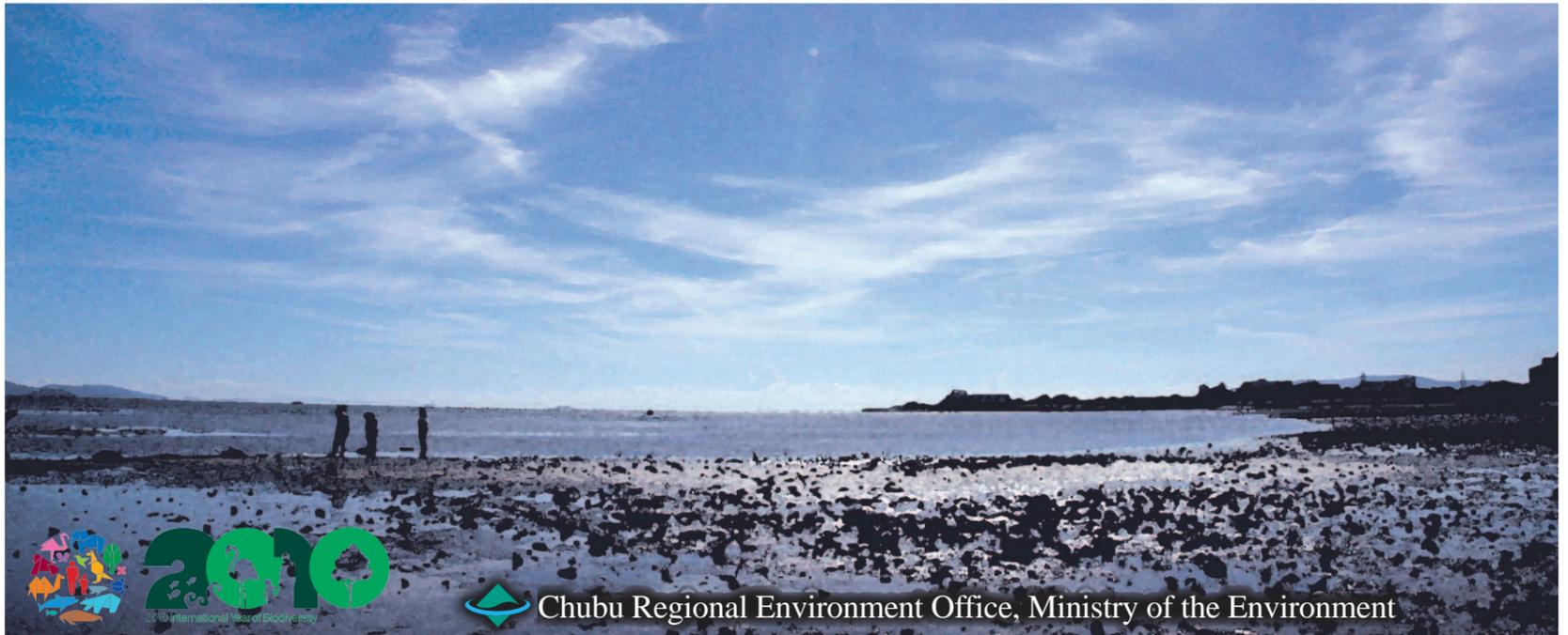




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A strategic vision for the conservation and sustainable use of biodiversity in Ise Miakawa Bay watershed involving local people and communities (Outline)



**A strategic vision for the conservation and sustainable use of biodiversity in Ise Miakawa Bay watershed involving local people and communities**

**(Outline)**

Contents

1. Why vision is formulated.....1

2. Target area and population for the study.....1

3. History of Ise Mikawa Bay watershed.....2

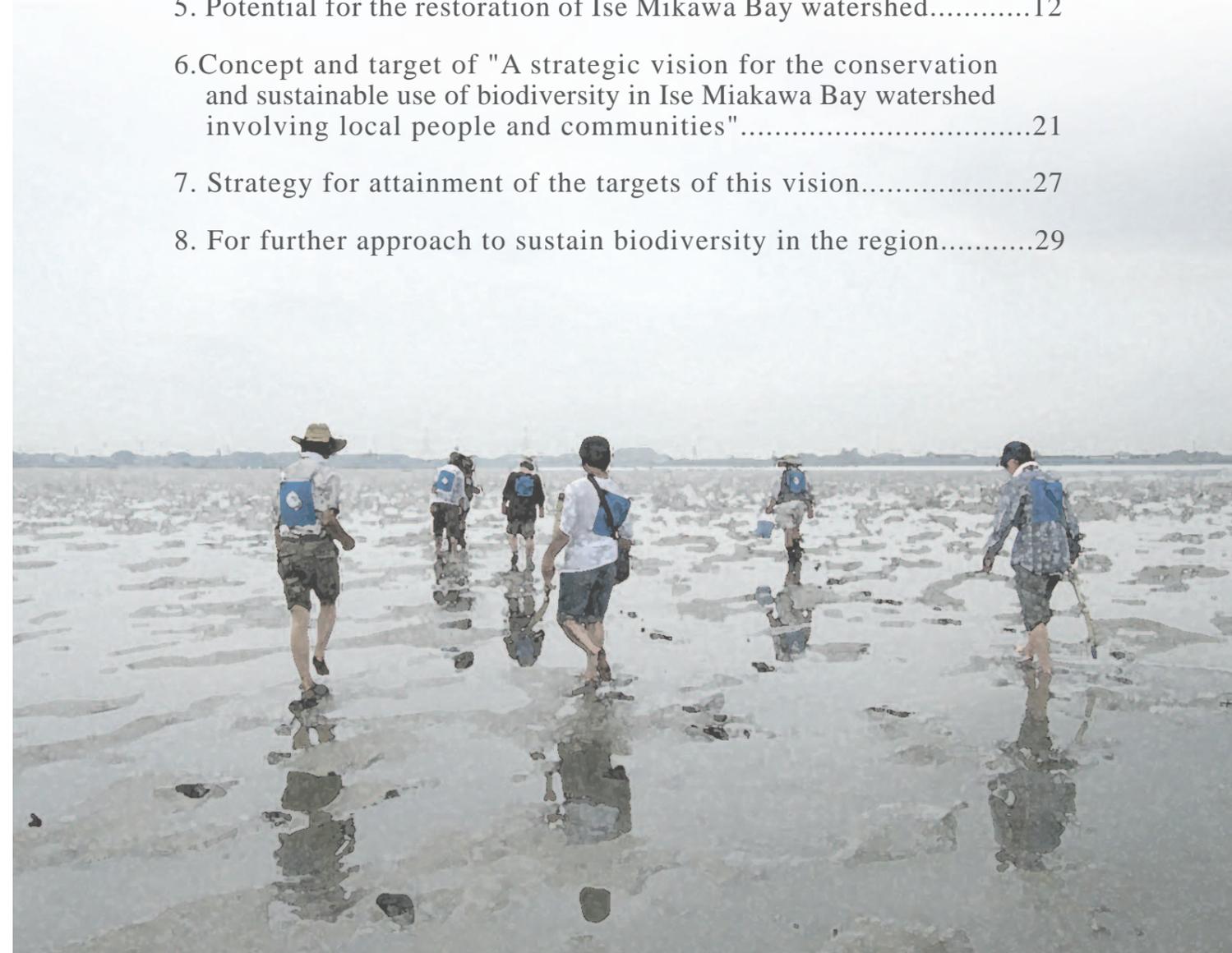
4. Current status and issues in Ise Mikawa Bay watershed.....4

5. Potential for the restoration of Ise Mikawa Bay watershed.....12

6. Concept and target of "A strategic vision for the conservation and sustainable use of biodiversity in Ise Miakawa Bay watershed involving local people and communities" .....21

7. Strategy for attainment of the targets of this vision.....27

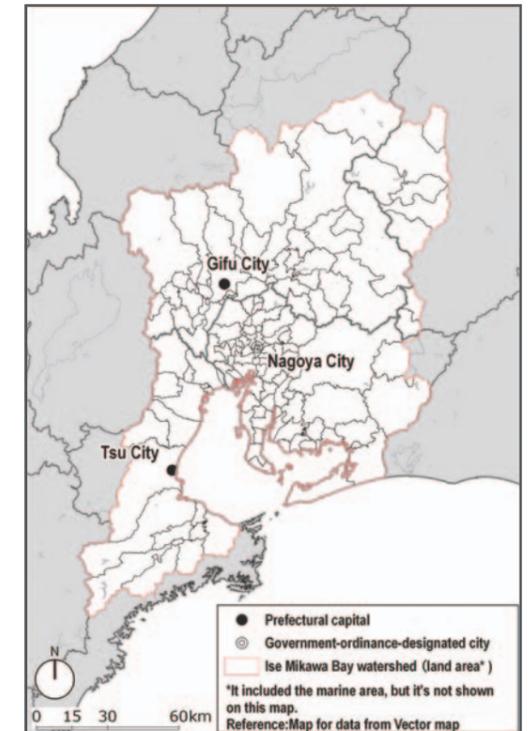
8. For further approach to sustain biodiversity in the region.....29



## 1. Why vision is formulated

The 10th meeting of the Conference of the Parties to the Convention on Biodiversity (COP10) is going to be held in Nagoya, Aichi in October, 2010. In the Chubu region, before the COP10, many various groups are working on the conservation and sustainable use of biodiversity. However, in this region, there are some issues which should be resolved for the conservation of biodiversity, such as shrinking green areas due to urban expansion, deserted satoyama, the expansion of abandoned artificial forests, the fragmentation of ecosystem, the deterioration of water quality in the closed water areas (the generation of red tide and blue tide), and shrinking tidal flats. To overcome these issues, we believe that the cooperation and relationships among local people and communities should be widely promoted. Although the Convention on Biological Diversity declares the following three purposes: 1. The conservation of biological diversity, 2. The sustainable use of the components of biological diversity, 3. The fair and equitable benefit sharing of the benefits arising out of the utilization of genetic resources, for the purpose of this outline, we will concentrate on the 1st and the 2nd points.

This vision, sustainable region plan from the view of biodiversity which is one of the Social Overhead Capital, is formulated to promote the activities of each group for biodiversity conservation and its sustainable use and contribute to resolve the issues for Ise Mikawa Bay watershed<sup>1</sup> (included sea area).



Graphic 1: Area map

## 2. Target area and population for the study

In this study, the targets are 65 cities, 56 towns, and 7 villages which belong to ten river systems<sup>2</sup> of Ise Mikawa Bay watershed in Gifu, Aichi, Mie, and Nagano Prefectures. The total area is about 15,868km<sup>2</sup> and the population is 11,044,082 people<sup>3</sup>.

Table 1: Population and surface

	Population	Surface(km <sup>2</sup> )
Nagano pref. (3 towns, 5 villages)	35,764	1,852
Gifu pref. (20 cities, 19 towns, 1 village)	2,076,341	6,311
Aichi pref. (35 cities, 23 towns, 1 village)	7,248,840	4,260
Mie pref. (10 cities, 11 towns)	1,683,137	3,446
<b>Total (65 cities, 56 towns, 7 villages)</b>	<b>11,044,082</b>	<b>15,868</b>

Note: Population : as of Oct.1, 2005, Surface : as of Oct.1, 2007

As for the population of 4 cities, 2 towns, and 1 village, all populations were counted although only a part of areas belongs to this watershed. (Footnote 1)

Reference: "Social life statistical indicator - Prefectural indicator" by Statistic Bureau, Ministry of Internal Affairs and Communications

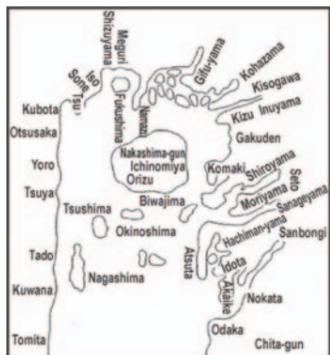
<sup>1</sup> Ise Mikawa Bay Watershed indicates the area of Ise and Mikawa Bay and river basins which flow into Ise and Mikawa Bay, but the picture includes not only geographic location but also the material cycle and ecosystem of this area.

<sup>2</sup> Toyogawa, Yahagi, Shonai, Kiso (Kiso, Nagara, Ibi), Suzuka, Kumoza, Kushida, Miyagawa

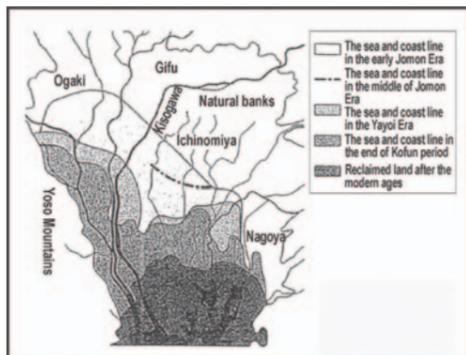
<sup>3</sup> As for Hiratani village in Nagano, Takayama city, Gujo city in Gifu, Shinshiro city, Shitara town in Aichi, Tsu city, Taiki town in Mie, only a part of the areas are included in the watershed. Therefore, the area surfaces were counted correctly, but the population includes entire village, towns, and cities.

### 3. History of Ise Mikawa Bay watershed

According to "Map of Ancient OWARI" (AD 717), the ancient coastline in Ise Mikawa watershed, especially the Nobi plain, was located at the line connecting the position of present Kuwana, Ogaki, Gifu, Inuyama, Komaki, and Midori Ward in Nagoya city and the most of the part of Nobi plain including Nagoya city was covered by the sea.



Graphic 2: Map of ancient OWARI



Graphic 3: Presumed coast line in each age of the Nobi plain

Reference: "The science of land architecture, how did Japanese people make their national land?" by Atsushi Ueda, Yoshio Nakamura, Tadahiko Higuchi Chapter 11 "Buddha made Waju, God protected people" by Atsuko Tanaka

In the Jomon Era, it is thought that people were living in the plateau face to the sea, in the edge of forest and around rivers running through hilly area, and hunting and fishing to live. In the Yayoi Era, we can presume from the distribution of ruins that people settled down at the foot of mountains next to plains or on the river banks, which doesn't exist today, and started wet-rice cultivation in the alluvial area. In the middle of the Yayoi Era, the wet-rice cultivation became stable due to the improvement of technology and in steps, the cultivated land has expanded<sup>4</sup>.

From the Middle ages to early modern ages, after main roads and sea transport were prepared, Nagoya castle town developed as commercial city and industrial cities developed rapidly around the castle town. Along "Tokaido" and other roads, accommodations (Hatago), cheap accommodations (Kichin-yado), tea houses and retail stores were built and it developed as post town.

On the other hand, in the downstream river-basin areas and coastal areas, new field was actively developed.

The downstream basin of the Kiso three rivers is widely known as a region where embankments "waju", which surrounded settlements and cultivated land like a ring to protect from flood damage, were built. The embankments were built in Gifu, Ogaki, Hashima cities, and the west area of Nagoya city. At the beginning of the Meiji Era, about 80 embankments were formed in a vast inverted triangle area which stretched approx. 50km from north to south and 20km from east to west.<sup>5</sup> In the embankment areas, because of the development of new field, flood control basins and river channels were getting narrow. As a result, the more developed areas increased, the more flood damages happened. It was exactly a fight with water, and to stop this vicious circle, the systems of the flood control were organized.

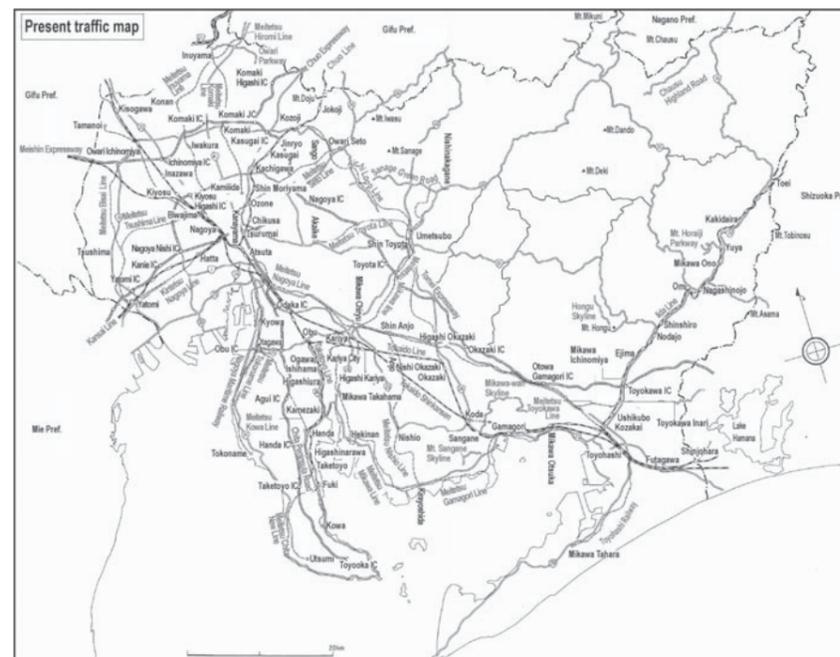
In the coastal areas, reclamation was actively done. Atsuta, Minato, Nakagawa Wards, a part of Minami Ward in Nagoya city, Yatomi town, Jushiya village, Tobishima village in Aichi Prefecture, and Kisozaki town in Mie Prefecture were all formed by the land reclamation in the Edo Era. The land reclamation area went up to about 5,000ha.



Graphic 4: Reclamation of Yahagi river downstream area

Reference: "Fudoki 23rd, People and their knowledge in hometown, Aichi" by Rural culture association

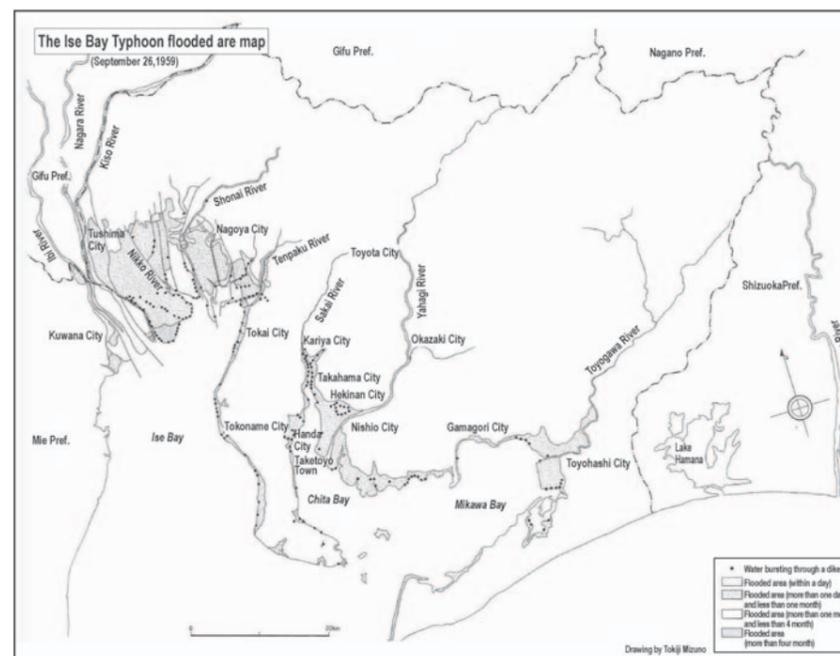
In the modern age, the development of railway and road traffic was promoted and it brought the development of manufacturing industry including automobile. As a result, metropolitan area was formed around Nagoya. In the East Mikawa region, manufacturing industry was developing as there was designated as special area for industrial consolidation in 1964, which was based on Act for Promoting Development of Special Areas for Industrial Consolidation. In addition, the land development was also promoted due to this industry development.



Graphic 5: Present main traffic map (Aichi Prefecture)

Reference: "Kadokawa dictionary of place names in Japan, 23 Aichi" by Kadokawa dictionary of place names in Japan edition committee

On the other hand, because of overcrowded residential quarter in a vast flood-prone low-lying area, this region is susceptible to high tide and floods. In September, 1959, the damage from the Ise Bay typhoon exceeded 4,000 dead, and the disaster prevention of the coast became an important measure.



Graphic 6: The Ise Bay typhoon flooded area map

Reference: "Kadokawa dictionary of place names in Japan, 23 Aichi" by Kadokawa dictionary of place names in Japan edition committee

4 "Japanese topography the 9th volume, Chubu region, Niigata Prefecture" by Japanese topography research center, published by Ninomiya shoten, 1972

5 Reference: "The science of land architecture, how did Japanese people make their national land?" by Atsushi Ueda, Yoshio Nakamura, Tadahiko Higuchi

## 4. Current status and issues in Ise Mikawa Bay watershed

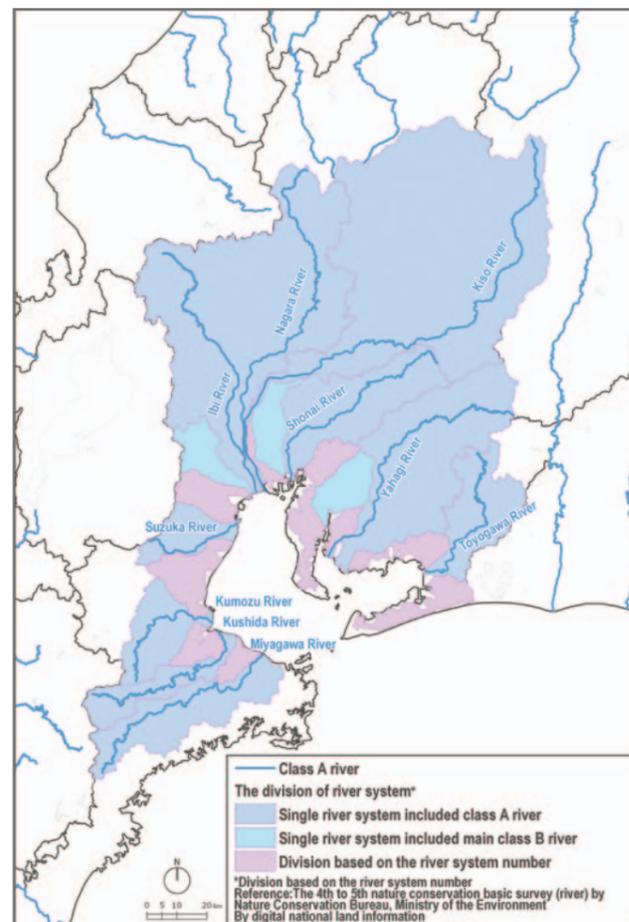
### (1) Current status in Ise Mikawa watershed

This region can be roughly divided into ten river systems. The river system which has the widest and the most populous basin area is the Kiso River system (9,100 km<sup>2</sup>). The population around the Kiso, Nagara and Ibi Rivers is 3.36 million people.

Table 2: Class A rivers (Gifu, Aichi, and Mie Prefectures)

River system name	River length(km)	River-basin area (km <sup>2</sup> )	Population (ten thousand)	Year average flow (m <sup>3</sup> /s)
Toyogawa	77	724	21	30.7
Yahagi	118	1,830	71	38
Shonai	96	1,010	250	30.9
Kiso (the Kiso River)	229	5,275	193	297.8
Kiso (the Nagara River)	166	1,985	83	223.3
Kiso (the Ibi River)	121	1,840	60	118.7
Suzuka	38	323	12	14.4
Kumozu	55	550	9	28.5
Kushida	87	436	4	33.9
Miyagawa	91	920	14	74.4

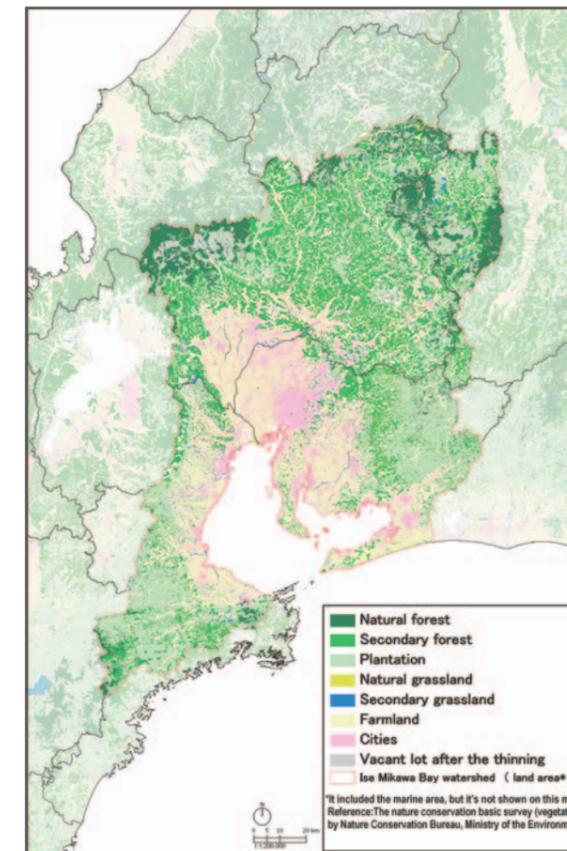
The population is based on the census in 2002. (Regarding the Nagara and Ibi rivers based on the research in 1995)  
Reference: River bureau, Ministry of Land, Infrastructure, Transport, Tourism



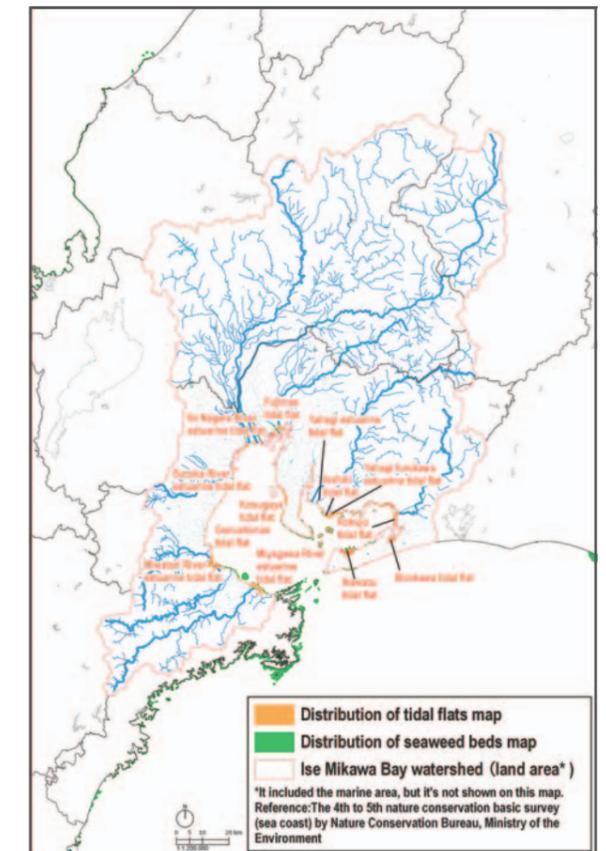
Graphic 7: Main river-basin area

When the natural environment in this region is divided into natural forests, secondary forests, plantations, natural grasslands, secondary grasslands, farmlands and urban areas, plantations account for the largest area about 32.3%, after that, secondary forests account for about 23.3%, farmlands account for about 19.6%, and urban areas account for about 12.3%.

In Ise Mikawa Bay, there are a lot of various living things living and growing because of the wide neritic areas where sunlight reaches, the sands, the tidal flats, the rock, the seaweed beds, and the brackish water areas where the fresh water with nutritive salt from continental areas mixes with seawater.



Graphic 8: Classification of the characteristics of natural environment



Graphic 9: Distribution of tidal flats and seaweed beds

For large-scale protection of this region's natural environment, a total of 32 areas have been designated natural parks, this includes 3 areas in national parks, 6 areas in quasi-national parks and 23 areas in prefectural natural parks, so these parks cover 411 thousand hectares which is 25.9% of the basin area.

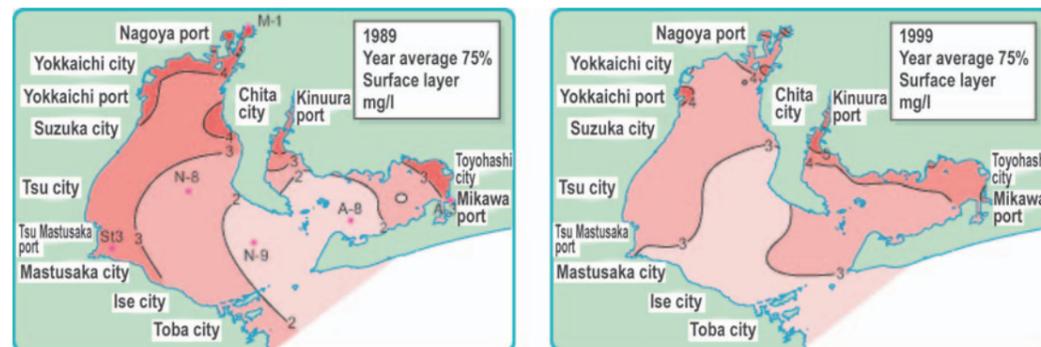
Fujimae tidal flat in Aichi Prefecture has been registered in Ramsar Convention as one of the most famous landing zone of migratory birds in Japan in November, 2002. In addition, among the "500 Important Wetlands" announced in December, 2001, 14 areas were selected in Gifu, Aichi, and Mie Prefectures.

**(2) Progress of various businesses and urbanization promoted during the period of high economic growth and increase of environmental burdens**

**1) Current status and water quality of Ise Mikawa Bay**

Ise Mikawa Bay has shallow average water depth compared to Tokyo Bay and Osaka Bay and the center marine area is shaped like basin. The coast shape is complicated because of big and small islands at the mouth. Therefore, the water exchange between the inside of the bay and the open sea is difficult and the materials which cause pollution can easily stagnate. As a result, the influence of the fresh water flown from rivers is getting more serious.

In 1979, the total volume control of Chemical Oxygen Demand (COD) was introduced. Although the COD density level in Ise Mikawa Bay (average 75%) was improved from 1989 to 1999, it is still high in the closed-off section of the bay.



Graphic 10: COD density distribution map in Ise Mikawa Bay (●: check point)

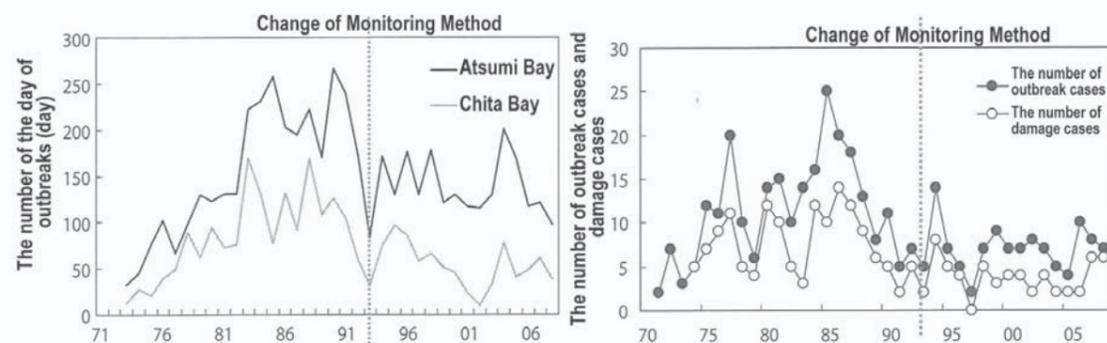
Reference: Port and Airport Department, Chubu Regional Bureau, Ministry of Land and Infrastructure and Transport: Ise Bay environment data base

**2) Outbreak of red tide and blue tide**

In the semi-closed water area like Ise Mikawa Bay, especially in Summer, the phytoplankton growth accelerates because of the elution of nutrient salt from saline mad and high water temperature, but zooplankton's food consumption is relatively reduced and it causes chronic outbreak of red tide, oxygen-deficient water mass and blue tide.

Due to this oxygen-deficient water mass, wildlife communities and seabed communities had serious influence and it causes also fishery damages. Regarding blue tide, for long-term process, it's similar to red tide and the number of outbreak after 1990 seems to remain on the same level.

About the outbreak of red tide and blue tide and the influence to shellfish and other living things in Ise Mikawa Bay, the information sharing with local people including the publication of mass media such as newspapers is required.

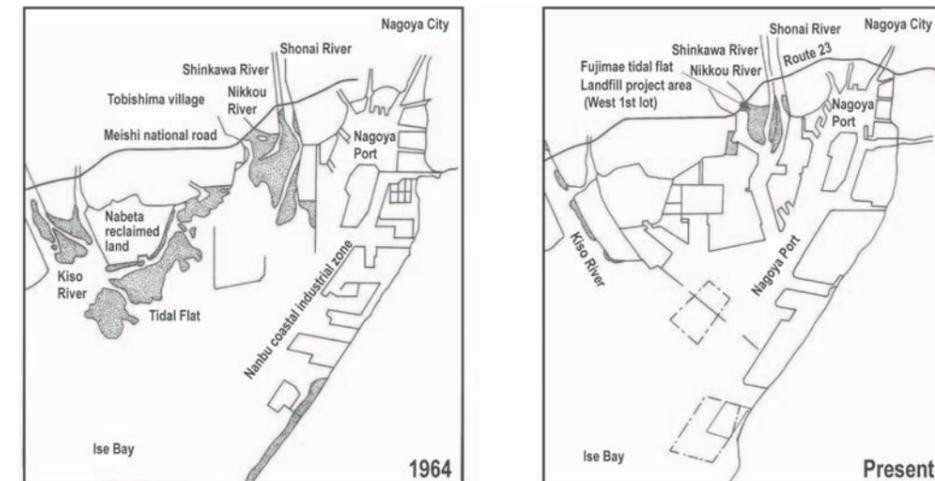


Graphic 11: Transition of the total number of the day of outbreaks of red tide(left) and blue tide (right) in Mikawa Bay

Reference: The status and measures of the oxygen-deficient water mass at the bottom of Ise Bay (2009), measures for resource environment 45 (9) p36-42 by Motoo Ishida, Teruaki Suzuki

**3) Loss of tidal flats, seaweed beds and natural coasts**

From the view of the transition of tidal flat areas in Ise Mikawa Bay, the tidal flats in 1945 were about 5,600ha, but it had rapidly shrunk by 1970 and became about the half size for 25 years after 1945. Moreover, most of tidal flats around the mouth of the Kiso River and the Shonai River have disappeared except Fujimae tidal flat.



Graphic 12: Transition of Fujimae tidal flat area

Reference: "Natural protection dictionary 2 (Sea)" (1995) by Natural Protection Association

As for the seaweed beds' transition, the total area of Ise Bay was about 11,400ha in 1955, but it shrank to 1/100th of the size over 40 years.

On the other hand, the length of natural coasts in Ise Mikawa Bay is 111.0km which is the 13.5% of the total length of sea coast, and the change rate of natural coasts from 1978 to 1996 is -10.9% in Ise Bay and -17.8% in Mikawa Bay.

**4) Current status of marine litters and driftwoods**

In Ise Mikawa Bay, marine litters in the sea and coastal areas deteriorate the sea area environment. When overflows of rivers happen like typhoon, many litters arrive to the sea and it causes the problems of small boats' navigation and fishery.

**5) Flood-prone low-lying area and effect of global warming**

In Ise Bay area, the biggest flood-prone low-lying area in Japan, where the land becomes below sea level in the time of high tide, spreads out and had significant damage in the coastal area by the typhoon no.13 in 1953 and the Ise Bay Typhoon in 1959.

According to the 3rd report of Intergovernmental Panel on Climate Change (IPCC) in 2001, from then, with the advance of global warming, it's predicted that the sea will rise by 9 to 88cm by 2100 and in the 4th report (2007), it will rise at least 18 to 59 cm. Therefore, the effect of the sea level elevation on the flood-prone low-lying area is concerned.

**6) Fish catches' loss**

The catch in Ise Mikawa Bay is recently shrinking and in Aichi Prefecture, it's been shrinking since 1980 and the catch in 2004 was about 590 thousand tons which is less than half of the 1980's catch. In Mie Prefecture (Ise Bay area), it has been shrinking since 1985 and the catch in 2004 was about 850 thousand tons.

7) Current status of land use and the change

The forests and grasslands account for 65.8% (about 1.18 millions ha) of the total Ise Miakwa Bay watershed's land area, and farmlands (the total of rice field and other farmlands) account for 14.9% (about 0.27 million ha).

However, the changeover area of forests from 1990 to 2000 reached about 11,244ha and the highest percentage (39.4%) of the changeover into golf courses and leisure facilities is about 4,428ha, and the changeover into public land was about 2,799ha. As for the transition of the land use of 50km area around Nagoya, the changeover of farmland into urban area has been promoted and the landfill in the coastal area has developed.

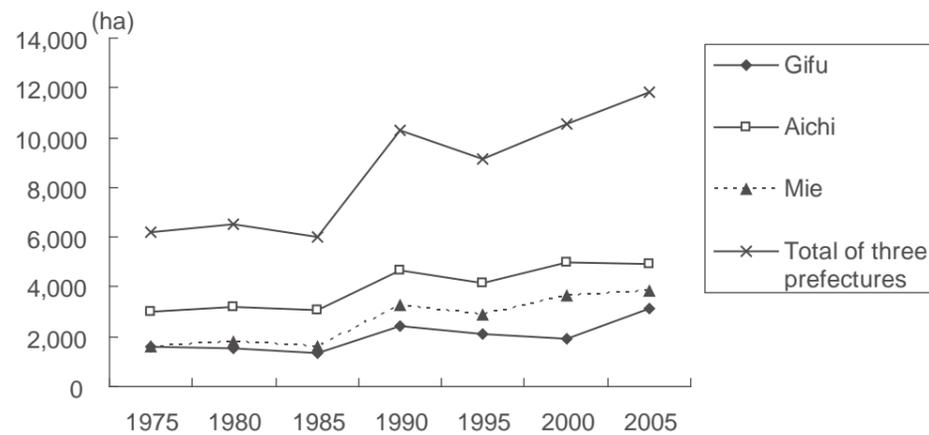
(3) Transformation of industrial and social structure due to aging population and low birthrate

1) Current status of forestry

According to the agriculture and forestry census in 2000, the percentage of age class, class over 9 (more than 41 years old tree) was higher than national average in private artificial forests of Ise Mikawa Bay watershed and there were lots of forests which should be done the thinning. In addition, the number of the forestry management bodies is 16,689 in this region, but 57.1% of them are under 10ha.

2) Transition of farmland area and the number of farming family

According to the agriculture and forestry census in 2005, the total number of farming families of this region (as for the 4 cities, 2 towns and 1 village of Nagano Prefecture was counted in all area) is 225,469 families. The transition of the number of farming families in entire Gifu, Aichi and Mie Prefectures shows that it has decreased 254,453 families for 50 year since 1955 until 2005. Moreover, in these three prefectures, cultivation abandoned land<sup>6</sup> has been increasing since 1990 and has increased 5,633ha for 30 years since 1975 until 2005. Regarding the distribution of "marginal hamlet"<sup>7</sup> in this region, we can find them in the mountain area located in the central part of Gifu Prefecture, the east part of Aichi Prefecture, and the south part of Mie Prefecture. The depopulated hamlets defined by the Law on Special Measures to Promote the Independence of Depopulated Areas spread in 27 municipalities of whole 128 municipalities, and the percentage of the area is 43.6% which is under the nationwide percentage 54.0%.



Graphic 13: Transition of cultivation abandoned area  
Reference: the agriculture and forestry census

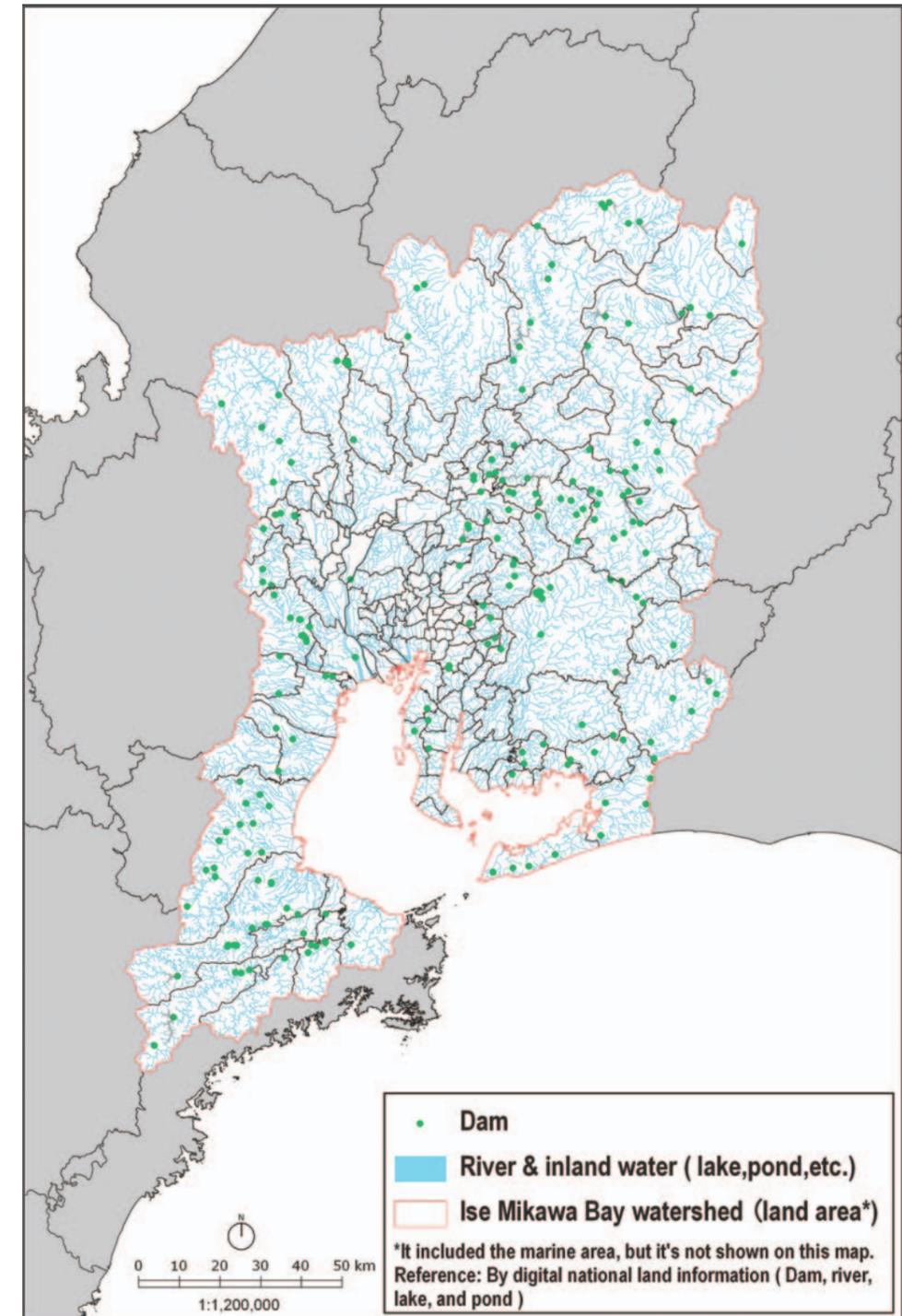
<sup>6</sup> This is the division by MAFF. The land which was not planted more than one year before the research and is not planed clearly for the future crops. On the other hand, if there is some plan for the future, it's considered in business.

<sup>7</sup> "The definition of marginal hamlet is the hamlet where the people age 65 account for more than half population and it's difficult to keep the community activities like marriage, funeral and other necessary maintenance for rice paddy and road." by Akira Ono, professor of Kitami Institute of Technology, emeritus professor of Kochi University, "Agriculture and Economy" March,2005 page-5, Showado

(4) The network status of forests, satoyama, rivers and the sea, and the habitat environment of living things

1) Current status of river system

Ise Mikawa Bay watershed consists of 10 large river systems including the Kiso, Toyogawa, Yahagi, and Suzuka River system etc.. To support a lot of population and industries, various social capitals were promoted and the dam which is the one of the social capital was constructed at 214 places<sup>8</sup>.



Graphic 14:Dams in the region

<sup>8</sup> By digital national land information

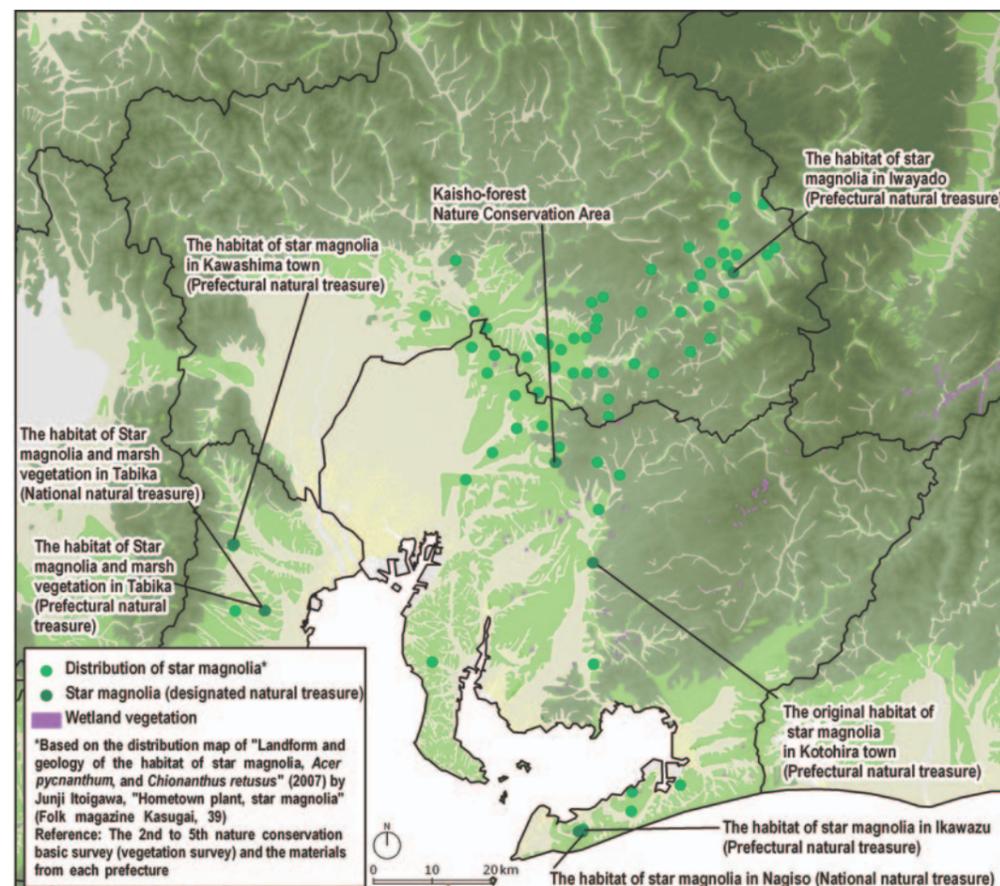
## 2) Change of the status of the habitats of wildlife

As a result of comparison between the Second National Survey on the Natural Environment conducted in 1978 and the Sixth National Survey conducted in 2003, it's presumed that the distribution of the habitats of black bears and monkeys are moving from mountainous area to satoyama area which is close to urban area. Regarding the changes of the frequency of appearance of snipes and plovers in the main tidal flats, quite a few species of them are decreasing the number of appearance. The changes of farmland environment and forms of agriculture are raised as a part of the causes.

On the other hand, regarding the loggerhead turtle which comes ashore and lay eggs in this region, most of cases are seen at the open sea side of Atsumi peninsula (Enshunada coast). Therefore this place is considered as one of the main egg-laying places in Japan.

In the hill areas of Tokai region, endemic species such as star magnolia, *Acer pycnanthum*, and *Chionanthus retusus* can be found and they were named "plant communities which have special elements around Ise Bay" by Kazuo Inami and also named "Tokai hilly land elements" by Ueda.

Among the plants of Tokai hilly elements, star magnolia could be related to Tokai layer group, especially to Toki sand gravel layer. The thick pot clay layer forms spring-fed wetland, and it produces the stable temperature area which is appropriate habitat environment for star magnolia. As for *Eriocaulon nuadicuspe*, which grows naturally in the wetlands of satoyama areas, it was a common plant in Tokai region, but the habitat has been rapidly shrinking, so it's designated endangered species Category II. Regarding the distribution of *Eriocaulon nuadicuspe*, it's been followed up by a researcher Tomita and his group of Nagoya University since 2004 until 2005 and in 2009. The samples were collected at the 47 habitats in Aichi where the samples had been collected in the 1990's. As a result, in the first research, the extinction of *Eriocaulon nuadicuspe* has been found at 16 sites, indicating 34% of the habitats where they had collected sample. In the second research conducted in 2009, it was found only one site where *Eriocaulon nuadicuspe* had been extinct. The continuous conservation measure is required for *Eriocaulon nuadicuspe*.



Graphic 15: Distribution status of star magnolia

## 3) The status of threatened species and alien species

The number of threatened species listed on the red data book of each prefecture is as below. The number of the species which has been extinct, included Extinct in the Wild, is 145 species and threatened species, included near threatened species, are 2,988 species. In total, 3,133 species have been extinct or in the threatened situation.

Table 3: Red data book listed by each prefecture

	Book name	Published year (Revised year)	Objects	Number		
				Extinction	Threatened	Total
Gifu	Threatened species in Gifu	2007 (2009)	Animal	4	326	330
			Plant	0	189	189
Aichi	Red data book, Aichi	2001(2008)	Animal	22	501	523
			Plant, mushroom	43	614	657
Mie	Red data book, Mie,2005	2005	Animal	16	667	683
			Plant, mush room	36	764	800
Nagano	Red data book, Nagano	2001,2003,2004	Animal	13	410	423
			Plant, mushroom	34	949	983
Total			Animal	37	1155	1192
			Plant, mushroom	108	1833	1941

\*The total does not correspond with the total number of each prefecture due to the duplicate species.

Reference: Red data books of each prefecture

According to the research by Toyohashi Museum of Natural History, golden mussel, which could affect human society due to the massive outbreak in the water-conducting facilities and water utilities, is found at the 4 sites between Myougou and Asahata in Shinshiro city in the Uren River of the Toyogawa River system. In the bay, due to the appearance of the alien sea creatures, the disturbance of regional ecosystem and the damage to fishery including aquaculture industry, marine vessel, and water intake facilities in coastal industrial zone are concerned. Most of alien sea creatures are benthic animals, such as mollusk, shellfish, Polychaeta, and seaweeds, and most of them were carried and introduced by ballast water or adherence to ships.<sup>9</sup>

At the moment, the number of species presumed to have entered Japan due to adherence to ships is 20 species, and it includes the Mediterranean mussel (bivalve, marine mollusk) which is selected as "100 of the World's Worst Invasive Alien (International Union for Conservation of Nature and Natural Resources, 2000)" and the Mediterranean mussel which is selected as "100 of the Japan's Worst Invasive Alien (Ecological Society of Japan, 2002).

From now, the effect on biodiversity of land area and marine area by alien species should be studied including the ones which are not designated as invasive alien species.

## 4) The status of the damage to farm produce caused by wild beasts and birds

The transition of the damage to farm produce caused by wildlife in Gifu, Aichi and Mie Prefectures has been decreasing since 1999. On the other hand, the damage volume has been increasing in recent years and it didn't change much between 2007 (6,959 tons) and 2008 (6,597 tons). To use wildlife resources in the future, the comprehensive damage measures should be prepared, such as hunting system, administrative system for wildlife use, and the entire stream of wildlife use until the commercialization of products.

<sup>9</sup> By the documents of Japanese Association of Benthology

## 5. Potential for the restoration of Ise Mikawa Bay watershed

### (1) Approach to learn the current status of natural environment in Ise Mikawa Bay watershed

#### 1) Monitoring of Ise Mikawa Bay watershed

Aichi Fisheries Research Institute is collecting sea area information, such as water quality, biota, red tide, and oxygen-deficient water mass by the water quality research ship and automatic observation buoy and researching the environment of Ise Mikawa Bay in a comprehensive way. In addition, during the summer when the oxygen-deficient water mass develops, they are monitoring it every year.

Suzuka fisheries office, Mie Prefecture Fisheries Research Institute is monitoring the ocean environment at the fixed point in Ise Bay every month to know the short and long term's environment change, researching the movement of the oxygen-deficient water mass which gives significant impact to living things, and providing the information to the relevant authorities as a report of oxygen-deficient water mass.

#### 2) Biological research of sweetfish in the Yahagi River

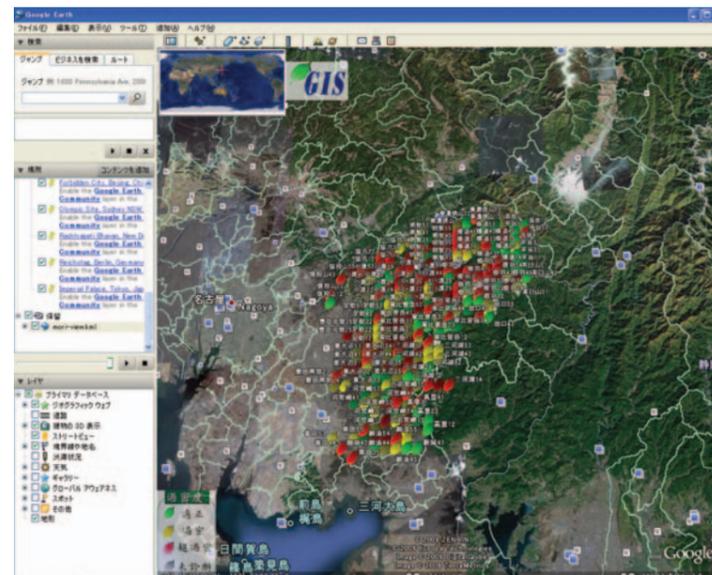
In the Yahagi River, the run and spawning of sweetfish have been monitored with the cooperation of Toyota Yahagi River Institute, Yahagi River natural sweetfish research group, and Yahagi River Fishery Cooperation Union.

On the basis of the result of habitat research, the activities based on the scientific knowledge, such as making appropriate spawning place and removing accumulated sand in dams, have been practiced by the cooperation of Yahagi River Fisheries cooperation Union, but there are still a lot of issues for the restoration and conservation of the aquatic resources.

#### 3) "Forest health check" by local people and researchers

In 2005, "the 1st Yahagi River forest health check" was held by local people, forest volunteers and researchers in the Yahagi upstream region. After this, the movement of forest health check spread across the whole country and it was conducted in 21 prefectures. The forest health check is an activity to check regional artificial forests scientifically and feel them with our five senses. The process of the check to collect the information of artificial forests is as follows: 1. Setting of research point, 2. Vegetation survey except planted trees in artificial forest and 3. Density research of planted trees. The health check of Yahagi River forest has set up "the foundation for Yahagi River forest health check by 1000 people" for the sustainable activity.

Activity report is released widely on public at debrief session, symposium, WEB-GIS, etc. and helps to explain the result to participants and forest volunteers. The collaboration among various groups is a key to enhance people's motivation and develop the activities.



Graphic 16:Transmission of the result of research by WEB-GIS (Yahagi River region)

Reference: Documents of forest health check

#### 4) "Sea health check" and learning opportunity by Ise-Mikawa Bay Bioregions Network

In Ise Mikawa Bay watershed, to conserve and restore the environment and the life in harmony with nature, such as forests, satoyama, rivers and the sea, and the life with traditional culture and the landscape, individuals and groups have been developing the activities in each area. In February, 2003, "Event for the people who wish to get back the abundant Ise Bay" was held and the active groups and administrative bodies understood about the importance of the perspective of the whole Ise Mikawa Bay watershed and the collaboration among industry field, administrative bodies, school and people. After this, Ise-Mikawa Bay Bioregions Network was set up in January, 2005. To restore the nature in this region, they are organizing the collaborated activities among the groups for environment conservation and operating with industry field, administrative bodies, school, and people to build a network to take care of the linkage of nature among mountains, rivers, satoyama and the sea.

As the activities focused on the linkage of nature among mountains, rivers, satoyama, Ise-Mikawa Bay Bioregions Network is conducting research for the sea, satoyama, and rivers, holding seminar and symposium.

For the purpose of "Learning about our sea", "pre- sea health check" was held in Rokujo tidal flat in April, 2007. After this, "The first sea health check" was held in Fujimae tidal flat in August, 2007 and the participants were about 50 people.

The expected effects are the following three points: through the experiences of the contact with the sea, people notice the faced crisis and start interacting with other people who are interested in the environmental problems of the sea; through the experiences of the mutual understanding and the collaboration between fishers and people, people re-realize the cycle that fishers manage "fruit of the sea" which has the perfect cycle of ecosystem and distribute it in the sustainable way, then, people consume it with self-governing way.; children can feel "sense of wonder" and understand naturally the importance of nature from the contact with the sea.



Graphic 17:Sea health check

#### 5) The habitat research of loggerhead turtle and the formulation of the guideline

Loggerhead turtles were found in total 146 times on the Hii and Horikiri Beach, Akabane Beach, Toyohashi Beach, Kosai-Shirasuka Beach, and Arai Beach in 1999 and also the egg-laying was found in total 87 times. For the protection of loggerhead turtles, various groups of Aichi and Shizuoka Prefecture are working on.

From the study in the past, the egg-laying place of loggerhead turtle in the Pacific Ocean is only on the sand beach of Japan, and the turtles hatched in Japan are growing around Mexican offshore of California Peninsula for over 20 years and coming back to Japan to lay eggs. The collaboration and coordination among Japan and overseas are necessary for the conservation of loggerhead turtles.

## (2) Steps for the restoration of Ise Mikawa Bay watershed

### 1) Formulation of various plans for the restoration of Ise Mikawa Bay

"Action plan for the restoration of Ise Bay" was formulated in March 2007. The slogan is "restore healthy and lively Ise Bay through the restoration of ecosystem by people living in forest area, river area and the sea area and pass it down the subsequent generation" and the target is "the attainment of the environmental criteria and the restoration of beautiful, healthy, and lively Ise Bay where various living things live and people can enjoy safely".

In Mikawa Bay, "Action plan for the restoration of Mikawa Bay watershed" was formulated in March, 2008. The purpose was "a goal-setting to reply to nature-oriented people which uses the natural and social features in Mikawa Bay watershed and includes new relation among people, forests, rivers, and the sea, and also the promotion of the activities to achieve the goal". After having set up Mikawa Bay watershed meeting, the restoration of water cycle in the ecosystem was set as the target.

In the basic plan for the coastal conservation in Mikawa and Ise Bay formulated in March, 2003 and revised in August, 2008, the following three items were set as a basic policy for coastal conservation: 1. The item to protect the coasts, 2. The item to maintain and conserve the coastal environment, 3. The item for the proper use by the public. To realize the measures, the activities will be promoted after the allocation of the roles.

### 2) Improvement of water quality in the Shonai River

From the 1940's to 60's, the drainage water of ceramic material, glazed production, and paper mill and human sewage were draining into the Shonai River. As a result, it caused horrible white turbidity and organic pollution. However, the water quality improved a lot due to the extra setting of the effluent standard of Water Quality Pollution Control Act and the self-limitation of drainage, the development of sewage line, and the movement to get back the limpid stream and nature became active.

In Aichi Prefecture, the extra effluent standard was set by the regulation set the effluent standard based on the item 3 of the article 3 of Water Quality Pollution Control Act.

Oji paper Co., Ltd. entered in an "agreement on pollution prevention" with Kasugai city in 1970, and enacted "Environmental improvement control rules" and imposes their own self-restriction.

As for the pot clay and glazed production factories in Seto, the drain outlet of factories is clearly shown under the supervision of Aichi ceramic industry association from 1976 and the activities to restore the river from the white turbidity is developing.

### 3) Flood control technique "Kasumi embankment" in the Toyogawa River downstream region

In the Toyogawa River downstream region, discontinuous embankments "Kasumi embankment", which some part of embankment is open, were constructed. As this type of embankment guides the water to flood control basin area in case of flood, it worked to weaken the flow of water. When the Toyogawa River flood control channel was completed in 1965, unnecessary Kasumi embankments were partially destroyed, but it still exists in Ushikawa, Oomura, and Kamo in Toyohashi city, and Miyahara-cho in Toyokawa city. As Kasumi embankment helps not only for flood control but also fertile soil supply from upstream, it's been contributing to the biodiversity including the living things in wetland area. In Ushikawa flood control basin which is located downstream of the Toyogawa River and the Toyogawa River and the Asakura River which contact with the flood control basin, it was found 36 sorts of birds, 53 sorts of other animals, 167 sorts of seed plants and 179 sorts of other plants in the research from 1991 to 1992.<sup>10</sup> At the moment, the related autonomies to Kasumi embankment area are planning to reduce flood damage by the construction of small embankment, the regulation of land-use which limits building construction and detailed hazard map.

<sup>10</sup> "Japanese topography the 12th volume Aichi, Gifu Prefectures" by Japanese topography research center, published by Ninomiya shoten, 1969

<sup>11</sup> Research for the conservation of Kasumi embankment and the ecosystem of flood control basin: Ichino: (Report by the Nature Conservation Society of Japan, 1991)

### 4) Restoration of tidal flats and seaweed beds around coasts

In Mikawa Bay, from 1999 to 2004, the government and Aichi Prefecture implemented the development and sand covering of about 620ha (30 sites) of tidal flats and seaweed beds with using good quality dredge sand delivered from Nakayama water channel. The sand covering prevents the elution of polluted material in the sea and improves the water quality. The development of the tidal flats with good quality sand enhances natural purification by seaweeds. As a result, this project contributed to the creation of new habitats for living organisms, the restoration of the ecosystem in Mikawa Bay, and the fisheries promotion.

### 5) The setting of fishery right

There are small and large 67 fishing ports in Ise Bay, and the common fishery right (the right that the fishermen in the specific area use the specific fishing ground) area is set in the most of marine areas except Yokkaichi, Nagoya Kinuura, Mikawa ports, and the south side of Atsumi peninsula. As for the section fishery right (the right to cultivate aquatic plants and animal in the specific area) area, it is set in the marine areas from Suzuka to Toba city, and the southern part of Chita peninsula. These areas are set as a part of promotion for the sustainable fishery in this region.

### 6) Monitoring by satellite images

From April in 2007, Japan Aerospace Exploration Agency (JAXA) is receiving the observation data of Moderate Resolution Imaging Spectroradiometer (MODIS) carried on the earth observation satellite Terra and Aqua of the National Aeronautics and Space Administration (NASA). The 4th Regional Coast Guard Headquarters is providing the monitoring information of the marine area images which the Hydrographic and Oceanographic Department of Japan coast guard processed.

With using these images, the current status of chlorophyll a level which is a guide of the occurrence status of red tide, and other 6 items (sea surface temperature, chlorophyll a level, concerned material level, Chromophoric Dissolved Organic Matter, RGB images of sea surface radiance, RGB images of surface reflectance, K490 extinction coefficient) are shown on their website.

### 7) Promotion for the activities of water purification

#### a) Project plan for "The way to water cycle and material cycle system 2010"

As a part of "Promotion of domestic effluent measures" which is the midterm comprehensive plans of Nagano Prefecture, Nagano Prefecture plans to formulate the new domestic effluent facilities plan for the next generation (The way to water cycle and material cycle system 2010) with the municipalities in the prefecture by 2010. As a step for this plan, Nagano Prefecture is studying about "Intensive, integrated, and widening relocation of domestic effluent facilities", "Effective measure for sludge disposal", and "The maintenance and control of appropriate domestic effluent facilities" as the orientation.

#### b) Promotion of Basic plan for the restoration of water cycle system in Aichi

In Aichi Prefecture, "Basic plan for the restoration of water cycle system in Aichi" was formulated in March, 2006. The purpose is the restoration of healthy water cycle which has the proper balance of 4 functions: "purification of water", "sufficient water volume", "conservation of the biodiversity", and "the maintenance of waterside". Based on this plan, regional association for water cycle restoration was organized in each Owari, Nishi Mikawa, and Higashi Mikawa areas from January to March in 2007, and the action plan for the water cycle restoration was made and the activities started through model project. In July, 2007, "the restoration index of the water cycle system in Aichi" was made for people in Aichi to understand easily this plan and promote the activities for the restoration of water cycle. With using this index, people, enterprises, private groups, and government are collaborating and operating "river area monitoring simultaneous research" together.

### 8) Development of the measures for forest improvement

#### a) Forest improvement project by local people (Nagano forest improvement project by prefectural tax)

Based on the "Nagano forest improvement ordinance" (formulated in 2004), Nagano forest improvement prefectural tax was introduced to promote the forest improvement which enhances the multiple functions of forests with having the understanding of people and their proactive participation.

#### b) Aichi forest and green area improvement project

Based on the "Aichi forest and green area improvement tax ordinance" formulated in March, 2008, Aichi Prefecture introduced "Aichi forest and green area tax" which is the financial resource of the "Aichi forest and green area improvement project" which promotes the maintenance and conservation of forests, satoyama, and urban green area for next 10 years. This project is helping: 1.maintenance of the forest, 2.conservaion of satoyama, 3. urban greening, and 4.improvement of the forest and green area.

#### c) Forest improvement activities by various groups

Mie Prefecture formulated "Mie forest improvement ordinance" in October, 2005. Based on this ordinance, "Mie forest improvement basic plan" was formulated, which decided the middle- and long-term target of forest improvement and the measures which should be implemented comprehensively and systematically. This plan cited "the promotion of the participation of residents for forest improvement" as a basic policy.

#### d) Action for the cultivation abandoned land area

To restore the increasing cultivation abandoned land area, emergency plan is operating. Especially as the cause and the status of the cultivation abandoned lands are different for each case, various activities are promoted comprehensively, such as the restoration of cultivation abandoned lands, appropriate soil cultivation, training for the farmers who use the restored farmland, trial planting, processing, sales, the maintenance of the necessary facilities, and the research and coordination of the rights.

With applying these measures, 33.9% of agricultural settlements are working on the interactive activities between city and farming community by using local resources, and it is more than national average, 30.2%.

#### e) The activities to enhance the environmental quality of farming community

The Ministry of Agriculture, Forestry and Fisheries of Japan is promoting "measures for the improvement of farmland, water and environmental conservation" for the purpose of the area promotion through the protection of the environment of farming community and resources, such as farmland and agricultural water, and the conservation in good condition and the quality improvement. Because of this, they are supporting the cooperative activities involving local people which we can expect the effect, the advanced farming activities which permit to reduce the considerable amount of the use of chemical fertilizer and synthetic agricultural chemicals, and promoting the conservation of biodiversity.

Cooperative activities were implemented in 1,207 areas of Gifu, Aichi and Mie Prefectures due to the situation of settlements and river system area. The participants came from various groups, such as local people, farmers, residents' association, Midori Net, and JA. Their activities are succeeding.

In this way, under this measure, the activities, such as the research of the living things in the rice paddy to conserve the ecosystem, the extermination of alien species by reservoirs drying, and the environmentally-friendly agriculture are operated.

#### f) Efforts to prevent damages by wild birds or animals

Because of increasing damage to farm produce by wild boar, monkey, and deer, the government and various groups are taking measures. In addition of each prefectural effort, a nonprofit organization (NPO) called Chubu Ryobu Club in Okazaki city, Aichi Prefecture, has started new approach. Considering wild birds and animals as their resources, they are trying to activate the region, promote self-sustaining settlement, and cooperate in a wide-range area. This NPO is setting up the event to share the catch with the community and serve the boar and deer meat to elementary school children and residents.

In addition, Oku-Mikawa Vision Forum is trying to take advantage of the wild animals which bother the people in Oku-Mikawa. They catch and eat wild animals by themselves, and they are searching for the way to revive the settlement. They are setting up the workshop to use wild animal's meat, boar meat home cooking class and tasting event.

### (3) Rulemaking for the sustainable use of resources in the region

#### 1) Agreement for the fishery in Rokujo tidal flat

Regarding Rokujo tidal flat, the fishery had been restricted quite strictly for long time<sup>12</sup> by deciding the opening and closing fishery, the fishing period, and the fishing way. As for the collection of the young clam, it is still restricted now.

Rokujo tidal flat is a treasury of young clams. The collection is allowed during a definite period, and it is supplied by people of fishery in Mikawa Bay. As for the collection of young shells, the time of each fishery and each supply quantity are restricted for the reason of resource protection.

#### 2) Inland water fisheries considered river environment by Yahagi fisheries cooperative

Yahagi fisheries cooperative is developing the activities for natural sweetfish conservation, such as the self-imposed control of the spawning protection area and the monitoring of natural sweetfish upstream swimming, and also adopted "environmental fisheries declaration". They are systematically managing the resources in the river and promoting the inland fisheries in the whole region. At the 35th general meeting, which was the 100th anniversary of the foundation, in 2003, "the environmental fisheries declaration" was adopted as a guideline to overcome chronic stagnation of the environment and resources of the Yahagi River and provide the abundant inland water fisheries in the region.

#### 3)"Tomeyama" in the Kiso vally, the mountain which was forbidden to hunt and cut trees for the purpose of the conservation of the ecosystem in the Kiso vally

Kiso region, located between Hida mountains and Kiso mountains, forms large planting area with the tributary of the Kiso River and a part of satoyama side's mountains. There's well known as Kiso cypress production area which we call the Kiso valley. The Kiso vally received attention from the early Heian Era as abundant forest area, and the development of lumber in Kiso expanded dramatically after Hideyoshi Toyotomi designated Kiso region as direct control land in 1590. At the moment, the Kiso valley area is divided into the protection area and cypress production area, and Kiso cypress forest is conserved and developed in the practical way of artificial planting and the way of natural regeneration.

### (4) Sustainable management and using methods of natural resources

#### 1) Laver culture and traditional river construction method by bamboo and fascine called "Soda" (fascine : rough bundle of brush wood)

In Ise Bay and the Kiso Three Rivers, the bamboo and fascine collected from satoyama have been used for the pillars for laver culture, traditional river construction and traditional fishing method as one of the way of effective resources use for the cycle of satoyama ecosystem.

In the Matsunase coast area, "Hibidate" laver culture method, which is set up bamboo and brush wood in the sea to grow seaweed between them, is widely employed. Especially Matsunase coast is suitable for this method due to the simple land form and many appearances of tidal flats during low tide.

The traditional fishing method "Yana fishing", which closes a certain river area to catch sweetfish started from the Edo Era, was popular during summer in former Yamato village (current Ibigawa town) located in the midstream area of the Ibi River. Around the Nagara River and other rivers in the Chubu region, the fascine made of short trees and the branches of tall trees around satoyama is used as traditional river construction method.

In Gifu Prefecture, fascine is still produced and the satoyama is used as "fascine mountains". Gifu Academy of Forest Science and Culture is researching the ecosystem of "fascine mountains".

In addition, lumber business companies in Gifu Prefecture succeeded to establish the method to weaken the water flow by sinking fascine at the bottom of river.

<sup>12</sup> "Report of Japanese folk research 16, Folk in Tokai region, Aichi version" by Akio Oshima, San-ichi shobo,1996

## 2) Water catchment technique "Manbo" in the upstream area of the Suzuka River

In the northern Suzuka mountains, the Utsube River alluvial fan, and the plateau of Tarui area in Gifu Prefecture, horizontal well "Manbo" was used for the catchment of groundwater which was several meter below ground and the water was used for the irrigation of rice paddy on the plateau<sup>13</sup>.

"Manbo" is called Japanese qanat and a water facility which is peculiar to Tokai region. Generally Suzuka East mountains have fault escarpment, developed alluvial fans, and permeable Ando soils, and it was difficult to secure the water. This is the reason why the horizontal well was developing in this area. However, the role is reducing after agricultural water was secured by the government-run water business for Mie which accomplished in 1990.

The number of horizontal well is about 40 places in the Utsube River alluvial fan, and they are used for the irrigation of the 200ha of the rice paddy in the 800ha of rice paddy in the alluvial fan. They have been functioning as important water catchment for irrigation and widely accepted as a traditional technique in this area.

## 3) Slash and burn farming which is suitable for the feature of the land in Oku-Mikawa

In the mountain area of Oku-Mikawa, there are place names related to slash and burn farming such as "Sore", "Zore", and "Zori". They spread in the wide area between Kita Shitara-gun and the eastern Higashi Kamo-gun. Therefore, it's presumed that slash and burn farming was widely practiced until the time of Taisho Era. In Toyone village, slash and burn farming was one of the typical forest use in the Meiji Era. The land and timing for slash and burn was decided by land's feature and the crop to cultivate was chosen by the land capability<sup>14</sup>. At the moment, Toyone village started managing experience tour of slash burn farming with the cooperation of local residents and NPO. Slash and burn is becoming a regional resource to convey the traditional history and culture.

## 4) Subsistence supported by the characteristics of wetland in "Waju" area of Nobi plain

In Nobi plain, which has high-lying land in the east and low-lying land in the west, the Kiso Three Rivers (the Ibi, Kiso, and Nagara Rivers) run just next to each other or together till Ise Bay located in the southwest area of the plain, and the wetland spread out especially in the floodplain area where the land is sometimes below sea level. The downstream areas of the Kiso Three Rivers are called "Waju" and well known as where the settlement and cultivated area are surrounded by embankment to protect from flood. In this area, webbing water network by natural rivers and water ways was formed, and the businesses used the characteristics of wetland such as boat business and fishing fresh water fish were practiced<sup>15</sup>.

In the natural rivers and water ways, fresh water algae was collected and used as the material of compost. The collection of fresh water algae was continued till after war, and it had quite important role for agriculture.

In the "Waju" area where the businesses based on the characteristics of natural wetland environment was maintained, various living things are found in the water ways and rice paddy.

In Wanouchi town, Ampachi gun, Gifu Prefecture, golden venus chub, which is one of the Japanese endemic species of fresh water fish, lives in close relation with the agriculture in Waju area, and threatened species I B which lives in only limited place in Japan was found when Tokai Regional Agricultural Administration Office practiced "Research of the improvement technique for the habitat environment". Therefore, the ordinance for the protection of golden venus chub was established and the activities for the biodiversity conservation are developing in this area.

<sup>13</sup> Japanese topography the 13th volume, Kinki region, Mie, Shiga, Nara Prefectures" by Japanese topography research center, published by Ninomiya shoten, 1976

<sup>14</sup> Community Research Institute Aichi University, research result VII, the formation of Okumikawa rural area and the forests" by Yoshihisa Fujita, published by Meicho shuppan, 1992

<sup>15</sup> Folk history group, Committee of Aichi history complication "Aichi folk history report 4" Prefectural history compilation room, General affaire division, Aichi Pref.,2001  
Japanese topography the 12th volume, Aichi, Gifu" by Japanese topography research center, published by Ninomiya shoten, 1969

## (3) Efforts for the local revitalization by using natural resources

### 1) Conservation activities for rice terrace by various groups

In Yotsuya rice terrace and Sakaori rice terrace, the activities to resolve the abandonment of cultivation land and conserve rice terrace are quite popular and these activities contribute to the revitalization of the region. In Yotsuya rice terrace, the Kurakake rice terrace preservation association was established in 1997. The association and local groups are promoting the rice terrace conservation activities such as the resolution of the cultivation abandoned land and the exchange activities between cities and farming villages with the help of government, supporters from cities, and research institute. The action groups are developing their activities closely connected with the region and promoting the local revitalization.

In Sakaori rice terrace, NPO called Ena Sakaori Rice Terrace Preservation Association was established in 2001, and it's developing in various ways such as rice terrace owner system, stone masonry school, and the development of rice terrace brand-name rice. The stone masonry school co-hosted by Yamazato Culture Research Center has started from 2006. The school is held to hand down the technique and restore the stone masonry. Especially the tradition of the technique is highly praised.

### 2) Promotion of renaissance business in the Miya River region by the Miya River region renaissance association

In the Miya River region, for the purpose of the local revitalization by conserving and restoring of abundant nature, history and culture, "the Miya River renaissance association" was founded by 14 municipalities in the Miya River region, Mie Prefecture, and government agency in June, 2000. They are promoting the activities based on the community like Miya River eco museum.

The Miya River region is considered as living museum which integrated the nature, history, culture, industry, and tradition. Moreover, the ecotourism to convey the background and memories of this region formed over long years is regularly practiced by "area guide". In addition, regional residents, NPO, and volunteers from educational agency are researching the water environment by water quality pack test and aquatic life in 50 places of the region once a month, and releasing the results, and developing businesses with other various groups to enhance residents and children's interests in the Miya River and promote understanding that the Miya River region connects with all Miya River basin.

## (6) Development of activities for the region restoration by residents

### 1) Tidal flat conservation activities in Fujimae tidal flat

In 1981, the 105ha of the west 1st lot which is a part of Fujimae tidal flat was allocated to waste disposal area under Nagoya Port planning, and was planned to landfill. It became a big social problem. In 1987, 15 environmental conservation groups got together and established "the Save Fujimae Association" to conserve Fujimae tidal flat. "The Save Fujimae Association" has renamed later "the Fujimae Ramsar Society".

With receiving the attention from all over the country due to their active action, in 1999, Nagoya city announced that the plan was dropped. After this announcement, the Fujimae Ramsar Society became an NPO in 2003 and is promoting the environmental conservation and restoration of Fujimae tidal flat.

In Fujimae tidal flat, Inae Visitors' Center, which is the conservation and activity facility, and Fujimae Activity Center were established in 2005. These facilities are used as a hub of activities such as the promotion of environmental learning by the Fujimae Ramsar Society and the study of the conservation and use of Fujimae tidal flat by Fujimae tidal flat meeting.

### 2) Inheritance of the spirit and result of EXPO 2005 AICHI, JAPAN

EXPO 2005 AICHI, JAPAN was held in Nagakute town and Seto city from March to September in 2005. The theme was "Nature's wisdom" and the spirit was "co-existence of human being, nature, and the earth, and creation of sustainable growth society".

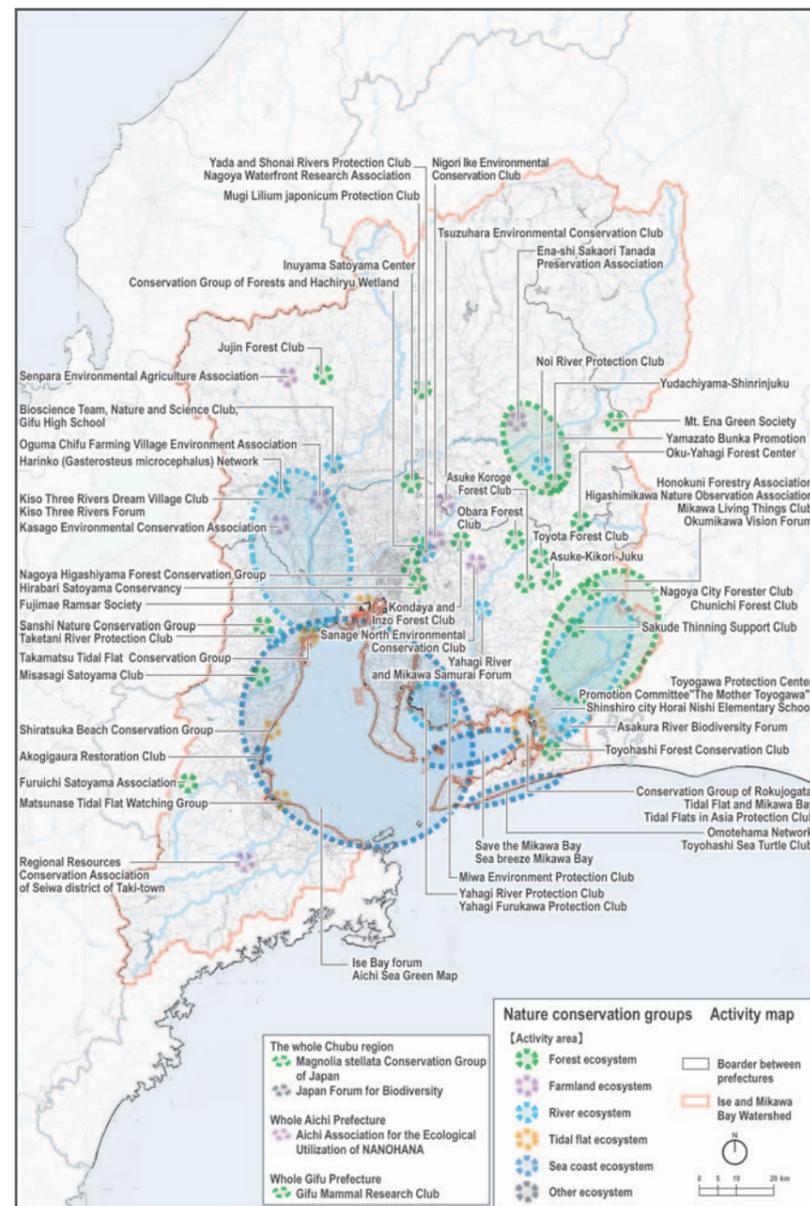
To inherit and develop the spirit and result of EXPO 2005 AICHI, the construction of the facilities where people can use for their activities and forums are developing in Nagoya city.

### 3) Construction of the network related to the protection activities for flagship species

As typical threatened wildlife in the Chubu region, there are star magnolia, and *Gasterosteus microcephalus*, one of the fresh water fish. They became a part of flagship species in the Chubu region now. This fresh water fish lives in the spring-fed pond and rivers run from those ponds. This fish is familiar as the symbol of hometown as it used to be everywhere in the Seino region. In the Chubu region, the network related to protection activities which focused on the symbolic species is building up. As example, there are "Japan Magnolia stellata protection association" and "Harinko network".

### 4) Development of activities by local people

In Ise Mikawa Bay watershed, the activities for forest, satoyama, rivers, and the sea by local people are developing as the below map shows.



Note: The group working on farmland ecosystem is "Organization for the countermeasures to improve the conservation of farmland, water, and environment"

Graphic 18: Distribution of the activity areas by main groups for the conservation of natural environment

## 6. Concept and target of "A strategic vision for the conservation and sustainable use of biodiversity in Ise Miakawa Bay watershed involving local people and communities"

In 4. and 5., "Current status and issues in Ise Mikawa Bay watershed", "Potential for the restoration of Ise Mikawa Bay watershed" were mentioned.

For the biodiversity conservation and the sustainable use in the watershed, we found out that people are already working on it in many ways. For example, as the countermeasures to resolve the issue of "water quality (high Chemical Oxygen Demand level) and the generation of red tide and blue tide", there are activities such as environmental monitoring, releasing information, biological research of sweetfish in the Yahagi River, Action plan for the restoration of Ise Bay, and Action plan for the restoration of Mikawa Bay region. As for the countermeasures to resolve the issue of shrinking tidal flats, seaweed beds and natural coast, there are activities such as "Sea health check" and the restoration of tidal flats and seaweed beds around the coast by Ise-Mikawa Bioregions network and other groups.

As above, the activities have been already started to resolve the issues related to the biodiversity conservation and its sustainable use in Ise Mikawa Bay watershed. The key to make these activities more effective is further participation by various groups.

### (1) Vision and target of biodiversity conservation

Ise Mikawa Bay watershed was once a region where people received abundant natural blessings. However, instead of convenient life due to industrial development, economical basis development, and urbanization since the period of high economic growth, many problems came up in the sea, satoyama, rivers, and forests. From the view of economics, to hand down the precious human heritage from generation to generation, Hirofumi Uzawa proposes "Social Overhead Capital".

#### "Social Overhead Capital"

Social overhead capital is a social device that enables us to live financially prosperous lives, improve the level of our culture, and maintain an appealing society with a human touch. It protects the dignity of all people and entitles them to the maximum level of civil rights. Even if the social overhead capital consists of personal rare resources, it is controlled and managed as social common capital by social standard. In this way, social over head capital is in contraposition to private capital or rare resources, but the concrete composition is not decided by priori or logical standard. Considering each country's or regional nature, history, culture, society, economy and technique, it's decided through political process.

(Reference: Hirofumi Uzawa, Social Overhead Capital, Page 4, Iwanami Shoten)

"Knowledge", "Culture", and "System" which are related to the targets of the CBD: "Biodiversity conservation" and "Sustainable use of the resources" are mentioned as below by Uzawa.

The correlation between nature and human being becomes clear when we use natural resources. In traditional society, people need to rely on the local resources as the travel capacity of people and materials are quite limited. Therefore, the depletion of these resources brings the immediate risk of the existence of traditional society. The culture of traditional society has deep detailed knowledge about the ecological condition of regional nature and social norm about the use of resources was formed to maintain the ecosystem.

Regarding the use of natural resources, the knowledge accumulated through the long historical experiences was handed down from generation to generation. The knowledge about the natural environment and the conveyance beyond generations form the culture and the culture creates new knowledge. The social institution is formed in the process of the conveyance of knowledge over the generations. The daily and institutionalized life establish social institution and form a culture.

(Reference: Hirofumi Uzawa, Social Overhead Capital, Page 211 to 212, Iwanami Shoten)



## (2) "The Post-2010 targets (Proposal by Japan)" and target in Ise Mikawa Bay watershed

"The Convention on Biological Diversity Post-2010 targets (Proposal by Japan)" submitted by Japanese government to Secretariat of the Convention on Biological Diversity in January 6, 2010 has mid-term and short-term targets as below.

### 1. Vision, Mid/long-term Target (2050)

Enhancing the harmony between human being and nature all around the world, to improve the state of biodiversity from the current level as well as to sustainably increase the benefits of ecosystem services

### 2. Mission, Short-term Targets (2020)

To have the following actions taken by 2020, so as to halt biodiversity loss,

- ① To conduct full observations and analyses on the state of biodiversity at global scale and on scientific justification. To make ecosystem services respected in every aspect of human society.
- ② To expand activities for biodiversity conservation, to promote practical methods for sustainable use of biodiversity and to establish mechanisms for reducing adverse effects of human activities on biodiversity.
- ③ To mainstream biodiversity by ensuring new steps to be taken by various individuals.

As for the short-term targets, the activities for the targets 2020 have already started in Ise Mikawa Bay watershed as below.

- ① **As for the status of biodiversity**, not only continuous research and analysis by various agencies and groups, but also research by people are conducted and the information is shared by people. Moreover, the artificial forests which account for the most of land in the region were researched and grasped the most detailed data by the cooperation between researchers and people.  
As for the blessings from the ecosystem of marine and coastal areas, they are widely shared in the region as a blessing of "food" like clams, and also people aware the importance of upstream and mountainous areas which are based on forest ecosystem for the biodiversity in the marine and coastal areas. Therefore, this region is quite active area for the forest volunteer in the country.
- ② **As for the activities for biodiversity conservation**, to conserve and restore the biodiversity, government and local people are promoting together based on the researches by various groups. For example, they are working on the activity to protect and restore tidal flats and seaweed beds and the forest improvement to avoid disaster in the mountain due to the degradation of the biodiversity in the artificial forests. At schools, the programs for the conservation and restoration of tidal flats, satoyama, and artificial forests are practiced and children are participating in those activities.
- ③ **As for the mainstreaming of biodiversity**, to feel the ecosystem service in urban life, two approaches are becoming the basic way: the approach through participation in symposiums and study meetings of biodiversity and the approach through experiences that we can feel the ecosystem service such as field surveys and volunteer activities.

In Ise Mikawa Bay watershed, the achievement of "The 2010 Biodiversity Target" (achieving by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to alleviating poverty and to the benefit of all life on Earth) is difficult, but to implement the post-2010 target, further activities are required.

## (3) Three targets of visions and activities which have already started

In this Vision, there are three targets, but actually lots of activities are already developing to achieve the targets in Ise Mikawa watershed. We are trying to release the information widely and expand activities.

### Target 1 : Make occasions and network to think about the biodiversity in the watershed

#### ■ Example of the occasion to think about the current food situation

- Think of the critical situation of our daily food

#### ■ Example of the network to think about water quality

- Learn and think about actual water quality in Ise Mikawa Bay

#### ■ Example of the occasion to feel the sea

- Make occasions for children to learn the sea environment in the region

#### ■ Example of the network to think about current marine organism

- Think about the loss of laying-egg place of loggerhead turtle due to the erosion of the beach

#### ■ Example of the network to think about marine litters

- Learn the actual status of the amount of marine litters

#### ■ Example of occasion to think about river pollution

- Learn about river pollution problem such by sludge

#### ■ Example of the occasion to learn and think about alien species

- Learn about the increase of alien species such as raccoons and largemouth basses

#### ■ Example of the occasion to think of coexistence with wildlife

- Think about the way to solve the confliction between human being and wildlife

#### ■ Example of the occasion to learn and think about the current situation of forests

- Learn about the expansion of bald mountains due to reckless deforestation in the modern age

#### ■ Example of the occasion to learn and think about the current situation of forests

- Learn that the changeover of forests reached approx.11,000ha in the decade from 1990
- Learn that the delay of the thinning of artificial forest affects the region

## Target 2 : Act for the restoration of Ise Mikawa Bay watershed

### ■ Example of activities for biodiversity and restoration of the region

- To resolve biodiversity conservation and sustainable benefit sharing, use local knowledge and technology in the Chubu region

### ■ Example of the action for biodiversity and development of region

- By individualizing and deepening common issues in the Chubu region, conserve biodiversity

### ■ Example of the action for marine restoration

- Act to restore the abundant Ise Mikawa Bay

### ■ Example of the action for marine restoration

- Experience water quality in Ise Miakwa Bay

### ■ Example of the action for the restoration of tidal flats

- Learn and act the function of tidal flats

### ■ Example of occasion to think about river pollution

- Learn about river pollution problem such by sludge

### ■ Example of the action for the restoration of satoyama

- Maintain the sustainable and material-cycled life in satoyama and settlements

### ■ Example of the action for the restoration of satoyama

- Conserve farmland and the natural environment of rural area such as rice paddies which grow many living things by the cooperation of the communities

### ■ Example of the action for the restoration of forest

- Create occasions to enjoy and feel forest health

### ■ Example of the action to connect with forests, satoyama, rivers ,and the sea

- Research the transition of the habitat environment of living things and the change of the population in Ise Mikawa Bay watershed

### ■ Example of the action to connect with forests, satoyama, rivers ,and the sea

- Alleviate the burdens caused by the fragmentation of the connection of forests, satoyama, and the sea

### ■ Example of the action to connect with forests, satoyama, rivers ,and the sea

- Create occasions to observe living things in the forests, satoyama, rivers, and sea

### ■ Example of the action to connect with forests, satoyama, rivers ,and the sea

- For the restoration of Ise Mikawa Bay, before the action, think about forests from the view of the sea, think the sea from the view of forests

## Target 3 : Create systems to restore the biodiversity in the watershed

### ■ Example of the system to promote information sharing

- Convey the information that biodiversity is related to all our life environment

### ■ Example of system to promote the researches of regional current status

- Promote the research with nation, prefectures, municipalities, and researchers to collect natural environment data, such as inhabitation status of living things, water quality, the generation of red tide and blue tide, sludge flown down and fish catches. Think the system to release the result to the public

### ■ Example of the system for regional autonomy

- Devise the ways for regional autonomy in each place

### ■ Example of the system for sustainable use of resources

- Promote rulemaking for the sustainable use of resources which suit to the region

### ■ Example of the recommendation of the fundamental reform for the restoration of Ise Mikawa Bay watershed

- Recommend fundamental reform such as establishing a new organization

## 7. Strategy for attainment of the targets of this vision

For the attainment of the targets of this vision, in addition to the activities already started by the communities and people of Ise Miakwa Bay watershed, the below two strategic activities will be promoted.

### Strategy 1 : Strengthening of the framework for biodiversity conservation and the sustainable use

#### ■ Example of the designation of protection areas

- The designation of protection area such as the Natural Parks Law and nature restoration (included the development of tidal flats) for biodiversity conservation and the sustainable use in the necessary areas in the region including the marine area

#### ■ Example of the efforts for the restoration of the region

- The efforts to promote the sustainable use with practicing the restoration and conservation of ecosystem

Restoration of satoyama based on the ecosystem network plan

Research and examination about compensatory mitigation

Conservation of rare wildlife

#### ■ Example of the reinforcement of community support

- Reinforcement of community support for sustainable use of resources

## Strategy 2 : Development of the activities for the network construction of people (organization) and information

### ■ Example of organized various groups

- Organization of the round-table meeting for the watershed by nation, prefecture, municipality, business enterprise, mass media, and experts

#### Study for the construction of (Tentative name)

#### "Ise Mikawa Bay bioregion cooperative community"

In Ise Mikawa Bay watershed, which we can call a bioregion, to conserve the biodiversity and realize the sustainable use of resources (purpose), the following study will be conducted as a structure of cooperative activities among various groups

#### Construction of cooperative community

Member : Administrative organs, groups, business enterprises, and experts which agree with the purpose, want to positively participate, and cooperate

Administrative organs and groups which want the development of the conservation of biodiversity and the use in the region

Researchers and experts who study the conservation of biodiversity in the region

Enterprises and NPO which consider the contribution to the sustainable society

Municipality aiming at the ecological city

Mass media which assume the enlightenment

Forestry, agriculture, fishery entities

Groups and association related to water source, water purification, and water use

Observer: Groups which agree with the purpose, observe with interest, and support

Graphic 19 : The construction of " Ise Mikawa Bay bioregion cooperative community" to construct a society for biodiversity conservation and the sustainable use

### ■ Example of the occasion to contact various groups

- Securement of the place that various groups can contact each other like Environmental Partnership Office Chubu
- Making structure of human resource development and personnel exchanges like organizing various training

### ■ Example of the construction of the structure which various groups can work on sustainably

- Making structure for the sustainable activities by NGO etc. which are getting involved in the project for the biodiversity conservation

### ■ Example of the system that various groups can interact

- Information sharing of biodiversity in Ise Mikawa Bay watershed, such as website

## 8. For further approach to sustain biodiversity in the region

To formulate this purpose, the symposium "Ise Bay, the future of forests, satoyama, rivers and the sea" was held on March 6th, 2010, as a practical first step to convey the thoughts and the targets.

At this symposium, we had the keynote speech about the Social Overhead Capital, which is the base of this vision, from professor emeritus at Tokyo University (member of Japan Academy), Hirofumi Uzawa.

At the panel "To connect people with nature", the activities for the conservation and sustainable use of the biodiversity in Ise Mikawa Bay watershed were introduced. As for the activities for the sea, Mr. Koji Kamei introduced the activities for the conservation of the tidal flats by Fujimae Ramsar Society. As for the activities for forests, Mr. Kenji Niwa introduced forest health check and satoyama culture research by Yahagi River System Forest Volunteer Association. Associate professor of Kyushu Univ. Graduate School, Satoko Seino, mentioned that these activities were based on the local knowledge in Ise Mikawa Bay watershed. In the end of symposium, the draft of the declaration of this symposium was shown and it's unanimously adopted.

This declaration includes all contents of this vision such as the land history, the current issues, the concept and the target. The adoption of this declaration helped us to understand that the biodiversity was our common treasure and respect the traditional knowledge.

From now, to restore, conserve and sustain the biodiversity in Ise Mikawa Bay watershed, people from forest area, satoyama, river area, and the sea area need to collaborate, cooperate widely and act to realize this vision.

## Symposium "Ise Bay, the future of forests, satoyama, rivers and the sea"

Date : Sat., March 6, 2010 from 13:00 to 16:15

Place: Aichi Industry & Labor Center, Winc Aichi, Winc Hall

Host : Chubu Regional Environment Office, Ministry of the Environment

Joint hosting: Chunichi Shimbun

Sponsors : KAGOME CO., Ltd., Central Nippon Expressway Company Limited, UNY CO., Ltd.

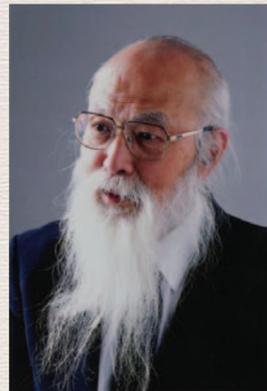
### Program

(1) Opening speech (13:00~13:10)

(2) Keynote lecture (13:10~14:10)

"Social Overhead Capital and Biodiversity"

Professor emeritus at Tokyo University, member of Japan Academy, Professor Hirofumi Uzawa



Hirofumi Uzawa

Birth: 1928

Academic background:

Obtaining a doctorate in Mathematics at University of Tokyo in 1951

Associate professor of Economics at Stanford University from 1956,

Assistant professor of Economics at the University of California,

Professor of Economics at the University of Chicago

Professor of Economics at Tokyo University in 1969

Awards and honors:

Professor emeritus of Tokyo University, Persons of Cultural Merit,

a member of the Japan Academy,

a guest member of the National Academy of Sciences,

Recipient of the Order of Culture in 1997 and Blue planet award in 2009

Publications:

"Social Overhead Capital", "Economic Theory and Global Warming",

"Poverty of "Affluent Society"(Iwanami Shoten),"Consideration of optimum city"(University of Tokyo Press)

(3) Panel (14:25~16:00)

"To connect people with nature"

• Coordinator: Tomoyuki Katada (Chunichi Shimbun, Gifu branch manager)

• Panelist: Satoko Seino (Kyushu Univ. Graduate School)

Koji Kamei (Fujimae Ramsar Society)

Kenji Niwa (Association of Forest Volunteers in Yahagi River Region)

People from mountains and the sea



Tomoyuki Katada



Satoko Seino



Koji Kamei



Kenji Niwa

(4) Drawing for the present from sponsors (16:00~16:15)

### Exhibit chart

At the same time, the charts about the activities for the conservation and sustainable use of biodiversity by the government and each region's groups were exhibited at the same site of the symposium.

## Symposium title "Ise Bay, the future of forests, satoyama, rivers and the sea"

In Miakawa Bay watershed, which we can call a bioregion, we are fortunate to live, work and learn with the abundant blessings of various living things and the habitat environment. The biodiversity and habitat environment are one of the important component of social overhead capital which supports our life and the following generation.

Because of our excessive economic and social activities during last 50 years, our life became convenient. At the same time, we continued to force forests, satoyama, rivers and the sea to bear the burdens. The biodiversity and the habitat environment around us are facing a crisis now.

We need to realize the mistakes of the past and make efforts to promote a future in which whales migrate to this area, tidelands are filled with clams, sweetfish can swim upstream, insects such as dragonflies and butterflies, not to mention an abundance of birds and most important of all a future where all these things are abundant and subsequent generations of people live in harmony with them. In order to do this, we need to restore and conserve the habitat and biodiversity and use the resources wisely in tune with our forefathers wisdom.

Taking this opportunity of the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity (COP10), to realize the conservation, restoration and sensible use of the biodiversity and habitat environment, and to cooperate and expand the activities beyond the position of each area, the people of forests, satoyama, rivers and the sea, we declare the followings:

- 1. We will participate in the occasion to talk about biodiversity of Ise Mikawa Bay watershed and develop the network.**
- 2. We will act for the restoration of Ise Mikawa Bay watershed in each place.**
- 3. We will create the better system for biodiversity conservation and the restoration of Ise Mikawa Bay watershed.**

March 6, 2010

Participants of symposium "Ise Bay, the future of forests, satoyama, rivers and the sea"

A strategic vision for the conservation and sustainable use of biodiversity  
in Ise Miakawa Bay watershed involving local people and communities  
(Outline)

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Ministry of the Environment

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