated for a long time, as people make the most of this environment. 												
Social Background	Population and Changes in Population	<ul style="list-style-type: none"> • The population of the city of Kesennuma, located in the lower reaches of the Ohkawa River, was 58,320 as of 2005. The population has been consistently falling in recent years. • The aging rate (proportion of people aged 65 or older to the total population) in Kesennuma stood at 26.2% in 2005, and has been consistently rising in recent years. 												
	History and Culture	<ul style="list-style-type: none"> • It is thought that humans have been active in Kesennuma for a long time since the city has a shrine that is recorded in a list of shrines in the 10th century. • The basin of the Ohkawa River has been developed through fishery and shipping, mainly with Kesennuma Port as a base, and forestry in inland areas. 												
	Regional Economy	<ul style="list-style-type: none"> • The major industries of Kesennuma are the fishery and marine product processing industries. Recently, local economies have been generally depressed due to changes in the industrial structure, outflow of population, and aging of the population. • The number of workers in each industry sector in 2005 is as follows. <table border="1" data-bbox="571 1758 1401 1926"> <tr> <td>Primary Industry (agriculture, forestry and fishery)</td> <td>2,671</td> <td>9.8%</td> </tr> <tr> <td>Secondary Industry (mining, manufacturing and construction)</td> <td>7,342</td> <td>27.0%</td> </tr> <tr> <td>Tertiary Industry (commerce, tourism and others)</td> <td>17,148</td> <td>63.1%</td> </tr> <tr> <td>Total*</td> <td>27,161</td> <td>100.0%</td> </tr> </table> <p><i>*Note: As the percentages of workers in Primary Industry, Secondary Industry, and Tertiary Industry are rounded off to one decimal place, they may not add up to 100.0%.</i></p>		Primary Industry (agriculture, forestry and fishery)	2,671	9.8%	Secondary Industry (mining, manufacturing and construction)	7,342	27.0%	Tertiary Industry (commerce, tourism and others)	17,148	63.1%	Total*	27,161
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2. Use and Management of Natural Resources in the Region

(1) Use and Management of Natural Resources in the Past and Present

1) Land Use Related to the Use and Management of Natural Resources in the Past and Present

- Forests account for most of the land use in the basin of the Ohkawa River, with mountains, forests, and moors accounting for approximately 92%; farmland, for approximately 3%; and urban areas, for approximately 5%.
- The Ohkawa River threads its way through mountains and forests in the upper stream and midstream regions of the river. Farmland and settlements are distributed in a narrow flatland along the river.
- The land around the mouth of the Ohkawa River is flat and urban areas of Kesenuma are distributed there.

2) Objectives and Details of the Current Use and Management of Natural Resources

- Fishery: The saw-toothed coastline of Kesenuma Bay provides a good natural port with calm waves, and it has long been used by fishing boats from around the country as bases for deep-sea and offshore fisheries. The area is also a fishing ground with rich resources, where mariculture of oyster, wakame seaweed, and kombu and fixed-net fishery are carried out. In addition, since salmon swim upstream in the Ohkawa River, a project to hatch salmon eggs and raise and release the young into the river is carried out.
- Forestry: Forest products such as lumber, charcoal, and compost used to be produced in forests. However, the amount of forest use has decreased in recent years, reflecting changes in socioeconomic situations.
- Agriculture: The area of farmland and its production are small, since there is little flatland in the basin of the Ohkawa River. However, a variety of farm products is produced, including rice, vegetables, and livestock products.



Picture: Landscape of Kesenuma Bay, with Floating Culture Rafts

(2) Problems Associated with the Use and Management of Natural Resources and their Impact on Biodiversity

[Water quality degradation in Kesenuma Bay and damage to fisheries]

- Damage to fisheries became serious around 1970 due to a degradation in the quality of water in Kesenuma Bay. Kesenuma's cultured seaweed, which had been highly valued across the country, was completely destroyed because of this water quality degradation. In addition, red tides started occurring frequently in summer, and "blood oysters," or oysters with red meat caused by the red tide plankton, began occurring.
- The causes of these red tides were a lowering of the water purification function of river organisms as river banks of the Ohkawa River, which flows into Kesenuma Bay, had been hardened by concrete through shore-protection works; and an influx of domestic and agricultural wastewater.
- When the water quality degradation and damage to fisheries were getting serious, as mentioned above, a final plan to build the Niitsuki Dam at a point only 8 km upstream from the mouth of the Ohkawa River, which flows into Kesenuma Bay, was announced in 1988. This plan gave rise to misgivings about further water quality degradation and damage to fisheries. (The dam construction plan was cancelled in 2001.)

[Deterioration of forest environment in the upper stream region of the Ohkawa River]

- Among the forests in the basin of the Ohkawa River, devastation of the forest environment advanced in the secondary forests of Japanese red pines and Konara oaks due to the rapid progress in vegetation succession, as demand for trees for use as firewood and green manure had been lost as a result of popularization of fossil fuel and chemical fertilizers.
- Devastation of the forest environment also advanced in the artificial forests of cedars, which had been planted since the 1950s, since management of thinning and other activities were discontinued because of the depressed forestry industry.

(3) Regional Plans and Other Measures toward a Resolution of the Above Problems

[Administrative plans in the basin of the Ohkawa River]

- To cope with the aforementioned problems, Kesenuma City, Ichinoseki City, Miyagi Prefecture, and Iwate Prefecture, which are relevant local governments concerning the basin of the Ohkawa River, came up with various plans regarding regional development and agriculture, forestry, and fishery.
- Miyagi Prefecture and Iwate Prefecture formulated the Basic Policy on River Improvement of the Ohkawa River System in 2006 as a plan to comprehensively improve the basin of the Ohkawa River.
- No plans mainly aimed at biodiversity conservation have been formulated.

[Initiatives by the private sector]

- The fishermen of Kesenuma established the Society Longing for Forests of Oysters (currently the NPO called Forests are Lovers of the Sea), and started making efforts to address water quality degradation and damage to fisheries (Forests Are Lovers of the Sea Campaign), including afforestation in Murone Village, Iwate Prefecture (currently, Muronecho, Ichinoseki City), which is located upstream of the Ohkawa River.

3. Details

(1) Overview

Fishermen who had a sense of urgency about the water quality degradation in Kesenuma Bay, damage to fisheries and further aggravation of the situation if the Niitsuki Dam construction plan was realized, established the Society Longing for Forests of Oysters, and started making efforts (Forests Are Lovers of the Sea Campaign), including afforestation in Murone Village, Iwate Prefecture, which is located upstream of the Ohkawa River.

Location	Basin of the Ohkawa River (Kesenuma City, Miyagi Prefecture, and Muronecho, Ichinoseki City, Iwate Prefecture)
Involved Parties	<p>[Implementing body]</p> <ul style="list-style-type: none"> • Nonprofit organization, Forests Are Lovers of the Sea (formerly the Society Longing for Forests of Oysters) <p>[Participants and cooperators]</p> <ul style="list-style-type: none"> • Involved Parties of Kesenuma Bay (fishermen, local residents, etc.) • Involved Parties of Muronecho, Ichinoseki City (12th ward residents' association of Muronecho, Ichinoseki Municipal Government, local residents, etc.) • Members and participants in tree-planting activities around the country
Background and history	<p>* <i>For details of the background to and circumstances before starting activities, refer to "2-2) Problems Associated with the Use and Management of Natural Resources and their Impact on Biodiversity."</i></p> <ul style="list-style-type: none"> • 1989: Society Longing for Forests of Oysters was established, mainly by fishermen in Kesenuma. • Same year: The first tree-planting ceremony was held at Mt. Murone in Murone Village, Iwate Prefecture (currently: Muronecho, Ichinoseki). Since then, tree-planting ceremonies have been held once a year: at Mt. Murone up to the third year and in Hikobae no Mori at Mt. Yagoshi in Murone Village in and after the fourth year. • 1990: Environmental education for children started. • 2009: In response to social needs for activities, which have been growing every year, the organization was modified to be NPO Forests Are Lovers of the Sea, aimed at making a fresh start and having new developments in the next generation.
Purpose and objectives	<ul style="list-style-type: none"> • To raise awareness for conserving the natural environment by promoting understanding for the forest-river-sea relationship through tree planting upstream of the Ohkawa River and environmental education for children ("Planting trees in human minds"). • To strive to improve the integrated natural environment in the basin and along the coast through activities to plant and foster trees in the upper river regions, taking into account the forest-river-sea relationship.

Main contents	<p>[Tree-planting ceremonies at Mt. Murone and Mt. Yagoshi in the upper reaches of the Ohkawa River]</p> <ul style="list-style-type: none"> • The NPO is engaged in activities to plant and foster trees in order to foster forests and enrich the sea. It is also establishing places for activities to deepen knowledge of and understanding for the connection between forests and the sea through forest-planting projects. <p>[Nature experience study and nature school]</p> <ul style="list-style-type: none"> • The NPO holds nature experience study sessions and nature schools under the theme of relations between forests, the sea, and people, where anyone from children to adults can study while enjoying nature. <p>[Conservation of natural environment]</p> <ul style="list-style-type: none"> • The NPO aims to comprehensively conserve the natural environment through use and utilization of natural energy and practice of agricultural life, in addition to conserving plants and animals based on various natural environment surveys.
Main achievements	<ul style="list-style-type: none"> • A total of 30,000 deciduous broad-leaved trees have been planted at Mt. Murone and Mt. Yagoshi. • The total number of participants in environmental education for children has topped 10,000. • Encouraged by the Forests Are Lovers of the Sea Campaign, tree-planting in upper river regions by fishermen is getting active both at home and abroad.

(2) Details of the Use and Management of Natural Resources from the “Five Perspectives” of the Satoyama Initiative

The table below shows the primary relevance of this case to the five perspectives.

Details are given below the table for the perspectives which have high relevance (items with the “◎” mark in the table).

Five Perspectives	Relevance to this Case	
	Degree of Relevance	Summary of Relevance
1) Resource use within the carrying capacity and resilience of the environment	◎	<ul style="list-style-type: none"> The NPO increased the persuasive ability and degree of appeal concerning the campaign by carrying out endorsement and quantitative evaluation based on scientific knowledge concerning the forest-river-sea relationship that had been known empirically. It plants seedlings of native species of the region, with a view to fostering deciduous broad-leaved forests. <p><i>* Details to follow.</i></p>
2) Cyclic use of natural resources	○	(Nothing in particular)
3) Recognition of the value and importance of local traditions and cultures	○	(Nothing in particular)
4) Natural resource management by various participating and cooperating entities	◎	<ul style="list-style-type: none"> Tree planting at Mt. Murone and Mt. Yagoshi was realized by focusing on the relationship between Kesenuma Bay and Murone Village from olden times and working on Murone Village . The NPO is proceeding with negotiations with the Involved Parties concerned, with a view to improving satoyama forests along a tributary of the Kitakami River, which is upstream of the producing center of seed oysters in Kesenuma Bay. <p><i>* Details to follow.</i></p>
5) Contributions to local socio-economics	◎	<ul style="list-style-type: none"> The Forests Are Lovers of the Sea Campaign, which has been taken up in textbooks for elementary and junior high school students, is widely known both at home and abroad, encouraging efforts to be made in various places. The NPO is focusing on environmental education in fields for school children and junior high school students. More than 10,000 children have visited such fields. <p><i>* Details to follow.</i></p>

1) Resource use within the carrying capacity and resilience of the environment

[Scientific clarification of the relationship between the sea and forests]

- Relations between upstream forests and fishery production along the coast have been known empirically around the country. Fishermen working in Kesenuma Bay understood that fish and seashells do not grow well when there is little snow or rain.
- When starting the Forests Are Lovers of the Sea Campaign, Mr. Hatakeyama, who was the originator, wanted

to find a way to scientifically prove such empirical knowledge. He sounded experts in various fields such as the fields of fishery, agriculture, forestry, and ecology. However, he found hardly any research cases that covered forests, rivers, and sea areas.

- Under such circumstances, Mr. Hatakeyama found research of Professor Katsuhiko Matsunaga of the School of Fisheries Sciences of Hokkaido University (currently contract professor of Yokkaichi University). From the research of Professor Matsunaga, he found the importance of upstream forests (in particular, broad-leaved forests rich in humus) when talking about the affluence of coastal regions, since there exists a forest-river-sea relationship through iron. In this relationship, fulvic acid iron, formed by humus in forests dissolves in rainwater and is carried to coastal regions through rivers. Phytoplankton grows by taking in this fulvic acid iron, resulting in the formation of rich ecosystems in coastal zones.
- Mr. Hatakeyama asked Professor Matsunaga to conduct research on the relationship between biological production in Kesenuma Bay and the Ohkawa River from 1993, when the Forests Are Lovers of the Sea Campaign was inaugurated, to the following year. The results of the research made it clear that of the annual catch in Kesenuma Bay, totaling 2 billion yen, approximately 1.8 billion yen comes from nutrition of the Ohkawa River.
- Since a mechanism was clarified and evaluated based on such scientific knowledge, the persuasive ability and degree of appeal concerning planting trees in upper river regions grew, which served as the basis for the continuation and expansion of activities thereafter.

[Fostering of deciduous broad-leaved forests based on forest-river-sea relationship]

- The tree-planting event conducted in 2009 marked the 21st such event held under the Forests Are Lovers of the Sea Campaign. A total of 30,000 trees have been planted at Mt. Murone and Mt. Yagoshi in Muronecho, Ichinoseki.
- Based on the aforementioned scientific knowledge concerning forest-river-sea relationship through iron, the NPO has planted native deciduous broad-leaved trees that grow naturally in the basin of the Ohkawa River, including Japanese beech, konara oak, *Quercus crispula*, katsura trees, Japanese horse chestnut, Japanese rowan, and maple, aimed at fostering deciduous broad-leaved forests that form rich humus.

4) Natural resource management by various participating and cooperating entities

[Establishment of relationship between fishermen in lower river regions and forest owners in upper river regions]

- Murone Shrine, located in the upper stream region of the Ohkawa River, has long been the subject of prayers for safe sailing among fishermen working in Kesenuma Bay. This tradition has been passed down through the generations. Rice porridge and salt, which are used in the grand festival of Murone Shrine, held once every four years, are still dedicated by Kesenuma.
- Prior to planting trees in the upper river region, the NPO collected opinions from Murone Village (currently: Muronecho, Ichinoseki) and it was decided that Murone Village would offer the forests it owned as a place for planting trees.
- After that, tree planting was also conducted at Mt. Yagoshi, which is also located in Murone Village. Mt. Yagoshi has been the main place for tree planting since the fourth year.

[New move toward activities to improve satoyama in a tributary of the Kitakami River]

- Since continuous management after afforestation is important for fostering healthy forests, the NPO is currently negotiating with the municipal government of Ichinoseki, which owns forests, so that maintenance and management activities for trees planted at Mt. Murone and Mt. Yagoshi could also be carried out by the NPO.
- On the other hand, the members said they want to engage in not only tree planting but also activities useful for environmental conservation, through their own physical efforts. In response to this request, the NPO started finding fields where forest management activities can be conducted, and found some candidate land in a tributary of the Kitakami River through the good offices of Miyagi Prefecture.
- Being the largest growing center of seed oysters for culture in Japan, the mouth of the Kitakami River has a strong connection with oyster culture in Kesenuma Bay. Against this backdrop, efforts for creating forests in a tributary of the Kitakami River will lead to the protection of seed oyster resources, which in turn favorably affect not only oyster production in Kesenuma Bay but also fishery communities all over Japan by ensuring long-term sustainability and development of oyster operation.
- Decision was made to begin a monthly forest improvement activity in satoyama forests along a tributary of the Kitakami River from April 2010. It is hoped to expand the activity through out the Kitakami River Basin. This conservation activity started with Ohkawa River of Kesenuma Bay is about to expand with the new activity on Kitakami River, the largest river in the northeastern region of the Mainland of Japan. Another cross-regional forest-river-sea relationship is about to be established.



Pictures: Tree-planting ceremony conducted with big-catch flags fluttering
(Photos provided by NPO corporation Forests Are Lovers of the Sea)

5) Contributions to local socio-economics

[Mindset reform through “planting trees in human minds”]

- Tree-planting activities by the Forests Are Lovers of the Sea Campaign will not produce fruits immediately, since they cover only a small part of vast basin area of the Ohkawa River and forests take a long time to grow.
- Against this backdrop, importance is placed on expanding the activities to initiatives by more people and organizations by “planting trees in human minds” through tree-planting activities, rather than just seeking for direct effects.
- The Forests Are Lovers of the Sea Campaign has been described in textbooks for elementary school and junior high school students, and are widely known now both at home and abroad. Not only local residents but also people from around the country, including those in the Sendai and Tokyo area, take part in tree-planting events.
- Encouraged by the Forests Are Lovers of the Sea Campaign, people started planting trees both in Japan and overseas, including Tanzania.

[Environmental education for children who will be the next generation]

- The basin of the Ohkawa River is still rich in nature. However, since the number of opportunities for children to come in contact with nature is decreasing year after year, the NPO thought that environmental education for children who will be the next generation is vital for the continuation and expansion of the Forests Are Lovers of the Sea Campaign.
- Therefore, the NPO has been providing programs since 1990, the year after the tree-planting started, by inviting school children and junior high school students to fields such as oyster farms and places where trees were planted.
- The NPO accepted 437 children from 16 schools in 2009. The total number of participants topped 10,000.



Picture: Scene of environmental education for children
(Photo provided by NPO corporation Forests Are Lovers of the Sea)

End