


# Globally Important Agricultural Heritage Systems (GIAHS) Application

## SUMMARY INFORMATION

<p><b>Name/Title of the Agricultural Heritage System:</b> Osaki Kōdo's Traditional Water Management System for Sustainable Paddy Agriculture</p>
<p><b>Requesting Agency:</b> Osaki Region, Miyagi Prefecture (Osaki City, Shikama Town, Kami Town, Wakuya Town, Misato Town (one city, four towns))</p> <p><b>Requesting Organization:</b> Osaki Region Committee for the Promotion of Globally Important Agricultural Heritage Systems</p> <p><b>Members of Organization:</b> Osaki City, Shikama Town, Kami Town, Wakuya Town, Misato Town Miyagi Prefecture Furukawa Agricultural Cooperative Association, Kami Yotsuba Agricultural Cooperative Association, Iwadeyama Agricultural Cooperative Association, Midorino Agricultural Cooperative Association, Osaki Region Water Management Council NPO Ecopal Kejonuma, NPO Kabukuri Numakko Club, NPO Society for Shinaimotsugo Conservation , NPO Tambo, Japanese Association for Wild Geese Protection Tohoku University, Miyagi University of Education, Miyagi University, Chuo University</p>
<p><b>Responsible Ministry (for the Government): Ministry of Agriculture, Forestry and Fisheries</b></p>
<p><b>The geographical coordinates are:</b> North latitude 38° 26' 18" ~38° 55' 25" and east longitude 140° 42' 2" ~141° 7' 43"</p> 
<p><b>Accessibility of the Site to Capital City of Major Cities</b></p> <ul style="list-style-type: none"> <li>○Prefectural Capital: Sendai City (closest station: JR Sendai Station)</li> <li>○Access to Prefectural Capital: <ul style="list-style-type: none"> <li>• by rail (Tokyo – Sendai) JR Tohoku Super Express (Shinkansen): approximately 2 hours</li> </ul> </li> <li>※Access to requesting area: <ul style="list-style-type: none"> <li>• by rail (closest station: JR Furukawa Station) JR Tohoku Super Express (Shinkansen): 17 minutes JR local trains: 1 hour 30 minutes</li> <li>• by car: approximately 1 hour</li> </ul> </li> </ul>

<p><b>Area of Coverage</b><sup>1)</sup>: approximately 1,524km<sup>2</sup> (152,381ha)  agricultural area<sup>2)</sup>: 362km<sup>2</sup> (36,190ha); forested area<sup>1)</sup>: 837 km<sup>2</sup> (83,684ha)</p>
<p><b>Agro-ecological Zones:</b> Paddy agriculture in temperate zone</p>
<p><b>Topographic Features:</b> Alluvial plain</p>
<p><b>Climate Type:</b> Humid subtropical climate</p>
<p><b>Approximate Population</b><sup>3)</sup> (<b>Beneficiary</b><sup>1)</sup>): 205,925 / 20,451</p>
<p><b>Ethnicity/Indigenous population:</b> N/A</p>
<p><b>Main Source of Livelihoods:</b> agriculture, forestry, industry and commerce</p>
<p><b>Summary Information of the Agricultural System:</b>  The Osaki region has developed as a paddy agriculture region by using the lowland swamps and wetlands that extend across the basins of Eai River and Naruse River. The region frequently experiences drought, is prone to flooding due to the topographical features of a landscape that rolls down from precipitous mountain areas to low gradient plains, and suffers cold temperature damage caused by the <i>yamase</i>, a cold and moist seasonal wind that is unique to the Pacific coast of the Tohoku region. However, in order to secure food and maintain their livelihoods under such challenging environmental conditions, farmers of this region have accumulated a wealth of knowledge and used their ingenuity to manage and coordinate water resources. Their tireless efforts to develop a paddy agriculture system centered on rice production have allowed them to hand down from generation to generation the fertile land known as “Osaki Kōdo.”</p> <p><b>Ingenious water management system that supports agriculture</b>  In order to make rice cultivation possible in a challenging natural environment, from medieval times, the people of Osaki Kōdo have exerted much effort into achieving both water use and flood prevention. They have built intake weirs, tunnels and drainage tunnels, reservoirs and networks of irrigation and drainage channels, thus securing the means for irrigating and draining water, without which agriculture in the Osaki region would not be possible. They have also implemented various preventive measures against <i>yamase</i> winds, including ingeniously taking advantage of water temperatures to raise seedlings, applying “deep-water management” (raising paddy water levels), and stopping the irrigation water flow during the daytime. In anticipation of floods, flood control basins have been created to reduce inundation damage. This ingenious water management system has been implemented and administered by water users organizations founded upon the <i>keiyakukō</i>, which is a long-established local reciprocity-based organization.</p> <p><b>1. Rich landscape</b>  The lives of local farmers are supported by the <i>igune</i>, woodlands planted around houses in protection against floods and winter northwesterly winds. Home to many tree and plant species, the <i>igune</i> are used as a source of daily food. As “forests floating in rice paddies,” they interconnect with surrounding rice paddies and water channel networks, thus creating a unique landscape that provides habitats for a variety of florae and faunae.</p> <p><b>2. Traditional farming culture</b>  Farming practices generated nature-worshipping folk beliefs, including worshipping the mountains where water is sourced, agricultural rituals and folk performing arts that are performed in prayer or in appreciation of a bountiful harvest, and the <i>tōji</i> culture of going to the hot springs to recover from the fatigue of hard agricultural labor. Furthermore, a rich and diversified local food culture was born, including <i>mochi</i> (rice cakes) cuisine, which was enjoyed in between stages of rice production; fermented food such as sake, miso (soybean paste) and soy sauce; and loaches and crucian carps, which are byproducts of fishing in the rice paddies.</p> <p><b>3. Agriculture in symbiosis with biodiversity.</b>  Paddy agriculture based on the traditional water management system has contributed to the conservation of greater white-fronted geese and various other living creatures that are dependent on the wetland ecosystem of rice paddies. It also develops agriculture-oriented symbiotic relationships in which indigenous natural enemies such as frogs, spiders and dragonflies control pests. On the other hand, there are rising concerns that the biodiversity conservation functions that have been supported</p>

by the traditional water management system and paddy agriculture may decline due to stagnant rice prices, dependency on pesticides and chemical fertilizers, the aging and lack of farmers. In this region, these social risk factors have been addressed by increasing public awareness about the importance of food safety, consumer trust and biodiversity, producing organic and environment-friendly rice through pest control methods drawing on ecosystem functions, promoting the development of the sixth sector, building trust through producer-consumer exchange and developing a new distribution system based on their mutual support.

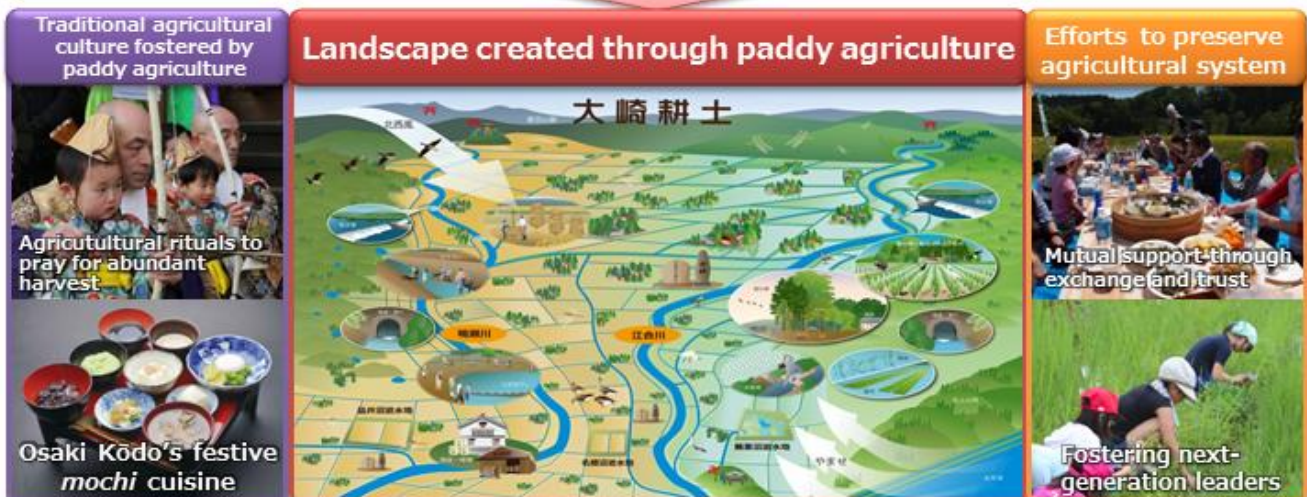
Therefore, the paddy agriculture of this region has overcome the challenges of a unique and challenging natural environment frequently exposed to *yamase* winds, floods and drought. The people accumulated the wisdom to use water wisely, and preserved an integrated ecosystem of rice paddies and wetland. It is an agricultural system featuring high resilience and innovation in the face of agricultural and ecosystem-related risks and change induced by climate change and social factors.

# Osaki Kōdo's Traditional Water Management System for Sustainable Paddy Agriculture

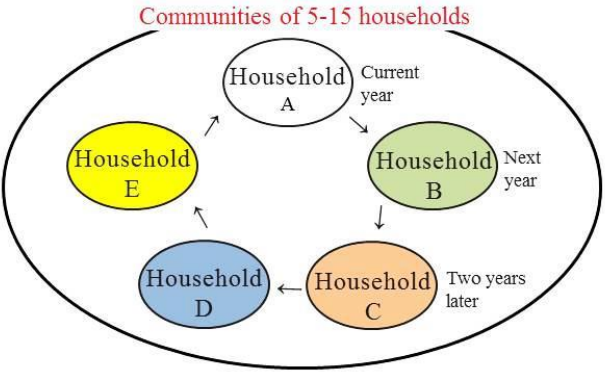
A paddy agriculture system that has overcome challenging natural circumstances with high risk of cold temperature damage due to *yamase* winds, flood and drought through ingenious water management and land use, thereby preserving coexistence with wetland ecosystems, traditional agricultural culture and valuable landscape

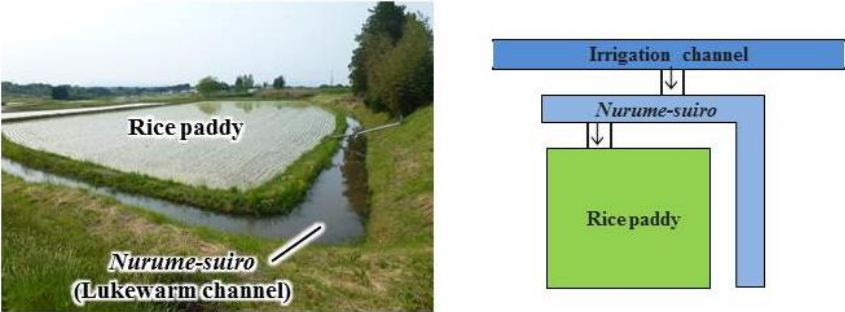
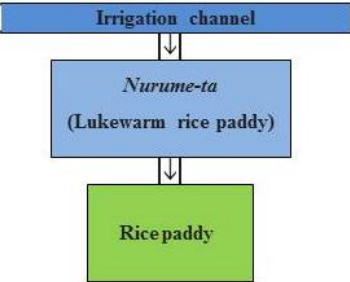
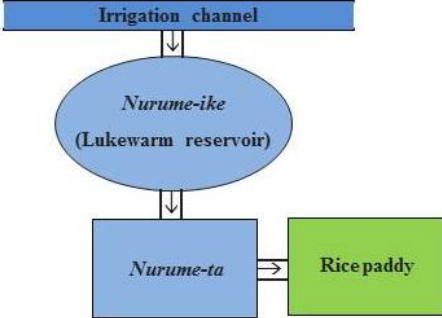


## Landscape and traditional culture fostered in Osaki Kōdo, efforts for preservation



## Glossary

<p><i>Osaki Kōdo</i></p>	<p>The name of this paddy agriculture region, which was developed from the floodplains spreading across the basins of two rivers. It developed as a fertile land as a result of the farsighted agricultural policy of Date Masamune who settled himself in this region, on Iwadeyama.</p>			
<p><i>yamase wind</i></p>	<p>A cold and moist seasonal wind that blows from the Okhotsk High during the rainy season</p>			
<p><i>Keiyakukō</i></p>	<p>The <i>keiyakukō</i> is, as <i>keiyaku</i> means “contract and <i>kō</i> means “association,” a group which faced with harsh natural conditions has formed together to mutually cooperate in agriculture, water management, and the other various activities of daily life. In order to support the community, the <i>keiyakukō</i> has established rules, commonly written, regarding the various roles and obligations of participating members. Although the basis for the group is a shared territorial bond, because this bond is close to that of a familial or kinship relationship it can be said that the <i>keiyakukō</i> is the core community unit of local society.</p> <div style="text-align: center; margin: 20px 0;"> <p><b>Structure of a <i>keiyakukō</i></b></p>  </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <ul style="list-style-type: none"> <li>• The head of the household (father) represents each household</li> <li>• The head of a <i>keiyakukō</i> is determined by annual rotation.</li> </ul> </div> <div style="width: 35%; border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>Social organizations by age group</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;"> <p>① <i>Keiyakukō</i> (Head of household)</p> </td> </tr> <tr> <td style="padding: 2px;"> <p>② <i>Wakamono-keiyaku</i> (Generation of members of young men’s organizations; Next-generation head of )</p> </td> </tr> <tr> <td style="padding: 2px;"> <p>③ <i>Kodomo-keiyaku</i> (Children)</p> </td> </tr> </table> <p>※People become members of social organizations of a higher level as the grow older</p> </div> </div> <p style="margin-top: 20px;">The figure above indicates the organizational structure and rotational scheme of the <i>keiyakukō</i>. The <i>keiyakukō</i> is a social organization that usually comprises 5-15 households. The head of each household becomes a member and meets once or twice annually to discuss various matters. The leader, which changes every year, is determined by rotation. The <i>wakamono-keiyaku</i> and <i>kodomo-keiyaku</i> foster next-generation leaders.</p>	<p>① <i>Keiyakukō</i> (Head of household)</p>	<p>② <i>Wakamono-keiyaku</i> (Generation of members of young men’s organizations; Next-generation head of )</p>	<p>③ <i>Kodomo-keiyaku</i> (Children)</p>
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<p>③ <i>Kodomo-keiyaku</i> (Children)</p>				

<p><i>deep water management</i></p>	<p>A method of water management where the paddy water level is raised to keep the rice plant deeper in the water in protection against cold temperatures</p>
<p><i>Bansui</i></p>	<p>A block rotation-oriented water control system that is implemented in Osaki Kōdo either in a wide area or on a more local basis.</p>
<p><i>nurume-suiro</i></p>	<p>A channel used to avoid irrigating cold water directly from the stream. In some mountainous areas, entire rice paddies are used as "nurume-ta" to warm up the water.</p> <div style="text-align: center;"> <p><b>Example 1</b></p>  </div> <div style="text-align: center;"> <p><b>Example 2</b></p>  </div> <div style="text-align: center;"> <p><b>Example 3</b></p>  </div> <p>The diagram above show three structurally different examples of a <i>nurume-suiro</i>. The first diagram shows a case where the <i>nurume-suiro</i> is the only measure taken. The second example adds a <i>nurume-ta</i> (lukewarm rice paddy) to the landscape and the third adds a <i>nurume-ike</i> (lukewarm reservoir). The structure of the <i>nurume-suiro</i> is diversified, all the more in mountainous areas where the water is warmed in multiple stages.</p>
<p><i>Igune</i></p>	<p>Homestead woodlands commonly seen in Osaki Kōdo. Igune have been planted so that they protected farmers' houses from floods and northwesterly winds during the winter. Igune are examples of what the FAO refers to as "trees outside forests (TOF)".</p>
<p><i>Mochi</i></p>	<p>Rice cakes made by pounding glutinous rice. There are 46 ways to eat <i>mochi</i>, in terms of garnishing styles and cooking methods.</p>
<p><i>fermented food</i></p>	<p>Traditional food that is made by fermenting local produce. Most fermented food, such sake, miso, natto and soy sauce, can be preserved.</p>

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# DESCRIPTION OF THE AGRICULTURAL HERITAGE SYSTEM

## 1. Significance of the Proposed GIAHS Site

### a) A traditional and ingenious water management system that fosters agriculture in Osaki Kōdo

Paddy agriculture developed in the Osaki Kōdo<sup>1</sup> region by using *noyachi* (lowland swamps) and wetlands that extend along Eai River and Naruse River as rice paddies. Osaki Kōdo frequently experiences drought, is prone to flooding due to the topographical features of a landscape that rolls down from precipitous mountain areas to low gradient plains, and suffers cold temperature damage caused by the *yamase*, a cold and moist seasonal wind that is unique to the Pacific coast of the Tohoku region. However, since medieval times, the region has performed integrated water management by building intake weirs, irrigation and drainage tunnels and channels, reservoirs, and flood control basins in over 1,300 locations along the Eai and Naruse Rivers, collaborating from upstream to downstream on a diversity of water management technologies for irrigation and drainage that each accommodate different geographic and climatic features as well as climate-related disasters such as floods and droughts. This integrated approach has allowed the ingenious coordinated control of the water required for agriculture.

Such water coordination efforts were performed mainly by *keiyakukō*, local land-based mutual assistance organization among farmers. In times of drought, the bottom-up water users organization established schemes based on exchange and agreement between upstream and downstream farmers to enable the sharing of water –for example, by reusing irrigated water or controlling the water flow by block rotation (“bansui”). Playing an indispensable role in the farmer-led coordination of such sophisticated joint water management, the *keiyakukō* has been continued across the area river basin. The region’s efforts to make improvements in paddy ridges and water irrigation and drainage channels had been unprecedented over one hundred years ago and it has contributed to the maintenance of the rich and diverse Osaki Kōdo.<sup>4)</sup>

As with the saying *naehansaku* (“good seedlings are half the battle”), the region has fought against cold temperature damage caused by the *yamase* winds by



Figure 1-1 Paddy agriculture based on traditional water management system

<sup>1</sup> A widely accepted name that the rich agricultural land of the Osaki area is known by. *Honai-dosan-ko* (Satomi Fujiemon, 1798) says “It is called Osaki Kōto (浩蕩), meaning Vast Osaki, or Kōto (広稲) meaning vast area of rice. There is a particularly large number of paddies and crop fields and the land is very fertile, thereby producing an outstanding amount of rice that cannot be matched by any other region.” The region was known to be fertile land covered with rice paddies. Koto was later changed to Kōdo (耕土), or tilled land.

cultivating strong seedlings that are disease and environment-resistant, as well as by applying diversified agricultural methods that effectively use water like deep-water management (raising paddy water levels to control water temperature).

Furthermore, agriculture in this region is broadly based on tilling land through the joint work of crop farmers and livestock farmers, a tradition continuing from the Edo period (1603-1868) when horse-breeding was popular in the region. This has enabled the production of rice that is resistant to cold temperature damage, such as that caused by *yamase* winds.

People exchanged seeds at markets or at temples and shrines, consequently sharing genetic resources that were adaptive to the cool environment. This practice developed into the cultivation (securement and distribution of seeds) of varieties with higher cold weather resistance and higher yield, led by Miyagi Prefectural Furukawa Agricultural Experiment Station. These efforts have supported local agriculture by creating varieties such as “Sasanishiki” and “Hitomebore”, which have become major Japanese rice varieties today, that support rice production in a region that is constantly hit by *yamase* winds.

Furthermore, this comprehensive local water management system has made not only paddy agriculture possible, but also the production of various agricultural products that support the diet of local people. From early in history, it has supported the production of soybean, which is made into traditional, local fermented foods and non-perishables, including miso (soybean paste used as a seasoning), soy sauce and *natto* (fermented beans), as well as traditional local vegetables, such as *kozena-daikon* (local variety of Japanese radish), *Onikobe-na* (a leaf vegetable), *Matsuyama-seri* (a local variety of Japanese parsley), and *Kamiibano-satoimo* (a local variety of eddo), which are pickled or used as non-perishables to eat during wintertime.

## **b) A unique landscape of rice paddies, “igune,” water channels and reservoirs**

In this region, *igune*, or more commonly, *yashikiran* (homestead woodlands) protected farmers’ houses from floods and northwesterly winds during winter. These woodlands have been conserved from early times to support the residential environment of farmers living amid rice paddies.

In general, *yashikiran* refers to homestead woodlands planted around residences and are sometimes called *yashikimori* (homestead forests). The tradition of *yashikiran* remains in very few regions in Japan. The *igune* is literally like a “mountain of treasure” that provides vegetables and various resources necessary for everyday life.



Photo 1-1 Osaki Kōdo

Moreover, the Sendai feudal domain, which encompassed all of present day Miyagi prefecture, laid great importance in maintaining *igune*, and its first Lord Date Masamune (1567-1653), allowed the

cutting down of trees only by permit. People were required to plant saplings to replace the tree that was cut down in accordance with the size of the original tree. The saplings were grown in a nursery owned by the domain. Thus, the region had already seen an emergence of the idea of mitigation<sup>2</sup>.

An *igune* is composed of a variety of species, including subcanopy trees such as Japanese alders, which can grow in wetlands, cedar, bamboo and hinoki cypress, as well as understory trees. The complex mixture of trees has supported people’s lives. This unique landscape embracing rice paddies, *igune*, channels and reservoirs passed down from the Edo period contributes greatly to the biodiversity of the local paddy field ecosystem where animals including many bird species, frogs, snakes, and dragonflies travel between rice paddies and *igune*.

The *igune* of Osaki Kōdo continues to be a part of the local landscape. When the rice paddies are filled with water during rice-planting season when the seedlings have yet to grow, they create a distinctive landscape with forest islands floating within the wet fields.

The diversity of the landscape of Osaki Kōdo, ranging from the sight of “bōgake”, a local method of drying rice on vertical poles that is rooted in local climatic conditions to herons standing on the paddy ridges, living creatures including red dragonflies and fireflies, and geese travelling between rice paddies and wetlands, is supported by paddy agriculture.



Figure 1-2 General image of the landscape of Osaki Kōdo

### c) The blessings of water and the wetland ecosystem fostered by Osaki Kōdo

With the maintenance of rice paddies and wetlands through an agricultural system adaptive to severe natural conditions, the habitats of frogs and spiders and other animals (indigenous natural enemies) that prey on insect pests are stably maintained, and a symbiotic relationship between rice paddies and living creatures is thus formed. Such relationships are also drawn upon in proactive efforts to control disease and pests and to prepare the soil for organic and environment-friendly rice production, which has come to be widely practiced. These efforts involve deep-water management and the appropriate sprinkling of rice bran on the water surface to control the growth of weeds, thus

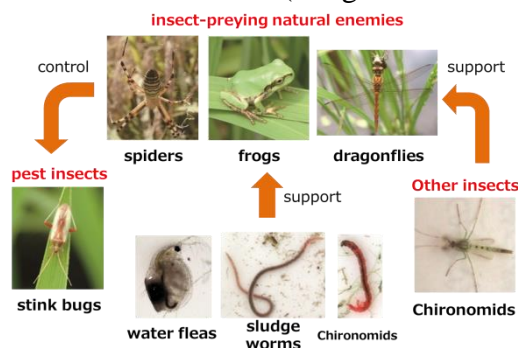


Figure 1-3 Pest control scheme using indigenous natural enemies

<sup>2</sup> Mitigation: actions to mitigate or compensate for environmental impact caused by human activity. A method developed in the U.S. around 1970 to address the rapid reduction of wetlands.

reducing the labor required. Organic and environment-friendly rice production is currently being performed on 3,679ha, contributing to the conservation of rich biodiversity in rice paddies as well as the restoration of water networks that enable organisms to go to and from water channels and rice paddies.

The environment provided by Osaki Kōdo has been found to be home to endangered species listed on the Red List published by the Ministry of the Environment including fish such as *Pseudorasbora pumila pumila* (Japanese common name: *shinaimotsugo*) and *Acheilognathus typus* (Japanese common name: *zenitanago*), amphibians such as *Pelophylax porosus porosus* (Japanese common name *tokyodarumagaeru*) and insects such as *Lethocerus deyrollei* (Japanese common name: *tagame*) and dytiscids.

Furthermore, the local landscape of rice paddies and wetlands supports the wintering of over 100,000 greater white-fronted geese (*Anser albifrons*) that migrate to the region in pursuit of rice husks, as there are few remaining habitats for them. The birds in turn supply organic material in the form of droppings to the rice paddies, another example of the symbiotic relationship with the rice paddies. The Winter-flooded Rice Paddy (*Fuyu-mizu-tambo*) method was launched in 1998 as a pioneering agricultural method that floods rice paddies during the winter in an effort provide rice paddies as roosting sites for the greater white-fronted geese and to support organic farming. Following the lead of Osaki, these efforts have been taken up by other municipalities such as Toyooka City in Hyogo Prefecture and Sado City in Niigata Prefecture, and have gradually spread throughout Japan. This method has proved not only to effectively control weeds in farming, but also to contribute to the formation of richer habitats for organisms overall. Therefore, the Winter-flooded Rice Paddy method in combination with production using reduced pesticides and reduced chemical fertilizer and organic production, supports the biodiversity of rice paddies.

#### **d) The blessings of water and a traditional culture fostered by the Osaki Kōdo**

Osaki Kōdo is home to a fermentation-oriented food culture that makes sake, soy sauce and a type of miso, which is said to be the original form of Sendai Miso, all from local agricultural produce. A *mochi* (rice cake)-eating food culture that serves *mochi* with seasonal foods in accordance with holiday and ritual events flourished and continues today. The region also has a long cultural history of fishing for loaches and crucian carp in the rice paddies, as well as eating the locust living there. People continue to practice agricultural rituals such as “Yanagisawa Yake Hachiman” and participate in folk religion such as “worshiping Funagatayama Mountain (Funagatayama-shinko)”. A *tōji* (hot spring healing) culture has also developed, and people continue to spend days at the hot springs during the agricultural off-seasons to bathe and recover from the fatigue of hard farm work.

In this way, by overcoming severe natural conditions, the region has successfully continued paddy agriculture in the fertile land known as Osaki Kōdo while preserving a rich integrated wetland

ecosystem through a water network connecting channels and reservoirs and the diversified *igune* landscape. This local agricultural system is built on the wisdom to wisely use water under unique challenging natural conditions including the frequent occurrence of three climate events – *yamase* winds, floods and droughts. It is a unique, forward-thinking agricultural system that is globally important for its high resilience against risks and changes imposed upon agriculture and ecosystems by climate change and other social factors.

## 2. Characteristics of the Proposed GIAHS Site

### (1) Food and Livelihood Security

In Osaki Kōdo, food has been secured by adapting to environmental conditions, including cold temperature damage induced by *yamase* winds as well as floods and droughts, which were not always optimal for rice cultivation, by wisely and ingeniously harnessing local water resources. Addressing cold temperature damage was most important in order to secure the food required to survive and to guarantee their livelihoods. Farmers have grown a diversity of crops including soy bean, wheat and vegetables to avoid hunger in times of poor harvest and support their livelihoods through diversified sustenance, not limited to growing rice. This integrated agricultural system supports the continuation of paddy agriculture and enables the sustained production and supply of various agricultural produce centered on rice, which is the staple food of the Japanese and serves as the basis of the Japanese economy and culture.

#### a) The history of paddy agriculture in Osaki Kōdo supported by traditional and ingenious water management

The history of rice production in Osaki Kōdo goes back 2300 years, to the Yayoi period (4th century BC – 3rd century AD). Stone knives, earthenware with marks of unhulled grains of rice, and charred rice have been discovered from 65 archaeological sites. From the Tumulus Period (3rd century–7th century), irrigation channel remains have been found at the Tomenuma and Jizoguruma ruins, and this is believed to mark the beginning of water management. In ancient times, rice production spread with the promotion of the Yamato court’s (6th century-7th century.) immigration policy which encouraged people to move from the Kanto region. Water management schemes are believed to have been developed during this period. It has been recorded in historical literature that by medieval times, water was irrigated from rivers, beginning with the Tatemaie Ozeki weir (1264).<sup>3</sup>

The “ingenious water management system” of Osaki Kōdo originated in the period between the late medieval times to early modern times when Lord Date Masamune took up residence Iwatezawa Castle (currently Iwadeyama, Osaki City) in 1591 and initiated rule.

In the Sendai Domain, the Date family made efforts to turn the floodplains of *noyachi* (undeveloped lowland swamps) and



Photo 2-1 Iwadeyama Ozeki Weir  
(Meiji period (1868-1912))



Photo 2-2 Historical irrigation channel  
(Uchikawa)

<sup>3</sup> Based on data compiled from excavation reports, histories compiled by local governments, and old local documents by local government staff from Osaki City and the four towns in charge of cultural assets in the Osaki region.

wetlands into rice paddies, and implemented measures to solve irrigation and drainage issues by constructing intake weirs, irrigation and drainage tunnels, agricultural irrigation and drainage channels and reservoirs, thus completing a network of rice paddies and channels. Some construction events were recorded as carvings on stones and in historical literature. Examples include, the excavation of the Minamihara Anazeki tunnel (1644-1647) by Yusa Heizaemon in the upstream area of the Eai River, and the excavation of Arakawa-anazeki tunnel (1655) by Okoshi Kiuemon. Yusa Heizaemon's plans covered irrigation and drainage solutions for not only the Eai River but also the entire basin including the Naruse River and sought to build the Arakawa-zeki weir and Semizeki weir (1659-1669), Hara-seki weir (1670-1680) and drainage for Nabirenuma Swamp (1830-1843). Okoshi Kiuemon, who excavated Arakawa-zeki weir, also directed the drainage of Shinainuma Swamp downstream. This presents evidence that wise and ingenious water management schemes covering the entire Osaki Kōdo had been acknowledged and devised from early times when there were no detailed maps. In the upstream area, where many water intake facilities are located, water was taken in from the rivers via the intake weirs and irrigated to the farmland through tunnels and channels; and in the midstream and downstream areas with less available water, many reservoirs were constructed in the hills and the "bansui" system (a scheme limiting the hours or locations of water intake by rotation) was adopted. An ingenious water management scheme was designed in the early Edo period to supply water to the farmland in the basin.

From medieval times to early modern times, water management based on intake weirs and irrigation channels constructed all over Osaki Kōdo creatively protected the local agriculture from natural conditions such as the *yamase* winds and guaranteed farmers their food and livelihood, thereby supporting the development of local agriculture.

Against the backdrop of such agricultural developments, during the times of the Sendai Domain, much of the rice consumed in Edo (present day Tokyo) was supplied from this region, thus supporting the diet of the people in Edo. The "Edo Kaimai-sei"<sup>4</sup> was introduced and contributed to the stabilization of the domain's finances and life in the dominion. The ingenious water management system embracing Iwadeyama Ozeki weir (1591) and "Uchikawa" irrigation channel (which not only took water from the Ozeki weir but also served the purpose of being the outer moat of the castle), which Masamune was directly involved in constructing, as well as other intake weirs, irrigation and drainage tunnels, agricultural irrigation and drainage channels and reservoirs built in the Edo period continue to keep the rice paddies of Osaki Kōdo filled with water. The "*keiyakukō*," outstanding local mutual assistance organizations, continues to take the initiative in retaining conventional networks and irrigation functions through well-managed water distribution and management of channels.

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<sup>4</sup> Edo Kaimai-sei (Edo rice transportation system): The Sendai clan's method of selling rice by purchasing surplus rice from farmers and selling it in Edo. Under the rule of the Osaki family (1413-1548) the local rice was sent as tribute to the capital in Kyoto as "Kinu-hada-mai (silk skin rice)". Amounting to one-third of total consumption in Edo, the rice was called "Hongoku-mai" and used as the index rice for determining rice prices.

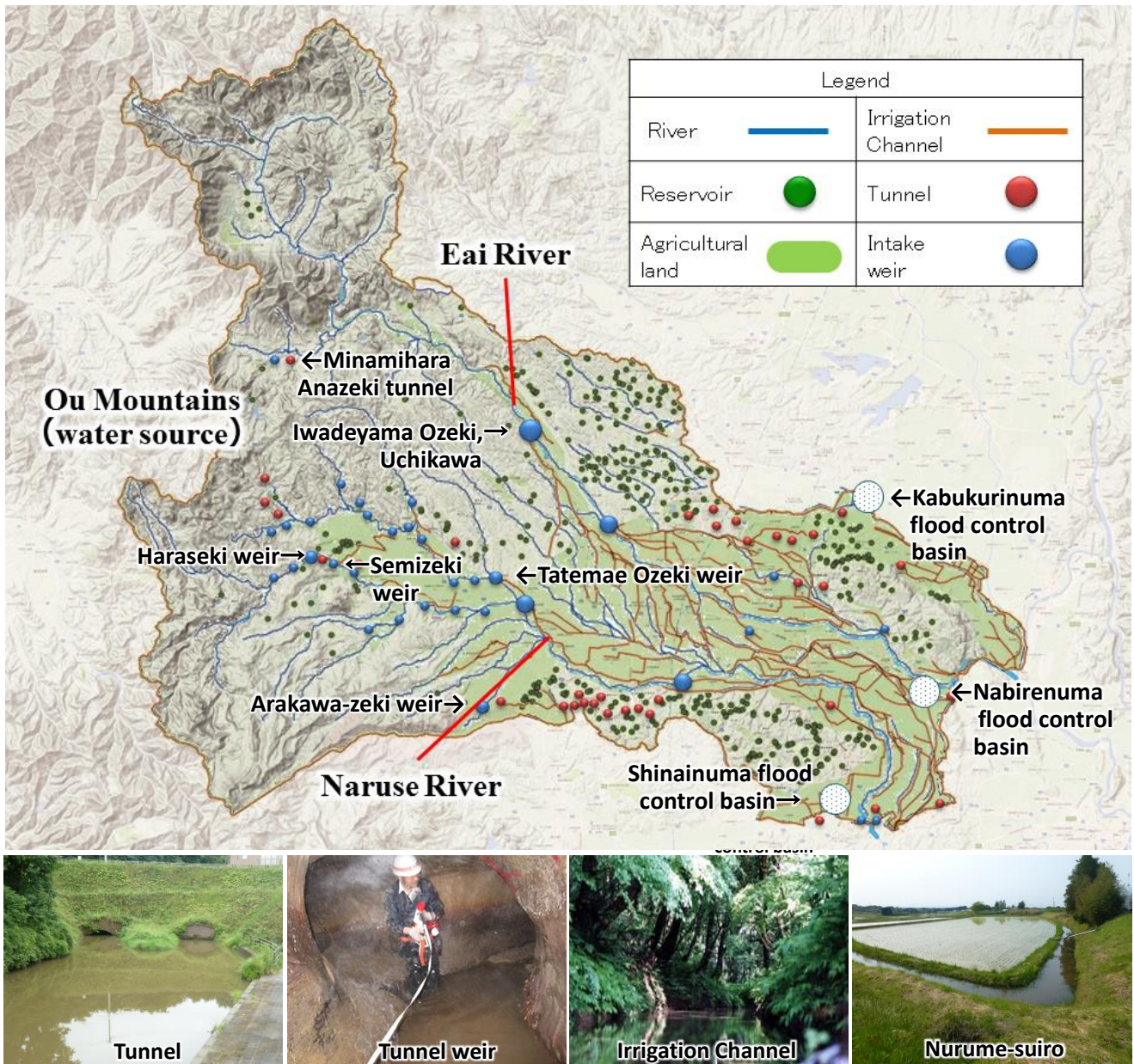


Figure 2-1 Major components of the traditional water management in Osaki Kōdo

### b) A history of paddy agriculture centered on overcoming *yamase* winds

Miyagi Prefecture including Osaki Kōdo, has suffered 117 significant events<sup>5</sup> of agricultural cold temperature damage including those induced by *yamase* winds, frost, heavy rainfall and early winters, since the 17<sup>th</sup> century. This amounts to major crop damage once every four years, or once every three years including floods, diseases and pests. Therefore, addressing cold temperature damage was the priority issue in securing the food required for survival and guaranteeing their livelihood.

In Osaki Kōdo efforts continued to proactively preserve and further develop adaptive technologies for the introduction of cold-resistant rice varieties through the exchange of seeds, variety improvement,

<sup>5</sup> Compiled based only on data on factors of cold temperature damages extracted by the Secretariat from *Miyagi prefecture's land improvement history (1600-1988)* and "The status of cold temperature damage" in *An illustrated introduction to rice production and cold temperature damage in the Tohoku region.*"



seedling cultivation methods (irrigated rice nurseries, protected semi-irrigated rice nurseries), and water management methods during rice cultivation (turning off irrigation in the daytime, deep-water management, installing long channels to give the irrigation water time to warm up). These efforts have led to the development of high quality varieties including “Sasanishiki” and “Hitomebore”, while preserving the rich local paddy agriculture.

While the people of Osaki Kōdo employed adaptive water management technologies to address *yamase* winds, they also developed a spiritual culture in which they prayed with reverence and offered thanks for the blessings bestowed upon them by the natural forces that stood beyond their control. Traditional culture, including local manners and customs such as events for the Little New Year (preliminary celebrations), has been preserved and carried on by local mutual assistance organizations, *keiyakukō*, which plays a core role in the local water management.



Photo 2-3 Yanagisawa Yake-Hachiman

### c) Integrated agriculture centered on rice production

Local farmers have supported their livelihoods through integrated work – a combination of not only rice production but also growing vegetables for the family and processing produce, working in the *satoyama* and *satochi*, such as forestry and charcoal-making, silkworm breeding, horse breeding (producing farm horses to plough the fields and carry lumber down from the mountains) and making wooden crafts for daily use.

Approximately 20% of the labor force population<sup>5)</sup>, or 20,451 people, still engage in integrated agricultural practices centered on rice production today. 7,185 commercial farm households rely on



Photo 2-4 Family-based farming

profits from agricultural produce sales. Moreover, small farm households with under 10ha of farmland account for 97%<sup>6)</sup> and family-run farms represent 94%<sup>1)</sup> of the total. On the other hand, the aging farming population and lack of successors has led to community-based group farming, where members cooperatively engage in farming is also rising in popularity. Therefore, we see that diversified forms of farming, with the majority family-based, are presently supporting the local agriculture.

In the case of rice in particular, consumer organizations, such as consumer cooperatives have led the “Sanchoku” movement since the 1980s. The region was the first in Japan to foster various styles of sales and distribution through communication and information exchange with consumers and consumer organizations as well as biological field surveys. This has led to stable sales of rice and other agricultural produce. The adjustment of irrigation and drainage under a traditional water management system has enabled the cultivation of various crops other than rice. In addition to soy bean and wheat,

vegetables such as scallions, tomatoes and Chinese cabbages as well as flowers such as chrysanthemums, pears and other fruit and traditional vegetables such as the *Kozena-daikon*, *Onikoube-na*, *Matuyama-seri*, and *Kamiibano-satoimo*, are grown in fields close to the *igune* (residence). The harvested produce is saved in case of rice failure due to *yamase* winds, floods or droughts, and as non-perishables to use during the wintertime when the ground is covered with snow and crops cannot be grown. These additional crops, along with rice, guarantee local livelihoods.

Comprehensive crop-livestock farming is also popular in this region. The breeding of beef cattle, dairy cows, pigs and egg-laying hens contribute to stable farm operations. Animal manure are made into compost and returned to the farmland as an important organic resources that support the fertile soil of Osaki Kōdo.

Furthermore, in Osaki Kōdo, which is exposed to a strong northwesterly wind, rice is dried under the sun using a traditional method called “bōgake” that involves hanging the straw radially around a pole. The “bōgake” method allows the rice to dry slowly, thus generating benefits in terms of quality, creating few cracked grains and improving the flavor in the after-ripening process.



Photo 2-5 “Bōgake” method for drying rice

Table 2-1 Status of agricultural production <sup>7)8)</sup>

Crop name	Area of production	Amount produced	Crop name	Area of production	Amount produced
Rice	19,550ha	106,810 tons	Lettuce	11 ha	151 tons
Wheat	798 ha	3,173 tons	Scallions	159 ha	2,658 tons
Soy beans	3,807 ha	7,157 tons	Onions	37 ha	869 tons
Daikon radishes	110 ha	2,820 tons	Cucumbers	76 ha	1,657 tons
Carrots	27 ha	316 tons	Eggplants	62 ha	852 tons
Potatoes	112 ha	2,323 tons	Tomatoes	43 ha	1,355 tons
Eddo	18 ha	117 tons	Buckwheat	92 ha	12 tons
Chinese cabbages	94 ha	2,445 tons	Japanese pears	15 ha	311 tons
Cabbages	50 ha	943 tons	Chrysanthemums	1,392 a	3,711 thousand
Spinach	106 ha	1,042 tons			

#### d) Expansion to related industries

During the Edo period, retainers were granted “chigyō” (territory) , or land in various locations of a region. Castle towns developed around a retainer’s residence and attracted rice cracker manufacturers, sake breweries and straw crafts manufacturers, as well as local industries manufacturing miso, soy sauce, tofu and *natto* (fermented soy beans), which contributed to the local economy and employment. In particular, brewing industries, including sake, miso and soy sauce manufacturers, expanded greatly by using locally grown rice and soy bean, thereby promoting collaboration among the agricultural,

commercial and industrial sectors. The region is home to 11 sake breweries, 8 miso manufacturers and 4 *kōji* (rice malt) manufacturers, all contributing to the boosting of value added by processing rice and soy beans.

Furthermore, paddy agriculture has used various byproducts without putting them to waste. The straw made by drying rice on vertical poles (“bōgake”) was used as cow feed and bedding as well as for various daily goods, such as rice bales, ropes, mattresses, Japanese sandals, the backside of *tatami* mats, ornaments for shrine rituals, and cooking fuel. These products were also sold at local markets to gain profit. Many have been replaced with chemical products today, but the special skills required to weave straw crafts and straw ornaments for shrine rituals have been locally preserved by passing them down within farming households and districts.

Table 2-2 Sendai miso<sup>6</sup> manufacturers

Name of company	Year of establishment
Kamata Shoyu	1830
Yoneki Honten	1835
Chubachi Miso Shoyu-ten	1868
Natori Miso Shoyu-ten	1873
Konno Jozo	1903
Kawakei Jozo	1909
Teshirogi Shoyu-ten	1910
Sendai Miso Shoyu	1919 ※Moved factory to Matsuyama (Osaki City) in 1998

Table 2-3 Sake breweries

Name of company	Year of establishment	Brands
Ichinokura	1755 *changed company name in 1973 due to business merger	Ichinokura
Tanaka Shuzo-ten	1789	Manazuru
Hashihei Shuzo-ten	1790	Tamanoo, Odaebashi
Asakan Shuzo-ten	1819	Yoimai
Niizawa Shuzo-ten	1873	Atago-no-matsu, Hakurakusei
Miyagi Furusato Shuzo	1874	Kosui, Arai
Moritami Shuzo-ten	1883	Moriizumi
Kanbai Shuzo	1918	Miyakanbai
Nakayu Sake Brewery	1906	Narusegawa, Mugen
Yamawa Shuzo-ten	1893	Washigakuni
Kawakei Shoten	1902	Kogaenezawa

<sup>6</sup> Miso manufactured according to the recipes and standards stipulated in the “Honba Sendai Miso Toitsu Shikomi Yoroyoi (Authentic Sendai Miso Manufacturing Standardized Manufacturing Guide)” determined by the Miyagi Prefecture Miso and Soy Sauce Industry Cooperative Association is called “Sendai Miso (registered brand)”.

## (2) Agro-biodiversity

### a) Agriculture in symbiosis with the wetland ecosystem of rice paddies

The ingenious water management system not only contributes to conserving the genetic resources of various crop plants including rice and conserving the diversity of organisms that inhabit the wetland ecosystems that rice paddies are home to, but also helps promote agricultural practices that are in symbiosis with nature through the pest-controlling functions of wetland ecosystems.

The river basin of the Eai and Naruse Rivers before the Edo period was a floodplain with *noyachi* (undeveloped lowland swamps) and wetlands. It is believed to have been home to various aquatic organisms dependent on the rich wetland ecosystem as well as animals that preyed on them. The paddy agriculture system of Osaki Kōdo enabled the use of the floodplain as rice paddies, controlling the water with human hands. Land use and water use based on the seasonal waterfronts and wetlands created by paddy agriculture has guaranteed farmers food and livelihood and preserved the biodiversity of the wetland ecosystem.

#### i) A wetland ecosystem fostered by paddy agriculture

The agricultural system of this region conserves a rich wetland ecosystem through the mosaic land use of secondary nature – the water-based network of channels and reservoirs along the Eai River and Naruse River and *igune* (homestead woodlands). Major channels are filled with water every year and this rich water environment conserves the wetland ecosystem throughout the year.

Rice production in an environment where *yamase* winds frequently cause cold temperature damage is reliant on adjusting the water level of the rice paddies and channels in order to adjust the water temperature. This water management also contributes to creating environments suitable as habitats for organisms dependent on wetland environments. The channels are inhabited by Japanese rice fish (*Oryzias latipes*) and loaches (*Misgurnus anguillicaudatus*) and other freshwater fish that prefer slow water flows. As Figure 2-2 shows, rice paddies are home to a wide variety of organisms, including numerous microorganisms living underground, as well as sludge worms, chironomids, spiders, dragonflies and other insects, frogs and

other amphibians, and herons and other birds. Complexly interacting with each other as predators and prey, they form a closely linked ecosystem. The wetland ecosystem centered on rice paddies provides habitats for valuable living creatures – 12 fish species including the *Pseudorasbora pumila pumila* (Japanese common name: “Shinaimotsugo”), the *Acheilognathus typus* (Japanese common name:



Photo 2-6 Spider webs covering the rice paddy



Photo 2-7 Egrets pursuing organisms in the rice paddy

“Zenitanago”), and Japanese rice fish; four amphibian species including the *Pelophylax porosus porosus* (Japanese common name: “Tokyodarumagaeru”) and the *Hynobius lichenatus* (Japanese common name “Tohokusansyouuo”); and insect species such as the *Lethocerus deyrollei* (Japanese common name: “tagame”) – that are listed as endangered species on the Red List published by the Ministry of the Environment.

Furthermore, from autumn to winter, the rice paddies of Osaki Kōdo become feeding grounds for over 100,000 greater white-fronted geese and the bean goose, a subspecies, that fly to the area from Siberia. This is largely due to the fact that the flood control basins of Kabukurinuma and Kejonuma provide winter roosting spots and that a vast area of rice paddies, which provide the rice hulls that they feed on, and has been continued over a long period of time. Also, because the rice harvest in September through October is followed by a soy bean harvest in November and December, the geese can continue to find food.

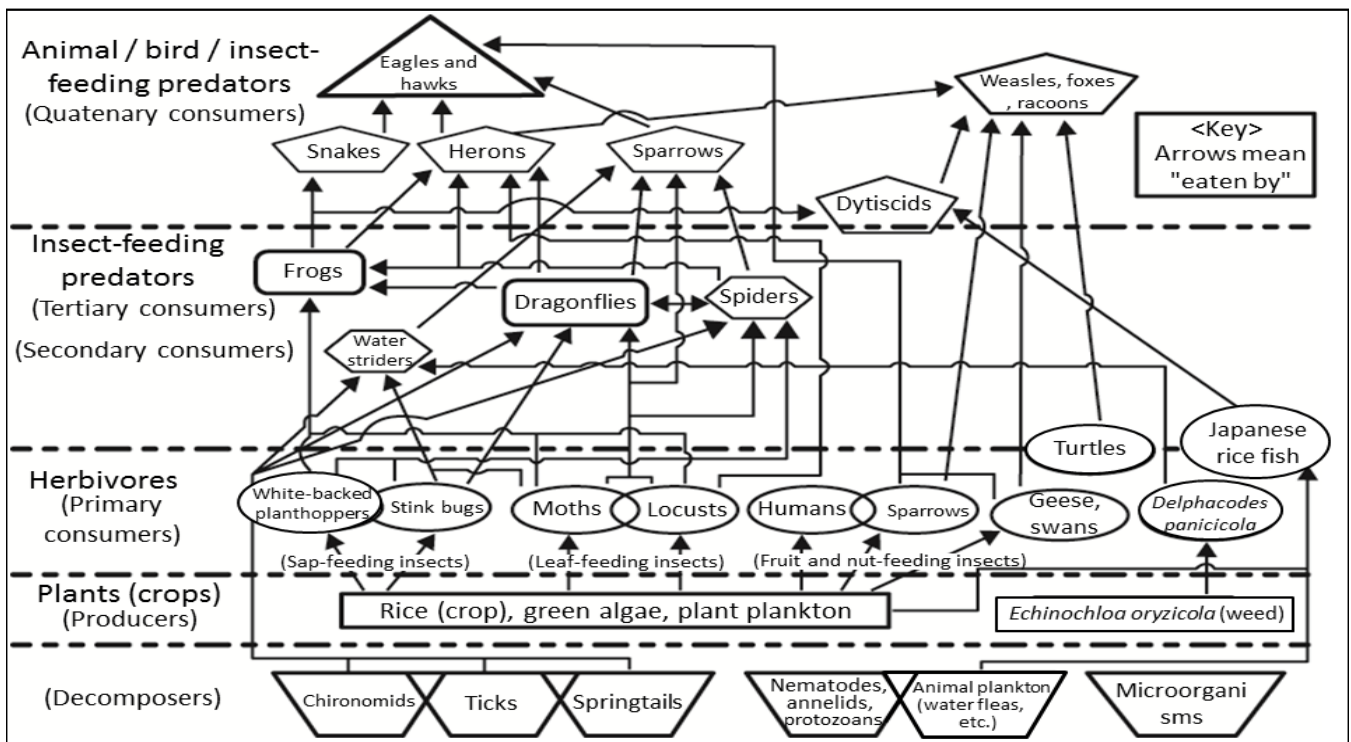


Figure 2-2 Relationship between organisms in the rice paddies of Osaki Kōdo (compiled based on material by NPO Tambo)

ii ) **Biodiversity and a symbiotic relationship with agriculture**

The wetland ecosystem of Osaki Kōdo not only provides good habitats for a wide variety of organisms but also fosters indigenous natural enemies that could effectively control rice paddies pests; thus it is closely associated with the local agriculture.

For stable agricultural production, farmers need to apply an appropriate amount of rice bran to the water surface to reducing the

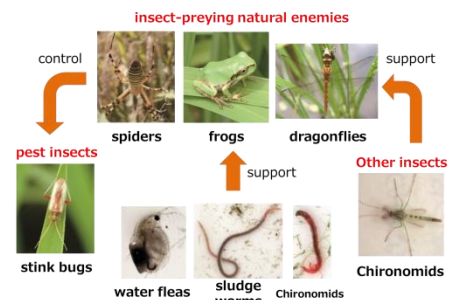


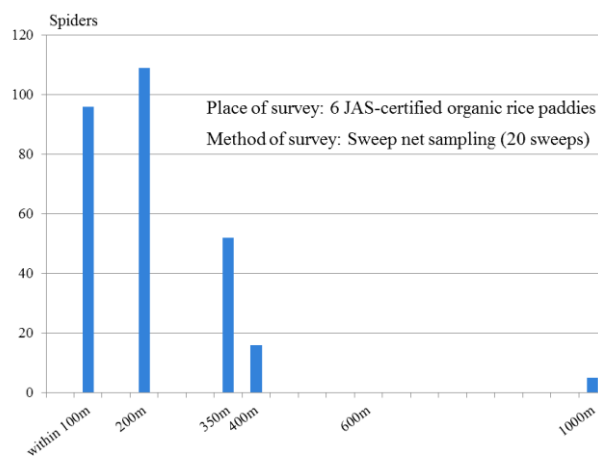
Figure 2-3 Pest control scheme using indigenous natural enemies

amount of farm labor required and properly control pests or reduce the damage suffered. While the application of pesticides is becoming mainstream, organic and environment-friendly rice farmers are spearheading the introduction of pest control harnessing indigenous natural enemies, thus forging a symbiotic relationship between living creatures and agriculture.

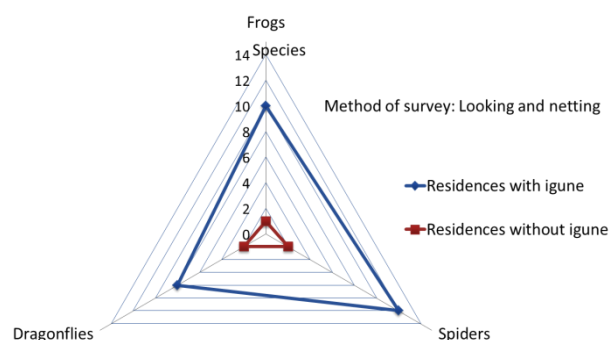
Various indigenous natural enemies can be effective in wet rice cultivation, and thus studies and practice in this region are currently focused on pest control based on coexistence with frogs, spiders and dragonflies.

As Figure 2-3 shows, indigenous natural enemies like frogs, which are obvious predators, have been proven to prey on insects. The slow water flow of the channel network covering the rice paddy area, the still water environment<sup>7</sup> of reservoirs, unique cultivation methods adaptive to *yamase* winds, and the *Satoyama* environment of *igune* cattered in the landscape like “forests floating in the rice paddy,” collectively form a unique landscape that fosters distinctive ecosystem functions that can be applied for pest control. Rice paddies close to a *igune* tend to have a large population of *Tetragnatha* spiders, natural enemies of plant bugs; pests to rice crops.<sup>9)</sup> Frogs and dragonflies, which also prey on pest insects inhabit the *igune* as well. Therefore, the addition of the *igune* to a landscape of rice paddies, channels and reservoirs creates an agricultural ecosystem featuring rich biodiversity.

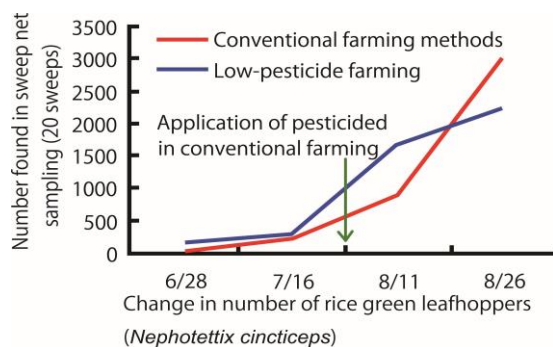
These pest control methods harness ecosystem functions to reduce the damage caused by pests and agree with the concept of resurgence, where overdependence on pesticides reduces useful insects, which are natural enemies of the target pest, and consequently increase the number of pests. Using evidence from investigations of the



Graph 2-1 Number of *Tetragnatha* spiders caught by distance from *igune* (compiled based on Osaki City Report on the Study on Participatory Monitoring Methods<sup>9)</sup>)



Graph 2-2 Comparison of frequency of appearance of natural enemies around houses with and without an *igune* (compiled based on Osaki City Report on the Study on Participatory Monitoring Methods<sup>9)</sup>)



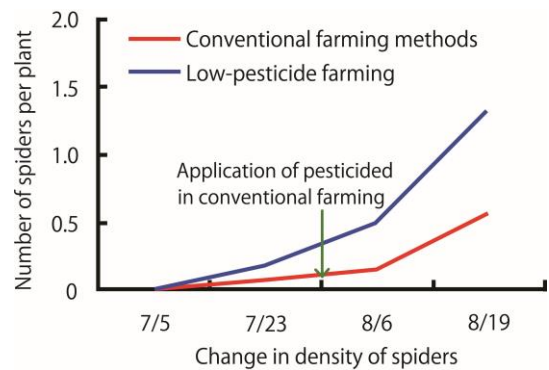
Graph 2-3 Difference in pest populations according to cultivation method (compiled based on a report by Miyagi Prefectural Furukawa Agricultural Experiment Station<sup>10)</sup>)

<sup>7</sup> A water environment with a flow so slow that the flow is imperceptible to the human eye. Lakes, ponds, marches.

relationship between pest populations and pesticide application<sup>10)</sup> combined with efforts to restore water networks that enable organisms to travel between channels and rice paddies, agricultural cooperatives and NPOs are holding seminars on cultivation and biological field surveys to spread ecosystem-based pest control.

Furthermore, organic cultivation methods that enhance biodiversity increase the sludge worm population and activity. The floating feces and soil gradually accumulate to form a sludgy layer of soil that has proved to have weed control effects, thus supporting organic and environment-friendly rice production methods that maintain biodiversity.<sup>8</sup>

Furthermore, by harnessing the water-retaining functions of rice paddies, the “Winter-flooding Water Paddy (*Fuyu-mizu-tambo*)” method, a life-friendly agricultural method enhancing biodiversity and ecosystem services is practiced over a total area of approximately 30ha. Cooperation among farmers, companies, an NPO and local government is working to expand this effort.



Graph 2-4 Difference in population of natural enemies due to cultivation method (Miyagi Prefectural Agricultural Experiment Station<sup>10)</sup>)

## b) Agricultural diversity





In Osaki Kōdo, efforts have been continued over the long-term to select and cultivate cold-resistant varieties that could tolerate cold temperature damage induced by *yamase* winds. Even today, Miyagi Prefectural Furukawa Agricultural Experiment Station regularly conducts studies on cultivating varieties for cold regions, including the popular and savory “Sasanishiki” and “Hitomebore.” Efforts continue to secure varieties that can tolerate even colder climates.

Also, the genetic resources of traditional local vegetables, such as *Kozena-daikon*, *Onikoube-na*, *Matsuyama-seri* and *Kamiibano-satoimo*, which match the local climate and support people’s lives along with rice have been preserved through continued cultivation and seed gathering. These vegetables are suitable for preservation as fermented foods or underground storage during snowfall, and have thus played an important role in securing food to survive the long and severe winters and constitute a part of the rich local food culture.

Furthermore, since vegetables of the *Brassicaceae* family such as the *Kozena-daikon* face a high risk of intercrossing, farmers and a local seed and nursery company have collaborated to conserve genetic resources. They have taken effective approaches to preserve for future generations the genetic resources of traditional vegetables that we may risk losing.

<sup>8</sup> The effects of the Winter-flooding Water Paddy method: birds feed on weeds and their seeds, thus effectively controlling weed growth and sharing a symbiotic relationship with rice production.

Table 2-4 Major traditional vegetables

Name	Description	Name	Description
<p>Kozena-daikon</p> 	<ul style="list-style-type: none"> <li>○Cultivation area: Kozena district, Onoda, Kami Town</li> <li>○Features: a type of Japanese radish with small roots Cultivation period: mid-Aug. – mid-Oct.</li> <li>○Use: only leaves and stems are used in soups and Japanese pickles</li> </ul>	<p>Onikoube-na</p> 	<ul style="list-style-type: none"> <li>○Cultivation area: Onikoube district, Naruko Hot Springs, Osaki City</li> <li>○Features: a type of Brassica campestris, similar to the turnip. Cultivation in the Onikoube district gives it a unique flavor. Cultivation period: Aug.-Nov.</li> <li>○Use: Stems, leaves and roots are all edible pickled in salt</li> </ul>
Name	Description	Name	Description
<p>Matsuyama-seri</p> 	<ul style="list-style-type: none"> <li>○Cultivation area: Matsuyama, Osaki City</li> <li>○Features: Unique scent and crispness Cultivation period: Sep.-Mar.</li> <li>○Use: Japanese pickles, soups</li> <li>○Cultivation information:</li> </ul>	<p>Kamiibano-satoimo</p> 	<ul style="list-style-type: none"> <li>○Cultivation area: Kamiibano district, Sanbongi, Osaki City</li> <li>○Features: Seed potatoes are preserved by family. Subject to replant failures (can only be grown once in three years in the same field). Cultivation in this district gives it a unique stickiness. Cultivation period: Apr.-Oct.</li> <li>○Use: Can be cooked in various ways. Can be stored underground during winter.</li> </ul>

### c) Efforts towards sustainable food supply and guaranteed livelihood

In recent years, paddy agriculture in this region has struggled with a number of concerns: low rice prices due to increased surplus rice as a result of increased rice yield and changes in diet, dependency on pesticides and chemical fertilizers, dwindling farming village communities as a result of declining village populations due to aging and declining the agricultural population, reduction in paddy agriculture, and the continuation of the traditional water management system maintained through collaboration as well as the symbiotic relationship with wetland ecosystems maintained through rice production.

In response to these social risk factors, the region has raised awareness of the importance of food safety, consumer trust and biodiversity, practiced organic and environmentally-friendly rice production with consideration for pest control methods that enhance symbiotic relationships with organisms, engaged consumers in exchange with producers based on partnership between city residents and NPOs and introduced biological field surveys. Trust has

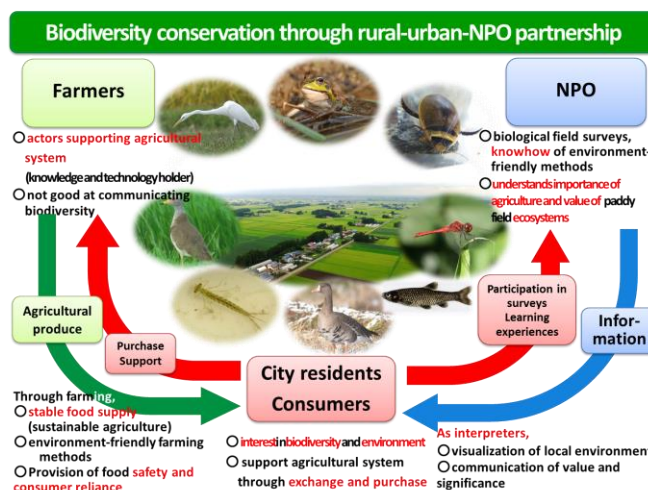


Figure 2-4 Biodiversity conservation through partnership among farmers, city residents and NPOs



been forged through producer-consumer exchange and a new distribution system built on mutual support has been established. These efforts have been supported by paddy agriculture and the richness of the biodiversity fostered. They are important examples that demonstrate the direction in which we should take the agricultural system in order to pursue sustainable agriculture.

### **i ) Ensuring the continuity of agriculture through partnership among consumers, NPOs and companies**

“Winter-flooded Rice Paddy Rice” made using the Winter-flooded Rice Paddy method, “Shinaimotsugo Sato no Mai” produced as a result of activities to conserve the endangered *Pseudorasbora pumila pumila* (Japanese common name: “Shinaimotsugo”), and the “Naruko no Kome Project Yukimusubi” have been made possible through the participation of not only farmers but also non-farmers, city residents (consumers), companies and civic organizations such as NPOs. Partnerships have been forged through communication and information exchange to achieve mutual understanding as well as joint farm work and surveys. Efforts are supported by consumers who understand the meaning of each initiative and are thus not influenced by fluctuating market prices but are willing to pay a sustainable price.

#### **i ) - i Mutually supportive urban-rural exchange**

Naruko Onsen district, Osaki City, located in the westernmost part of the region is cold and receives short hours of sunlight. Therefore, it had been unsuccessful in growing rice varieties like Sasanishiki, which have been fostered for cultivation on the plains. In order to overcome such circumstances, local farmers, non-farmers and Miyagi Prefectural Furukawa Agricultural Experiment Station joined forces to launch the “Naruko no Kome project”.



Photo 2-8 Exchange with consumers in the Naruko no Kome project

Under this project, a savory rice variety called “Yukimusubi” that grows well in the local climate was selected, and through forging a mutually visible producer-consumer relationship and discussions on ideals of agricultural production, the rice was purchased for a sustainable price. This is an example of CSA (Community Supported Agriculture) that is supported by consumers, agricultural communities and farmers alike. The project has taken another step forward to preserve traditional local culture by serving *onigiri* (rice balls) in wooden bowls made by a local artisan specializing in making *oke* (wooden pail) or by dedicating a *Kagura* (Sacred Shinto dance).

#### **i ) – ii Producer-consumer partnership through biodiversity conservation**

Amid increased concerns for food safety and consumer trust led by consumer cooperative, efforts to directly connect producers and consumers were launched in 1982. This movement is widely known as the “Sanchoku” movement. Farmers and consumers deepened mutual understanding through

communication and information exchange and collaborated to support the cultivation environment-friendly rice by purchasing such agricultural products for a sustainable price.<sup>11)</sup> The “Sanchoku” movement gathered momentum for pesticide and chemical fertilizer-free production and organic production. Conventional producer-consumer exchange has been expanded to include activities such as monitoring the biodiversity of rice paddies through “Surveys on Lives in Rice paddies and Surrounding Environments” that promotes understanding of the importance of the biodiversity that rice paddy farming supports and thus promotes paddy agriculture with sustainability perspectives. These efforts have resulted in the undertaking of wet rice cultivation applying less than half of conventional amounts of pesticide and chemical fertilizers (including organic production and pesticide and chemical fertilizer-free production) over an area of 3,679ha.



Photo 2-9 Sanchoku efforts focused on communication with consumers. (Survey on Lives in Rice Paddies and Surrounding Environment)

**i) – iii Paddy agriculture and partnership with companies that support biodiversity**

Local agriculture and biodiversity is also proactively supported through partnership with a local company (local sake brewery). A local sake (rice wine) brewery employs traditional fermentation techniques to brew Japanese sake with Winter-flooded Rice Paddy Rice, a brand of rice locally and organically grown with the aim of achieving a symbiotic relationship between agriculture and the conservation of migrating birds such as the geese that migrate to the Osaki region. Furthermore, a portion of the profits from sake sales is donated to an NPO to explicitly demonstrate the value of wetland ecosystems found in rice paddies and to support conservation efforts.

Such efforts by local companies not only support local farmers by purchasing their rice, but also enhance the value of the rice by applying a traditional and local fermentation technique and further support conservation efforts through the profits. They form a model that draws on local strengths.

**i) – iv NPO-farmer partnership through the conservation and restoration of reservoirs**

The *Pseudorasbora pumila pumila* (Japanese common name: Shinaimotsugo), discovered in Shinai-numa swamp (Kashimadai, Osaki City), is a fish species that represents the local fauna and yet it is listed as an endangered species, since the aging and decline of the farming population have caused difficulties in managing the reservoirs that are their habitats. Therefore, an NPO and farmers joined forces to perform management operations such as dredging habitat reservoirs, and thus conserving their habitat environment. Furthermore, the NPO is engaged in a rice-branding scheme known as the “Shinaimotsugo Sato no Mai” rice certification program,” which certifies that the water used in producing the rice comes from reservoirs that are inhabited by a diversity of living creatures, including



Photo 2-10 Winter-flooded Rice Paddy Sake

*Pseudorasbora pumila pumila*, and that have been proved to have high water quality. These efforts represent valuable wisdom that promises to formulate a model that balances biodiversity conservation and the sustainability of agriculture that enables reservoir management.

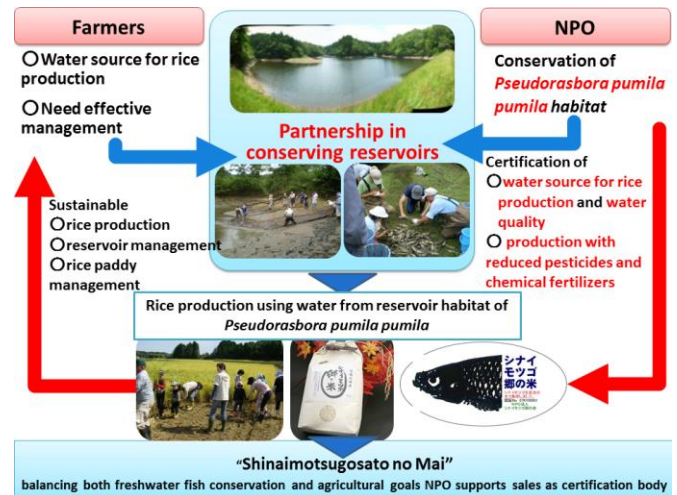


Figure 2-5 NPO-farmer partnership centered on a reservoir

## ii ) Efforts to engage citizens in biological monitoring

“Surveys on Lives in Rice paddies and Surrounding Environments” are performed nationwide and have become an established method to learn about the multidimensional functions of agriculture, including the safety of agricultural produce and consumer trust as well as biodiversity conservation.

In this region, efforts have been made to further develop biological field surveys proactively led by organic or environment-friendly rice producers, organizations that receive payment for activities to enhance multi-functionality and city residents (consumers) and shift to collaborative monitoring by citizens and consumers.

Also, to encourage the participation of more local residents in biological field surveys on the secondary nature that they are most familiar with - rice paddies, irrigation channels, reservoirs and forests surrounding houses such as *igune*, indicator organisms and a survey manual unique to the region have been developed

reflecting the local wetland ecosystem, based on *Indicator Animals of Functional Agrobiodiversity: A Survey and Evaluation Manual* (Ministry of Agriculture, Forestry and Fisheries). By compiling historical data from monitoring and adding evaluations conducted by NPOs with expertise, stronger links will be developed among agricultural systems, the symbiotic relationship between biodiversity and ecosystem functions and food safety and consumer trust. Efforts are underway to harness this as basic data to communicate the value and significance of the agriculture and agricultural produce of Osaki Kōdo.

The form is titled "Indexes of fauna Evaluation of Biocultural Diversity Evaluation Sheet". It includes a "Certification Indexes of Biocultural Diversity Fauna & Flora" logo. The form has fields for "Place of survey", "Date and Time", and "Name of Investigator". It features a table with columns for "Category of Indicators", "Living Matters for Indicators", and "Score". The table lists indicators such as Spiders, Dragonfly, larva, Grasshoppers, Tubifex, Shellfishes, Crustacea, Frogs, Inland fishes, and Water beetles and water bugs. A radar chart is used to visualize the scores for these indicators. Below the table is an "Evaluation" section with a table showing score ranges and corresponding evaluation grades (A, B, C, D). There are also two prompts for the investigator to write about their survey experience.

Category of Indicators	Living Matters for Indicators	Score
Indicator for avoidance of agricultural chemicals	1. Spiders	
	2. Dragonfly, larva	
	3. Grasshoppers	
Indicator for quality soils	4. Tubifex	
	5. Shellfishes	
Indicator for scenic landscape of TAMBO	6. Crustacea	
	7. Frogs	
	8. Inland fishes	
	9. Water beetles and water bugs	
Total Score		

Evaluation	Totak Score	Evaluation
	X > 8.0	A
	6.0 ~ 7.9	B
	4.0 ~ 5.9	C
	X < 3.9	D

Figure 2-6 Implementing and spreading monitoring by various actors

#### **d) A landscape with flying birds, including geese, preserved through paddy agriculture**

The traditionally continued practice of paddy agriculture has allowed rice paddies to play the role of feeding grounds for migrating Greater White-fronted Geese (*Anser albifrons*), a national natural monument, which feed on gramineous plants growing in wetlands. Particularly in this region, an environment that embraces a combination of the rice paddies of Osaki Kōdo that serve as feeding grounds and wetlands, including the flood-control basin Kabukurinuma and reservoir Kejonuma, which support the local agriculture as the basis of traditional water management, paddy agriculture has been maintained through tireless efforts. These areas have been registered as Ramsar sites<sup>9</sup> for their significance as a valuable place that may save migratory Greater White-fronted Geese from extinction, as their population has once drastically decreased in Asia.

Ramsar COP10 in 2008 adopted Resolution X.31; Enhancing biodiversity in rice paddies as wetland systems, referring to a Winter-flooded Rice Farming derived from Osaki Kōdo as a good case focusing on a role of rice paddies contributing to maintain biodiversity. That recognizes values of agro-biodiversity of rice paddies. (Refer to Attachments 10.)

During the Tempo years (1830-1843) of the Edo period, a haiku poet of the region (currently Wakuya Town), Kudo Roin also composed about birds in his haiku: From my hands, a Black-crowned Night Heron (*Goisagi*) flies against the spring moon. Therefore, birds constitute a familiar part of the local landscape. The Japanese people are particularly fond of geese, which are commonly seen in the region, and they have celebrated the sight of flying geese in Japanese poems and paintings as a traditional feature of the Japanese landscape. Appreciated in *tanka* in *The Tales of Ise*, which is believed to have been written before the Heian period (794-1185), and also appearing in the paintings of *Ukiyoe* artist Utagawa Hiroshige of the Edo period, geese are birds that represent the Japanese landscape.

Excerpts from *The Tales of Ise*:

“Fireflies flying in the sky, if you are flying above the clouds, tell the geese that the autumn wind is blowing.”

“Autumn when geese cry and chrysanthemums bloom is wonderful too, but the coast of Sumiyoshi is indeed a pleasant place to live in springtime.”

The sublime sight of geese flying out in early morning or flying back to roost is breathtaking. The landscape produced by the local biodiversity has been maintained largely by paddy agriculture, while in other regions such landscapes are disappearing.

Historical channels including Uchikawa, which runs from Oseki weir in Osaki City’s Iwadeyama and the outer moat flowing from Semizeki weir in Miyazaki-cho, Kami Town, still inform us today of the atmosphere of the Edo period.

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<sup>9</sup> Kabukurinuma (registered as Kabukuri-numa and the surrounding rice paddies) was registered in 2005. Kejo-numa was registered in 2008.



Photo 2-11(above)Moon and geese  
Figure 2-7 (left) *Ukiyoe*: Moon and geese (Utagawa Hiroshige)

### (3) Local and Traditional Knowledge Systems

The region is exposed to a cold and moist seasonal wind known as the *yamase* that blows from the Okhotsk High during the rainy season and has suffered frequent cold temperature damage, counting 117 climate-related crises<sup>12)</sup> including cold temperature damage since 1600. As Figure 2-8 shows, looking from the Pacific Ocean, the region is located in between the Kitakami Plateau and Abukuma Mountains, and is thus strongly influenced by this seasonal wind. During the Edo period, drastic drops in yield caused by cold temperature damage induced by *yamase* winds resulted in several periods of famine. 13)14)

Under such severe natural conditions, our ancestors engaged in efforts to adapt to the local climate, utilizing local water resources to grow cold-resistant seedlings, managing the water during the rice growing phase and securing seeds that would enable even the smallest amount of increased yield in a cool climate.

Moreover, by preparing the soil mainly by applying manure, local farmers have grown rice resistant to *yamase* winds and have thus stabilized yield.

Furthermore, vegetables and other daily foods that are as indispensable as rice to a farmer's life are grown in fields that are unsuitable for paddies in the *igune*, woodlands surrounding the house, and preserved underground or by making pickles in preparation for the winter. The local sustenance and livelihood has been supported by local and traditional knowledge.

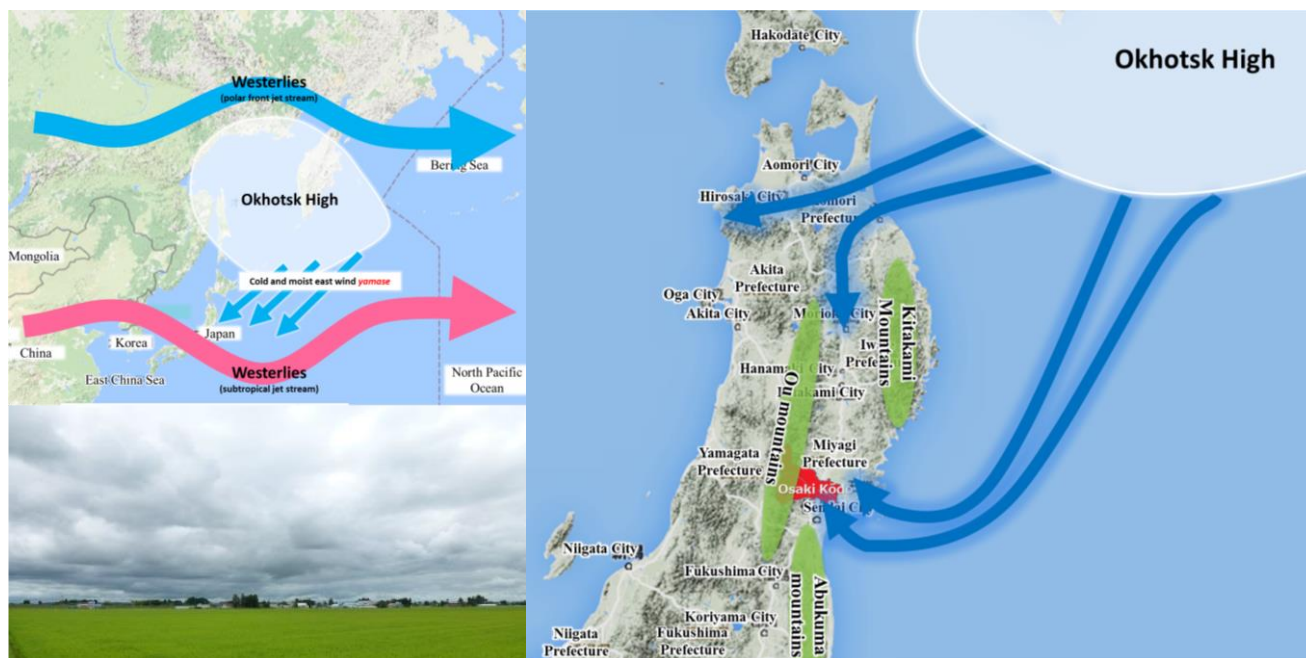


Figure 2-8 (left upper & right) Flow of seasonal winds resulting from topographical features and development of *yamase* winds  
Photo 2-12 (left bottom) a view of the skies when *yamase* winds are developing

#### a) Wisdom in paddy agriculture: traditional and ingenious water management

As Figure 2-9 indicates, the current paddy agriculture system is an achievement obtained through a combination of improved technologies but also myriad lessons shared among local people since the

16th century. The people have practices paddy agriculture by addressing *yamase* winds and droughts through elaborated water use and responding to floods by employing flood-control basins throughout the agricultural production cycle.

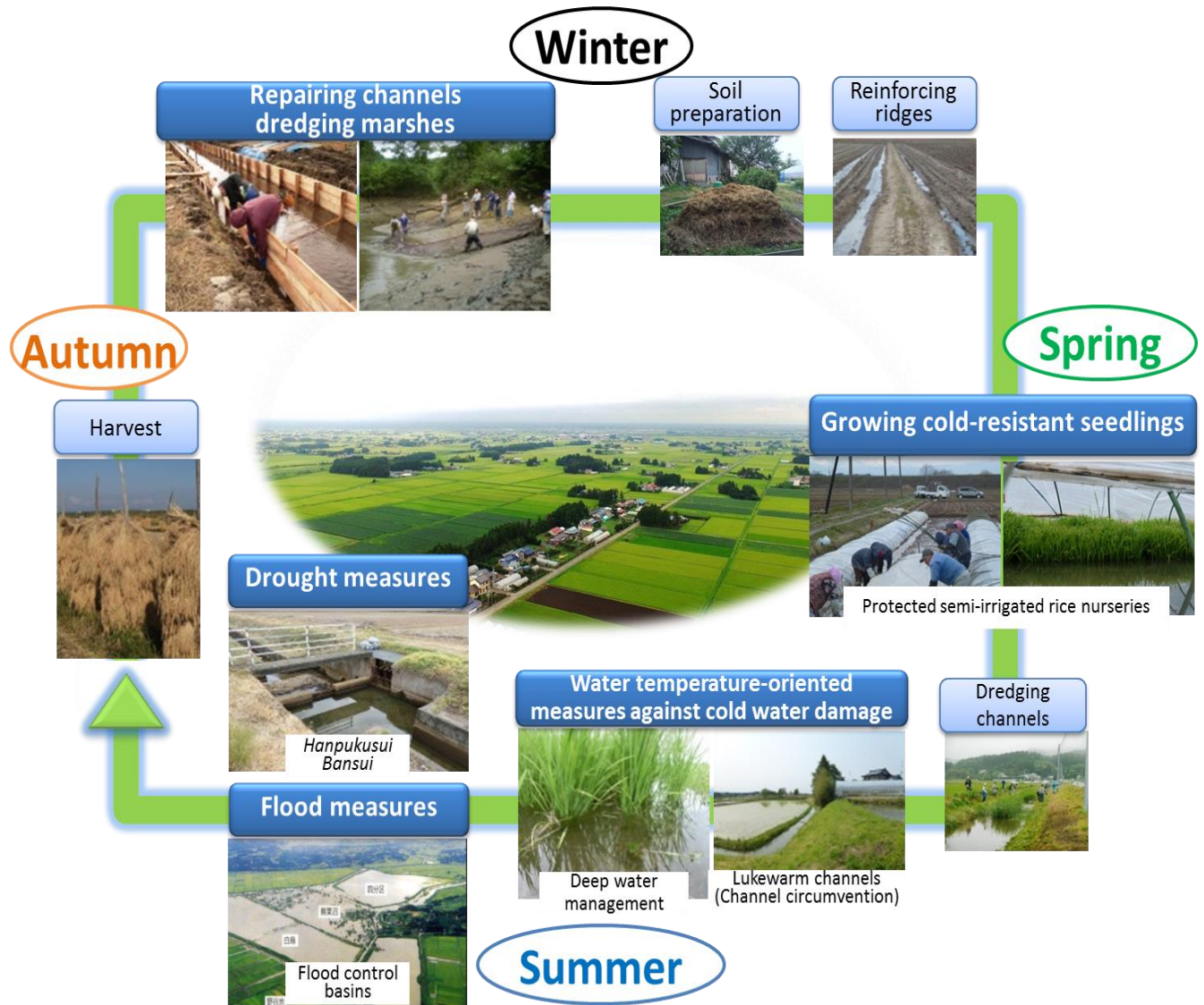


Figure 2-9 Paddy agriculture based on traditional water management system

i) **Network of traditional water management covering the entire basin**

By installing infrastructure to take water and distribute it evenly across rice paddies, Osaki Kōdo’s early water management system dating back to medieval times enabled the use of the area’s floodplains, including its wetlands and lowland swamps, as rice paddies. Developments were made through early modern times to take water at weirs along the water-abundant Eai River and Naruse River and deliver it to rice paddies by gravity flow. In the upstream area with relatively easy access to water, and thus many division facilities, water was taken from the rivers at weirs and delivered to the farm land through tunnels and channels. In the midstream and downstream areas, where water became less available, many

reservoirs were built in the hills to stock the water from upstream. Using a system of 37 intake weirs, 30 tunnels, channels extending over a total of 6,000km, and 1152 reservoirs, water was stably supplied. On the other hand, an effective drainage system was managed by both enhancing tunnel-based drainage and harnessing flood control basins.

The region also harnessed the natural gradient in its multilayered water management system from upstream to midstream and then downstream.

In the upstream mountainous area of Eai River, tunnels were excavated by drilling a hole in the mountain manually and excavating tunnels in the mountains to supply irrigation water for mountainous areas. The cold water is naturally made warmer before it enters a paddy field by employing ingenious techniques such as “nurume suiro (lukewarm channel: a channel used to avoid irrigating cold water directly from the stream)” and “nurume ta (lukewarm rice paddy: in some mountainous areas, entire rice paddies are used to warm up the water.)” that let the water divert around the paddy field. In the midstream area, weirs are employed to reuse irrigated water, and weirs and reservoirs were used for the elaborated intake of water. In the downstream area, the dual use of tunnels for both irrigation and drainage enabled the effective water management to use lakes and swamps as rice paddies.

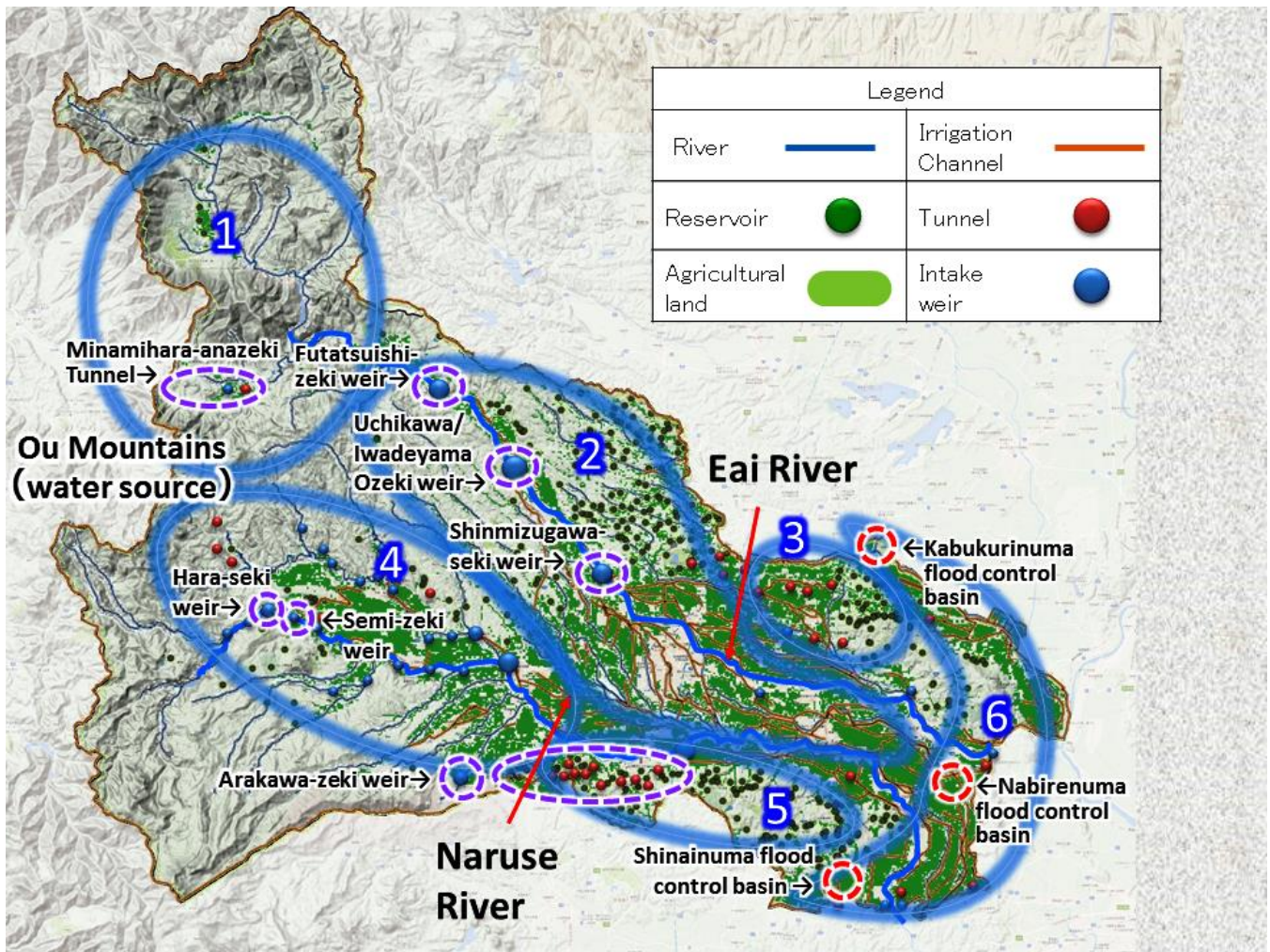
In the upstream area of Naruse River, a combination of careful water intake from reservoirs, water distribution via tunnels and water reuse harnessing the geographic features of an alluvial fan are performed. In the midstream hills, mountain channels deliver water to hilly farmland and reservoirs. In the downstream area, people secured drainage routes by using a network of naturally flowing channels following the natural gradient served as secure drainage routes, while they also implemented sophisticated water use, including the reuse of drainage overflows as “hanpukusui” and “bansui” (block rotation).

In the lowest part of the basin of both rivers where the land is almost flat, flood control has been performed using both natural flood control basins and rice paddies, which potentially serve as flood control basins in times of flooding.

Hence, this region has developed a unique water management system that can be used both for irrigation and drainage according to topographic and climatic conditions by utilizing tunnels and the water channel network covering the basin. This system has helped to continuously preserve paddy agriculture in Osaki Kōdo.

In addition, afforestation and forest conservation activities upstream in the water source area contribute to maintaining a rich water supply and providing building material and fuel.





	Traditional and ingenious water management system		
	Features of water management	Rice crop damaging factors	Wisdom regarding water management
Eai River basin	① Mountainous area securing irrigation water and using “nurume-suiro”	<ul style="list-style-type: none"> <li>• Securing irrigation water</li> <li>• Adapting to cold temperature damage</li> </ul>	<ul style="list-style-type: none"> <li>• Using tunnels for water management for mountainous areas</li> <li>• Making “nurume-suiro” channels to treat cold water</li> </ul>
	② Gently inclined area with a naturally flowing water channel network	<ul style="list-style-type: none"> <li>• Adapting to drought</li> <li>• Securing irrigation in low-gradient areas</li> <li>• Adapting to cold temperature damage</li> </ul>	<ul style="list-style-type: none"> <li>• Establishing a gravity flow-based water channel network along a gentle slope</li> <li>• Using “hanpukusui (recycled water),” or reusing “ochimizu” (drained water)</li> <li>• Sophisticated water use employing the “bansui” block rotation scheme (limiting water intake by rotation)</li> </ul>
	③ Wetland area using tunnels for both irrigation and drainage	<ul style="list-style-type: none"> <li>• Switching from irrigation to drainage in the event of floods</li> <li>• Adapting to cold</li> </ul>	Turning lakes into rice paddies by using tunnels for both irrigation and drainage ※ Sending water to Kabukurinuma (Multiple uses, including as the largest

		temperature damage	wintering area for geese in Japan)
	⑥Low plain area using rice paddies as flood control basins	<ul style="list-style-type: none"> <li>Adapting to floods (low-gradient)</li> <li>Adapting to cold temperature damage</li> </ul>	<ul style="list-style-type: none"> <li>Flood control basins (natural flood control basins + using rice paddies as flood control basins)</li> <li>Using flood control basin for multiple purposes, including as the largest wintering area for geese in Japan (Kabukurinuma flood control basin)</li> </ul>
Naruse River basin	④Alluvial fan area using weirs, reservoirs and recycled water	<ul style="list-style-type: none"> <li>Securing irrigation water in the alluvial fan area (managing flow speeds)</li> <li>Adapting to drought</li> <li>Adapting to cold temperature damage</li> </ul>	<ul style="list-style-type: none"> <li>Elaborate intake of water via weirs and reservoirs</li> <li>Harnessing slopes to reuse water</li> <li>Using tunnels for water distribution</li> </ul>
	⑤Hilly area using irrigation tunnel networks to supply water to farmland and reservoirs	<ul style="list-style-type: none"> <li>Securing irrigation water for reservoirs in a small water catchment area</li> <li>Adapting to cold temperature damage</li> </ul>	Managing irrigation water to supply water to farmland and reservoirs in hilly areas (digging tunnels and channels on the hillside)

Figure 2-10 The traditional and ingenious, multi-layered water management system of Osaki Kōdo  
 ~A basin-wide system based on local characteristics~ (Refer to Attachments 5.)

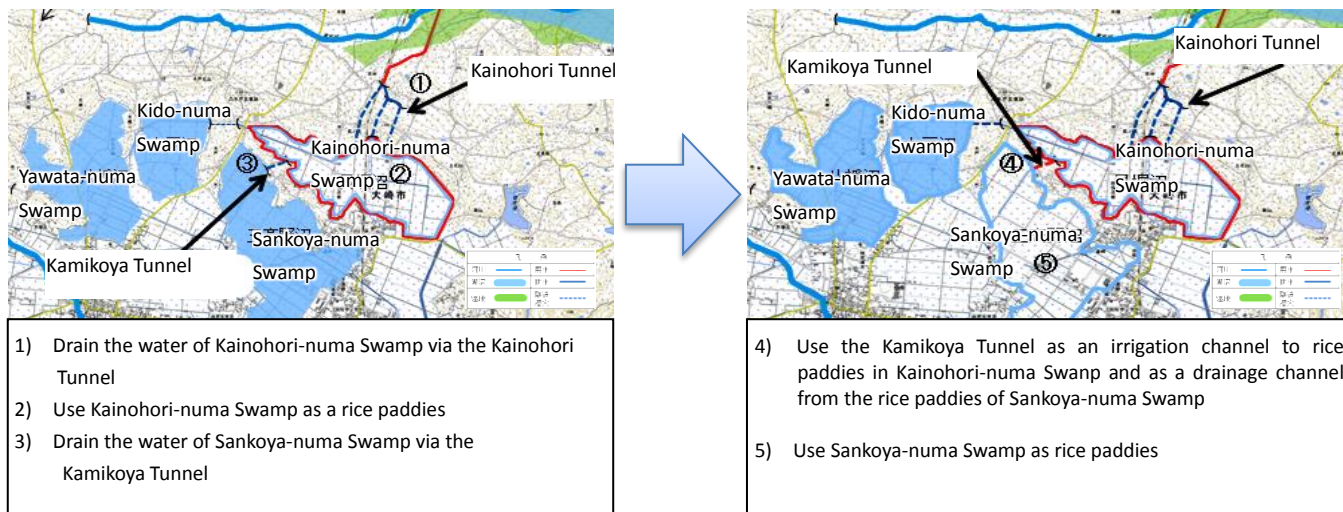


Figure 2-11 Use of wetlands as rice paddies and wisdom to use tunnels for irrigation and drainage

## ii) Flexible water management using flood control basins (Kabukurinuma, Shinainuma and Nabirenuma)

Multiple natural rivers run through Osaki Kōdo, with the larger ones being the Eai and Naruse Rivers. These rivers provide the water for the paddies. However, as the inclination of the downstream basin being 0.0004 degrees, the area is geographically inclined to experience massive flooding in typhoons or concentrated rainfall. Along the Naruse River, 17 major house-damaging floods have

occurred during the 140 years from the Meiji period (1868-1912). In the downstream area, people have enjoyed the blessings of nature, engaging in agriculture and fishing in rice paddies. When the area is hit by a major flood, taking advantage of the fact that rice is relatively resistant to flooding, flood control basins are secured so that the flood water can be guided into some of the rice paddies and save the villages and other rice paddies from flood damage. Hence, damage is reduced through flexible water management that draws on the characteristics of rice paddies. The flood control basins of Kabukurinuma, Shinainuma, and Nabirenuma continue to bear the conventional functions of receiving overflow during major floods.

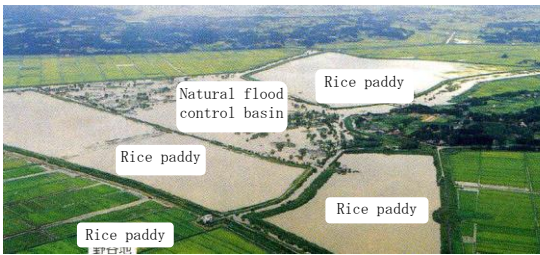


Photo 2-13 Kabukurinuma flood control basin (Osaki City)

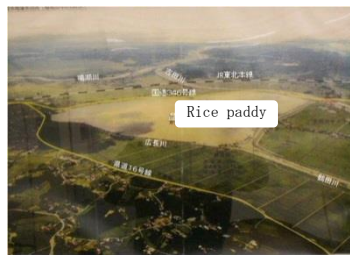


Photo 2-14 Shinainuma flood control basin (Osaki City)



Photo 2-15 Nabirenuma flood control basin (Misato Town, Wakuiya Town)

Furthermore, Kabukurinuma comprising both a natural flood control basin and also rice paddies used as flood control basins, is a registered Ramsar site and is the largest wintering site in Japan for greater white-fronted geese (*Anser albifrons*), a national natural monument, requiring both rice paddies as feeding grounds and wetlands for roosting. It should also be especially noted that together with another Ramsar site, the Kejonuma, a local reservoir, the rice paddies feed 100,000 greater white-fronted geese. They represent the multipurpose use of an ingenious water management system.

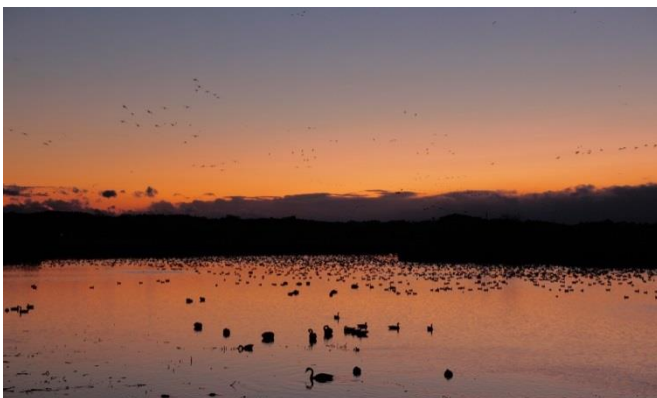


Photo 2-16 Flood control basin Kabukurinuma, where 100,000 greater white-fronted geese winter



Photo 2-17 The wintering of greater white-fronted geese supported by the local agricultural system

### iii) Network of farmer-led joint water management based on *keiyakukō*

In Osaki Kōdo a farmer-led water users organization rooted in *keiyakukō* was established to perform sophisticated water management including balancing the conflicting interests of upstream and downstream and the distribution of water among villages. Droughts that occur in accordance with

annual changes in weather have been addressed through methods including “bansui”, block rotation shifting from simultaneous and continuous flow to a rotational and intermittent flow pattern, and “hanpokusui,” damming drainage water for reuse as irrigation water. Meticulous water management has led to a stable water supply. The management cost and labor has been shouldered by farmers themselves.

These local adjustment functions developed into the Water Management Association and Flood Prevention Association from around 1890, and have been succeeded by Land Improvement Districts, which address water management over wider areas. End-use water management is jointly conducted at the village level based on connections among *keiyakukō*. This multilayered management scheme contributes to the stable use of water resources while adapting to changing severe natural conditions.

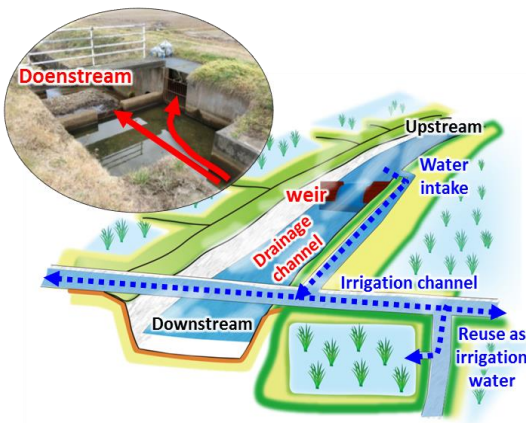


Figure 2-12 Reusing “hanpokusui” from upstream

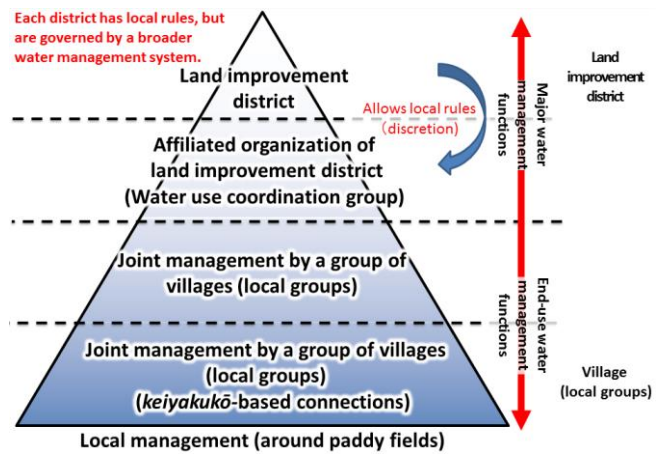


Figure 2-13 Multilayered water management in Osaki Kōdo

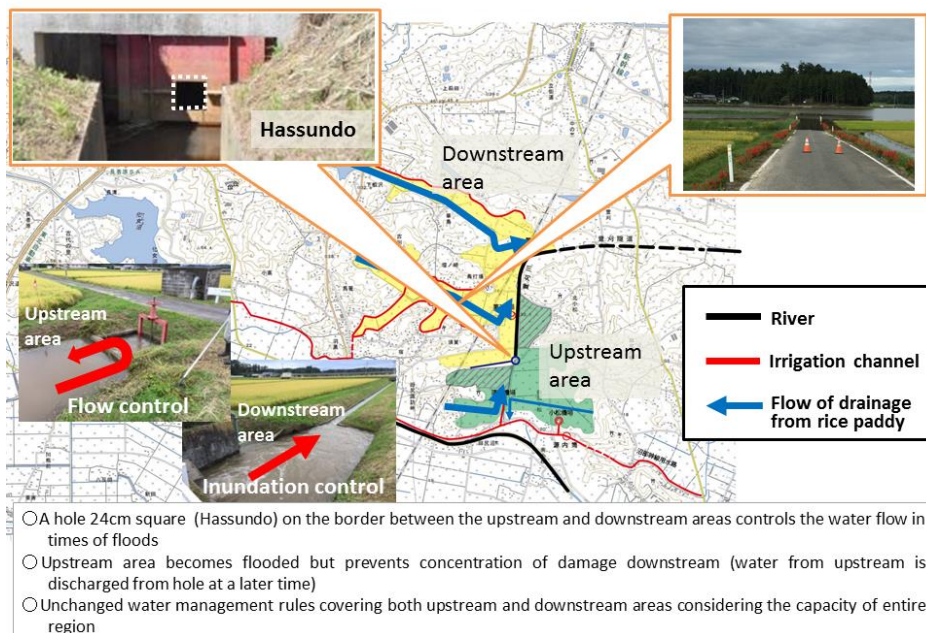


Figure 2-14 Water management rules upstream and downstream using tubes

#### iv) Joint efforts in conserving irrigation channels, biological field surveys and festivals

In this region, villages engage in proactive efforts to conserve farm land and water-related facilities by weeding and dredging channels. Other than biological field surveys, environment-friendly fishways and wooden channels are also being built. By proactively inviting not only farmers but local residents to participate in joint work, traditional undertakings such as festivals and holy rituals are also being preserved.



Photo 2-18 Joint activities by farmers and local residents

#### v) International cooperation to share water management technology

The region has successfully made paddy agriculture possible through ingenious water management based on strong relationships among farmers. It has developed a sustainable water management system led by farmers that adjusts the water flow in times of flood or drought.

Asian and African countries have built water management facilities with funds from international organizations and assistance from developed countries to support paddy agriculture, but are now challenged with the development of an organizational structure for continued maintenance of the infrastructure. As the farmer-led water management system of this region is a very informative model for these countries, the region has welcomed trainees from overseas (China, Malawi, Afghanistan, Uganda, etc.) and has endeavored to spread its sustainable water management system and technologies based on the initiative of local farmers.



Photo 2-19 On-site training of Water Management Organization from Uganda

#### b) Overcoming *yamase* winds to make rice

Tireless efforts were made to secure seeds that would adapt to a cold climate and land conditions. The “Sasanishiki” brand was developed as a rice variety that had the high yield features of “Sasashigure”. Later, “Hitomebore” and “Tohoku 194<sup>10</sup>” were developed as new varieties with highly improved cold-resistant features.

Furthermore, slow temperature change and cultivation techniques to prepare the soil using compost served to adapt crops to cold temperature damages cause by *yamase* winds

##### i) Exchange of rice seeds and developing cold-resistant varieties

Osaki Kōdo has continued to select and develop cold-resistant rice varieties that can adapt to cold temperature damage caused by *yamase* winds.

At Konpo-ji Temple (Wakuya Town), rice seeds were exchanged until the 1970s in association

<sup>10</sup> Tohoku 194 is produced as “Sasamusubi (Osaki City, Wakuya Town, Misato Town) and “Sasayutaka” (Shikama Town, Kami Town)

with an agricultural ritual. Seeds were empirically selected through growing cold-resistant varieties and traded at markets, temple and shrines. Furthermore, in order to stably grow and secure varieties that adapt to cold climate, Miyagi Prefectural Agricultural Experiment Station has collected 120 varieties since 1905, <sup>15)</sup> including 67 varieties collected from local farmers and 53 varieties from the Tohoku and Hokuriku regions to build a distribution system for new cold-resistant seeds and stock seeds based on comparative tests<sup>16)</sup> and pure line selection. Seeds are distributed to farmers, thus supporting stable agriculture.

Even today, at Miyagi Prefecture Furukawa Agricultural Experiment Station, new rice varieties for cold regions are continually being developed using a cold-water paddy for cold resistance tests. In addition to major brand varieties such as “Sasanishiki” and “Hitomebore” it has developed 42 non-glutinous varieties, one sake rice, and 4 glutinous varieties. Further efforts are underway to secure varieties that can tolerate even colder climates.

## ii ) Traditional water management in rice paddies

With rice growing in Osaki Kōdo, where farmers face the risk of cold temperature damage due to *yamase* winds, it is said that “good seedlings are half the battle” implying how important it is to grow strong and healthy seedlings. Therefore, up to the 1960s, seedlings were grown in “toshi-nawashiro” (nursery beds used only to grow seedlings and are not used for growing rice afterwards) or “mizunawashiro<sup>11)</sup>” (irrigated nursery beds) in a corner of a rice paddy. Advancements have been seen in associated technology: heat retention technologies were used to speed up seedling growth, then protected semi-irrigated rice nursery technologies<sup>12)</sup> developed into pool nursery technologies, in which pools are installed in greenhouses where mature seedlings<sup>13)</sup> are grown just as they would be in a nursery, only in an environment with little temperature change. Pool nurseries expose seedlings to few diseases, and have come to be widely used as a “pesticide reduction technology” among organic farmers and farmers using reduced pesticides and chemical fertilizers, thus supporting agricultural ecosystems.



Photo 2-20 Toshi-nawashiro

Improvements / development



Photo 2-21 Protected semi-irrigated rice nurseries

Improvements / development



Photo 2-22 Pool nurseries

<sup>11</sup> nursery beds used only to grow seedlings and are not used for growing rice in order to allow the soil capacities to recover and to grow strong seedlings

<sup>12</sup> A seedling-growing method combining irrigated nurseries, non-irrigated nurseries and protected nurseries

<sup>13</sup> Leaf age of 4.0 to 5.0.

Technologies introduced at the rice growing stage include delaying the rice production period, letting the water taken from the weir divert around the paddy field to avoid cold irrigation water from directly entering the rice paddy (“nurume-suiro” or “mawashi-suiro”), stopping irrigation during the daytime and irrigating the fields only in the morning and at night in order to protect the rice from cold temperatures brought by the *yamase* wind and cold irrigation water (“hiruma-tome-mizu”) and harnessing water temperatures in deep-water management.

Farmers also popularly soak seeds in a “kadoppa,” a washing place in the irrigation channel close to the house or in the “seed pond” on the premises after the spring equinox, using the water temperature to speed up germination.



Photo 2-23 Deep-water management harnessing water temperatures

### iii) Soil preparation through recycling local resources

In early modern times when rice growing became popular, farmers made compost by fermenting a mixture of grass from the local woods or grass cutting area, cow and horse manure and straw. The region has been one of Japan’s leading horse producers<sup>14</sup> since the 16<sup>th</sup> century and horses were used not only to carry harvested crops but also for manure. Because livestock breeding was widely accepted in this region, 1357 livestock businesses<sup>1)</sup> mainly breeding milk cows, beef cattle and pigs can be found. For a long time, rice farmers and livestock farmers have cooperated to effectively use organic material in soil preparation. In recent cold summers, rice paddies to which compost was applied and soil preparation was conducted proved to have better yields. <sup>17)</sup>



Photo 2-24 Soil preparation using compost

Such soil preparation fosters decomposers and sledge worms, which are at the bottom of the rice paddy agricultural ecosystem and support the ecosystem pyramid.(see p13, Figure 2-2)

### c ) Human resource development for the preservation of paddy agriculture knowledge and technology for future generations

The agricultural system of this region has been preserved and passed down by farmers and farmer organizations. Beginning in the 20th century this has also been supported by research activities conducted by public laboratories and research institutes as well as guidance and promotion activities by promotional organizations.

The Osaki region has also been focused on fostering next-generation leaders of local agriculture who will contribute to the preservation,

<sup>14</sup> The use of horsepower for farming and putting organic material in agricultural land is referred to in “Bokuchiku M35-0074” (Miyagi Prefectural Archives)

dissemination and development of technologies. Three agricultural high schools, namely Kami Agricultural High School (1922), Kogota Agriculture and Forestry High School (1896) and Nango High School (1940), are located in the area from upstream to downstream. In addition to general agricultural education, the schools continue to support the preservation of the local agricultural system from a human development perspective by offering classes on climate, teaching cultivation techniques effective in the cold climate of Osaki Kōdo and training instructors of local agriculture and farmers.<sup>18)19)20)</sup>

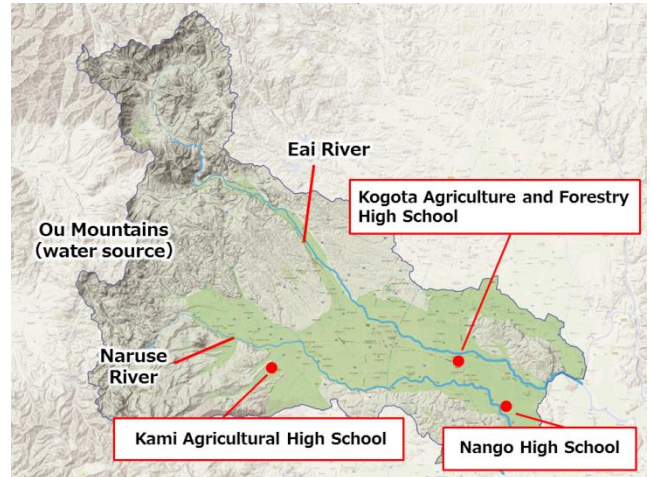


Figure 2-15 Location of agricultural high schools in the Osaki region

#### d) Contribution to human welfare and quality of life

In this region, the local government and 6 NPOs have joined forces to foster children with an awareness of environmental conservation through activities to get better acquainted with the local environment. Named the “Osaki Ikimono Club”, children not only perform biological field surveys but also gain a better understanding of how secondary nature is maintained by human activity by learning about agriculture and the water management system that supports the agricultural system, *Satoyama* management and tree thinning in the mountains. It has a curriculum (maximum duration of nine years) to foster “interpreters” who can communicate this knowledge and enjoys the participation of children from throughout the region, regardless of whether they are from farming households.



Photo 2-25 Activities of the next-generation education program “Osaki Ikimono Club”

Furthermore, environmental education is being implemented with a wider perspective through collaboration with other local governments engaged in “Coexistence with living creatures in the rice paddies and agriculture” (Sado City, Niigata Prefecture, Toyooka City, Hyogo Prefecture, Oyama City, Tochigi Prefecture) and educational institutions including Tokyo University, Tohoku University and Miyagi University of Education.

These efforts promise to become model programs to foster next generation actors who can



preserve and pass on the value of human activities that support agricultural systems and the global environment.

#### **e ) Creating local, national and global economic and environmental goods and services for local communities and society as a whole**

The reduction of wetland environments, which are important sources of ecosystem services, has been noted as an issue of concern in Environmental White Papers; and wetland conservation and the establishment of broad networks (ecological networks) are called for. In this region, a land use mosaic created by a water-oriented network of rice paddies, *igune* scattered in the rice paddies formed and maintained by the local agricultural system, channels, and reservoirs continues to provide abundant ecosystem services.

The world faces the common issues of agriculture-related water resources and soil erosion and degradation induced by agriculture. This region has traditionally established an ingenious water management system operated under the initiative of local farmers and farmer organizations with their roots in the mutual assistance organization, *keiyakukōs* . In the early days after the Great East Japan Earthquake occurred, *keiyakukō* effectively drew upon their reciprocal functions in sharing food and fuel and proved their strong disaster response.

Furthermore, the region has maintained and preserved the local agricultural system by connecting institutional capital, including a water management system that appropriately uses the natural capital that generates ecosystem services. Such institutional capital can be applied in other regions of Japan by gaining an understanding of existing local resources and associated management systems as well human and local relations, reconstructing them in a reorganized form. It is also important that this is done.

#### **i ) Landscape-based coexistence with the environment**

As a result of a traditional water management system that enabled paddy agriculture and the maintenance of livelihoods in a climate with frequent cases of cold temperature damage caused by *yamase* winds and a region that experiences frequent floods and droughts because of a gradual incline, Osaki Kōdo has developed a unique landscape that support farmers livelihoods and lives as well as a rich ecosystem through mosaic land use embracing channels carrying the blessings of water, rice paddies and *igune* scattered in the landscape like forests floating in the rice paddies. The mosaic land use based on an ingenious water management system contributes to the conservation of rich biodiversity and provides a habitat for frogs, spiders, dragonflies and other indigenous natural enemies of pests.

Osaki Kōdo has harnessed this symbiotic relationship between agriculture and the ecosystem, promoting the spread of environment-conserving agriculture. In recent years, Miyagi Prefectural Furukawa Agricultural Experiment Station, Tohoku University and NPOs have encouraged farmers, through demonstrative research, to employ Integrated Pest Management (IPM) to control

pesticide-resistant organisms and to widely accept the concept of “resurgence”<sup>21</sup>), whereby reducing the natural enemies of pests in pest control will consequently increase pests in the future; thus, local farmers have become more and more enlightened. Practicing IPM to further promote agricultural methods harnessing natural enemies will contribute significantly to balancing both sustainable agriculture and biodiversity. Furthermore, the functions of the rice paddies in this region were acknowledged by the Ramsar Convention, and “Kabukurinuma and the surrounding rice paddies”<sup>15</sup> became the first region of “rice paddies,” as explicitly indicated in its title, to be registered as a Ramsar site. It has played an important role in communicating to the world that paddy agriculture can help conserve various ecosystems and provides a diversity of organisms habitats through human activity, as well as being a model to follow for other sites with rice paddies.

## **ii ) Support through collaboration with local administration and welfare**

The region is also a leading example of Payment for Ecosystem Services (PES). Noting the agricultural ecosystem conservation function of the Winter-flooding Rice Paddy method, the local government supported the extra costs required for irrigation water during winter in what used to be Tajiri Town. This example became a model case for including “winter-flooding” as an item of direct payment for the environment<sup>16</sup>, thus contributing to enhancement of the ecosystem conservation functions of rice paddies.

Collaboration between agriculture and welfare is also being pursued and the local agriculture sector is proactively hiring the disabled. More farmers are growing environment-friendly rice to produce value-added products.

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<sup>15</sup> “Kabukurinuma and the surrounding rice paddies” was registered as a Ramsar site at the Ninth Ramsar Convention Conference of the Contracting Parties in 2005 in Uganda

<sup>16</sup> The program also provides grants to wet rice farmers practicing winter-flooding and using reduced pesticides and chemical fertilizer and does not strictly follow the concept of the winter-flooding rice paddies method that is based on pesticide-free and chemical fertilizer-free farming.

#### (4) Cultures, Value Systems and Social Organizations

In Osaki Kōdo, paddy agriculture has continued despite challenging environmental conditions including cold temperature damage induced by winter snowfall and *yamase* winds and river floodings, fostering strong social organizations among the local people and developing an agriculture-based culture of nature-worshipping folk beliefs such as the worship of the Ōu Mountains, as well as agricultural rituals, folk beliefs and folk performing arts performed to pray and to express thanks for a successful harvest, and diverse traditional local cuisine, including *mochi* and fermented foods.

Such local culture has been preserved and passed down from generation to generation, fulfilling different roles as agriculture and agricultural society evolved from medieval times to present, and continue to support the local agricultural system today.

##### a) The *keiyakukō*, mutual assistance organizations supporting local agriculture

The *keiyakukō* is a social organization that supports the activities of local farming villages. Strong land-based reciprocity for mutual assistance in agriculture, replacing roofs, weddings and funerals written out in contracts and bylaws, the *keiyakukō* plays an indispensable role in the bottom-up water management of this region, which requires sophisticated, coordinated water management. Although details of how *keiyakukō*s developed in this region are unknown, they are known to have existed by the middle of the Edo period, as the Toriyagasaki Keiyakukō at Toriyagasaki district in Kami Town, the oldest *keiyakukō* known today was established in 1743.<sup>22)</sup> Today, 760 *keiyakukō*s<sup>23)</sup> exist in an area of 563 administrative units<sup>17)</sup>, functioning as locally rooted social organizations. A traditional ritual that remains in association with *keiyakukō*s is “Koizumi no Mizushugi” (Miyazaki, Kami Town), which has been designated an intangible folklore cultural asset of Miyagi Prefecture. This ritual is performed for newlyweds to grant them permission to become a member of the local *keiyakukō*. When the Great East Japan Earthquake

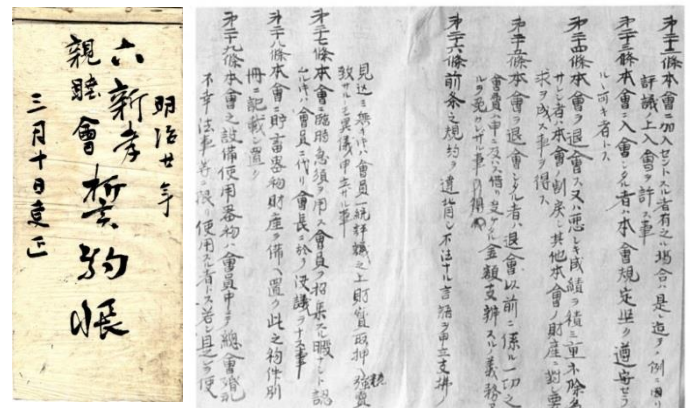


Photo 2-26 (right) Contract of a *keiyakukō* (bylaws of a *keiyakukō* of the Domyo district, Shikama Town)  
Photo 2-27 (left) *Rokushinko Seiyakucho*

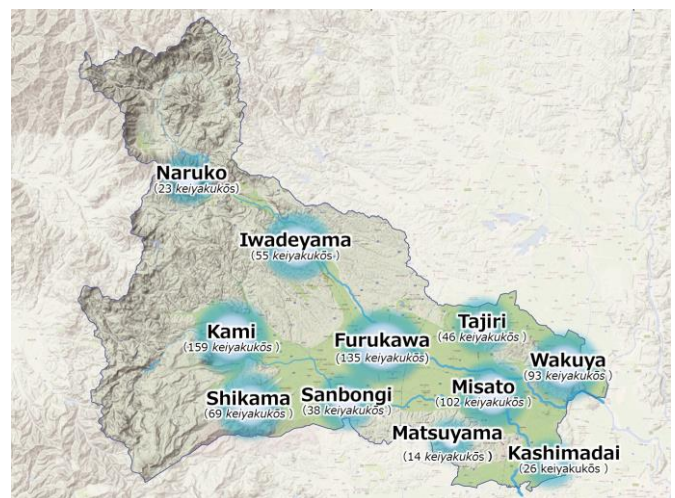


Figure2-16 network of 760 *keiyakukō*s from upstream to downstream

<sup>17)</sup> Administrative units refer to neighborhood community associations within cities and towns.

occurred, the reciprocal function of *keiyakukōs* were effective in the sharing of food and fuel, and their strong disaster response has also attracted much attention.

## b) Preserving farming culture

Local agricultural culture, including agricultural rituals, folk beliefs and folk performing arts, strongly remains in Osaki Kōdo.

### i) Agricultural rituals

Agricultural rituals are annual events that are closely related to agriculture and are performed in between every phase of agricultural production to pray for an abundant harvest. The timeline of such rituals usually takes the course of: preliminary celebration stage => averting hazards/warding off misfortunes stage => offering thanks for the harvest stage.<sup>24)25)</sup>

Examples of agricultural rituals in Osaki Kōdo are provided below. Preliminary celebration rituals include the New Year rituals of Konpoji Temple (Wakuya Town), “Yanagisawa no Yake-hachiman” (Miyazaki, Kami Town), and “Kirigome no hadaka kasedori” (Miyazaki, Kami Town). Rituals to ward off impediments such as “Mushiokuri,” which aims to ward insect pests away, and kappa (water imp) festivals, are locally performed everywhere. The “Yonekura Kashima Jinja no Kensen Gyoji” (Furukawa, Osaki City) is held to express gratitude for a harvest.



Photo 2-28 “Oyumi Shinji (divine bow ritual)” a New Year ritual at Konpoji Temple

### ii) Folk beliefs

Folk beliefs are everyday beliefs held by ordinary people that were established and fostered in a local community. An example of such folk beliefs rooted in Osaki Kōdo is the “Funagatayama Worship” that worships the deity of Funagatayama Mountain who is a god of agriculture and has a “Yamamiya (mountain shrine)” in the mountains and a “Satomiya (village shrine)” at the foot of the mountain. This type of worship that consists of “Yamamiya/Satomiya” form of worship is rarely found in Miyagi Prefecture. Other deities include the “Ujigami” that protects each household and village, as well as other agriculture-related deities, such as the “Suijin (water god)”, “Ta-no-kami (god of the rice paddies)”, “Inari-kami (god of agriculture)” and “Yama-no-kami (god of the mountains)” often enshrined in local shrines or along paths.<sup>26)</sup>



Photo 2-29 Stone representing the Funagatayama Worship

### iii) Folk performing arts

Many folk performing arts have developed in Osaki Kōdo in close association with traditional

agriculture. Some examples of folk dances that wish for an abundant harvest or a successful cereal crop are: the “Yanome Taue Matsuri (Yanome rice planting dance)” (Furukawa, Osaki City), the “Kiyomizu-chiku Taue Odori (Kiyomizu district rice planting dance)” (Shikama Town), the “Onoda Taue Odori (Onoda rice-planting dance)” (Onoda, Kami Town) designated a cultural property of Miyagi Prefecture, the “Nonodake Hakusan Honen Odori (Nonodake Hakusan dance for and abundant harvest year)” (Wakuya Town), and the “Miyabukuro Masutori Mai” (Furukawa, Osaki City)

Also, in order to pass down the long history of floods and the adaptive technologies which were developed in response to future generations, efforts are underway to preserve a traditional dam-building technique known as “monkitsuki” (Kashimadai, Osaki City). In collaboration with the local educational institution, the technique has been arranged into a folk performance which has been performed at local elementary schools. The “Taue Odori (rice planting dance)” is often performed at local festivals to pray for a successful cereal harvest.<sup>27)</sup>



Photo 2-30 Monkitsuki

### c) Food culture fostered in Osaki Kōdo

The people of Osaki Kōdo grow a large variety of agricultural products. While continuing their efforts to adapt to *yamase*, which induce cold temperature damage, and to floods, they produce the three major cereal crops of rice, wheat and soy bean as well as traditional vegetables unique to the region. The rich ingredients were used to make *kōji* (rice malt), which is used in miso and sake. The region has fostered a rich food culture and is one of the largest producers of fermented food products in Miyagi Prefecture. It should be especially noted that the region traditionally has a *mochi* (rice cake made from pounding glutinous rice)-eating culture with a diversity of ways to eat *mochi*.

#### i) *Mochi* culture

A “gochisō” (pronounced “gottsō” in the local dialect), or feast, in Osaki Kōdo would refer to a meal with *mochi*. A perusal of all locally observed annual events reveals that the number of days that *mochi* was eaten at the festive meals for festivals, celebrations and the hosting of guests (“Hare no hi”) amounted to a maximum of 67 days a year. Although “dango (sweet rice dumplings)” and glutinous rice such as “sekihan (sticky rice boiled with red beans)” were sometimes eaten instead of *mochi* in the strict sense of the word, this means that the local people ate *mochi*



Photo 2-31 “Gottsō” mochi of Osaki Kōdo

once every five days. Considering that farmers also spontaneously ate *mochi*, even on ordinary days (“Ke no hi”), for example on rainy days when field work was not possible or when they took the day off,

they may have eaten *mochi* over 70 days in a year. This region can be counted among those that consume the most *mochi* in Miyagi Prefecture. Osaki Kōdo has 46 ways to eat *mochi*, in terms of serving styles and cooking methods.<sup>28)</sup>

“Ebi-mochi (*mochi* served with shrimp)” and “Fusube-mochi (*mochi* served with loaches) are unique to this region. What rice farmers caught from fishing in the rice paddies and irrigation and drainage channels were important sources of protein and could be referred to as a byproduct of the traditional water management system.<sup>29)30)</sup>

## ii ) Food preservation techniques (fermentation and freeze-drying)

This region is home to a rich food culture based on rice and *kōji* (rice malt), as well as fermented food and preserved food using soy beans and vegetables. It was fundamental for people to prepare rice, miso and pickled foods to survive severe winters. Rice was stored in a rice granary. Miso was made by mixing boiled soy beans with salt and *kōji* (rice malt) and putting the mixture in a miso storehouse to ferment and mature slowly over a long period of time. Vegetables were fermented in a paste made from rice bran and salt.



Photo 2-32 Traditionally made miso

The local miso, known as Sendai Miso, has been made from the early modern period (1568-1867). It is said that, during the period of Toyotomi rule, each *daimyo* (local feudal lord) brought miso to the prolonged battles, but they all spoiled except for that of the Sendai Domain miso, and thus Sendai Miso gained high recognition.

Tofu and daikon radishes were freeze-dried in the cold winter wind for long storage. Even today, processed agricultural products, including miso and pickles, “shimi-dofu (freeze-dried tofu)” and “shimi-daikon (freeze-dried daikon radishes)” are handmade by the female family members of farming households and sold at local farmers’ markets, the income from which also support farmers’ household income.

## iii ) Sake brewing

The sake breweries of this region have long histories. According to some records, the Natori family of Iwadeyama, Osaki City presented the Date family with “cooking sake” before 1600 and then in 1661, the Miyamoto family of Iwadeyama was named purveyor of sake to the Iwadeyama Date household. Other sake breweries were also established in the Edo period, including the Matsumoto family of Matsuyama, Osaki City established in 1755, the Tanaka family of Nakaniida, Kami Town established in 1789, and the Sasaki family of Furukawa, Osaki City established



Photo 2-33 Traditional sake brewing

in 1790. Eleven sake breweries<sup>18</sup> currently operate in the region. In 2004, the Naruko Onsen District of Osaki City was designated a “Doburoku Special District” under the Naruko Onsenkyo Special District for Tourism and serves at farmhouses an unrefined sake called *doburoku* (made by adding *kōji* and water to steamed rice and letting the mixture ferment) made by local farmers. Another product of local partnership is a brand of sake made by a local sake brewery from local rice made using the Winter-flooding Rice Paddy method.

Furthermore, in 1997, Miyagi Prefectural Furukawa Agricultural Experiment Station developed a new variety of sake rice variety called “Kura-no-Hana” from “Yamada-Nishiki” and “Tohoku 140”. Since then, “Kura-no-Hana” has been used by many sake breweries in Miyagi Prefecture to make local brands of sake.

#### iv) Preserving the rich food culture and adding value by developing a sixth sector

Fermented food and preserved food were traditionally made using the abundant local agricultural produce in order to survive the challenging winters when the fields were covered with snow. These foods are still made and enjoyed today along with a rich food culture, including rice-based *washoku* (Japanese cuisine with rice, miso soup, one main dish, and Japanese pickles) and a traditional eating of *mochi* with varying seasonal ingredients. The local food culture continues to be appreciated today not as a means of survival but with a sense of enjoyment or out of ritual significance.



Photo 2-34 Local farmers’ market supporting the development of the sixth sector

Another important approach that supports the agricultural system of Osaki Kōdo is that the diverse agricultural product is not simply shipped as is but processed by the producers themselves to add value, with the aim to sell directly to consumers or to serve in farmhouse restaurants. In addition to such “sixth sector”<sup>19</sup> approaches that combine agricultural production as a primary industry with secondary and tertiary industries, local farmers and food processing companies have joined forces in an agriculture-commerce-industry partnership to sell new products.

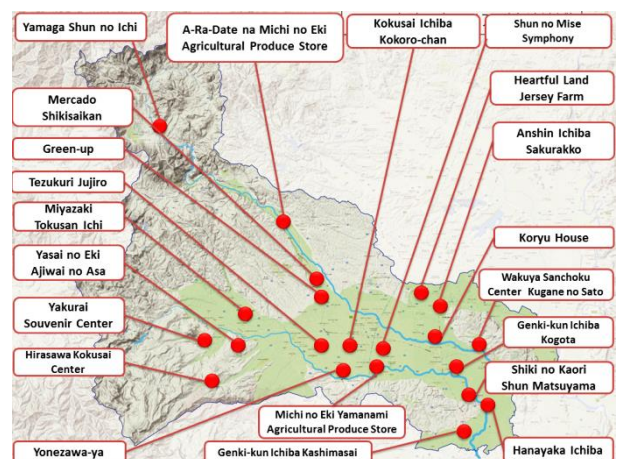


Figure2-17 Local farmers’ market

Japanese pickles and other processed food that were usually consumed at home, are currently offered to a wide range of customers, to local and visitors alike. Agricultural products, including those processed, are consumed by around 2.53 million people every year, amounting to sales of approximately

<sup>18</sup> A list of local sake breweries is provided in 2-(1)-d Table 2-3 herein.

<sup>19</sup> 909 management entities are involved in the sixth sector in the Osaki region (2015 Census of Agriculture and Forestry)

2.6 billion yen (2015 on-site survey data). A distribution and sales scheme promoting the development of the sixth sector enables farmers who support the continuity of the agricultural system to receive a share of the profits from agricultural production. This contributes to stabilizing farm management and to developing the local economy as well as preserving the agricultural system.

**【New efforts to promote the development of the sixth sector】**

- Marketing lunch boxes and opening restaurants using homegrown rice and vegetables
- Developing new products using rice flour and finding new markets for local products through farmhouse restaurants
- Producing miso and Japanese pickles using rice, soy beans and vegetables for direct sales or Internet retailing
- Producing organic and environment-friendly rice for processing and direct sales
- Manufacture and sales of snacks using rice flour
- Selling “shiso-maki” made from local *shiso* leaves, handmade miso and rice flour
- Establishing a framework under which local agricultural organizations and local companies can cooperate to foster new industries
- Developing and selling bean paste and snacks using ancient rice varieties
- Developing and selling rice *shochu* (a clear distilled liquor) made from local rice in clay vats employing the technologies used to make Kuma shochu in Hitoyoshi, Kumamoto
- Developing and selling microwavable “traditional local soups” using local ingredients and recipe kits for professional use
- Commercializing Western-style cakes that use rice flour and sake lees through collaboration between local cake shops and a local high school (with students studying to become patisserie)
- Offering homemade *doburoku* in the Naruko Onsen district under the Naruko Onsenkyo Special District for Tourism (designated in 2004)

Furthermore, approximately 200 homemade and traditional dishes made from home recipes are brought to the Food Culture Festival (Kami Town), which is held with the aim of discovering and preserving traditional food culture and to promote dietary education. Participants from both within the region and outside gather to exchange information on ingredients and cooking methods as well as share the wisdom and variety of the farmer’s kitchen, contributing to the development of a sixth sector that draws upon traditional food processing techniques.

Support for farmers engaged in the sixth sector movement is provided through partnership with the Miyagi Prefecture Sixth Sector Support Center, local governments, local agricultural cooperatives,



Photo 2-35 Food culture festival, exhibiting various processed foods



farmers' market groups, and the Liaison Group for Studies on Farming Village Life in the Osaki Region, which is researching further ways to use local ingredients.

NPO Mirai Sangyo Sozo Osaki with a membership of people engaged in local commerce, industry and agriculture also contributes to the development of a local sixth sector by making new products and finding new markets, and by providing supportive advice to match local produce with food processing techniques practiced by individual farmers and manufacturers.

Therefore, various actors are proactively involved with the development of the sixth sector from the perspectives of production, distribution, sales and communication, thus stabilizing agriculture operations and preserving and continuing the agricultural system.

#### d) Systems of communication among people

##### i) Hot spring healing culture

The toil of planting and harvesting rice under challenging natural conditions led people to celebrate the end of rice planting by making *mochi* (rice cakes) and drinking sake, and then to wash away the fatigue they spent an extended break at the hot springs in Naruko, Osaki City. This led to the development of the local *tōji* (hot spring healing) culture. The hot springs used for healing was called *tōjiba* and was also visited by farmers and fishermen from coastal villages. Hence, it functioned not only as a place for recovery but also as a place for social exchange and trade. Naruko lacquerware, lightweight wooden tableware coated in lacquer that have been designated a traditional craft<sup>20</sup> and Naruko Kokeshi wooden dolls for children were traded at the *tōjiba*, thus boosting the development of local wooden crafts.



Photo 2-36 The *tōjiba* at Naruko Onsen during the Taisho period (1912-1926)



Photo 2-37 Traditional crafts: Naruko kokeshi (left); Naruko lacquerware (right)

##### ii) Traditional markets

The markets developed for the local exchange of goods continue to be held today. Opened in 1604, the Furukawa Yaoya machi (Furukawa, Osaki) has a history of over 400 years. And the Taga Ichi is held in Kashimadai (Osaki City), Tajiri and Iwadeyama.<sup>31)</sup> Markets continue to attract many people and still function as a spot for selling traditional local vegetables and traditional crafts not available at supermarkets and other large retailers. Moreover, they are a place for communication via person-to-person sales and a forum for information exchange.

<sup>20</sup> Crafts designated by the Minister of Economy, Trade and Industry pursuant to the Act on the Promotion of Traditional Craft Industries

## (5) Landscapes and Seascapes Features

### a) “Osaki Kōdo” a landscape created by paddy agriculture

In the early Edo period, the Sendai Domain made rice paddies and channels, which would guarantee farmers food and a livelihood. Its climate features the frequent occurrence of *yamase* winds and geographically it has a gradual incline, with frequent flood and drought events. It is a unique landscape that is built upon the continuity of a traditional paddy agriculture system supported by farmers’ efforts and ingenious water management.



Photo 2-38 Mosaic land use with rice paddies, channels and *igune* homestead woodlands

Rice production under the severe environmental conditions including the frequent occurrence of *yamase* winds, flood and droughts, requires that farm work and water management be given careful attention. Therefore, farmers had little choice but to build houses on slightly elevated land scarcely found in the rice paddies, wetlands or *noyachi* (undeveloped lowland swamps) with several other households (clustered village). On the other hand, living in an open area covered with rice paddies that was originally a floodplain entailed the risk of exposure to northwesterly winds in winter as well as flood damage; and therefore, farmers have made efforts to reduce the damage by surrounding their houses with *yashikirin* (homestead woodlands) called “*igune*”. A farmer’s house surrounded by an *igune* has access to the water resources necessary for daily life through channels and “*kadoppa*” and a crop field to harvest vegetables for the family. *Igune* played an important role in enabling farmers to survive under severe natural conditions.

In general, *yashikirin* refers to homestead woodlands and are sometimes called *yashikimori* (homestead forest). Other than the *igune* of the Sendai Plain, which includes this region, well-known *yashikirin* are the “Egune” of Isawa Plain<sup>21</sup>, the “Kainyo” of Tonami Plain and the “Tsuiji-Matsu” of Izumo Plain. These are also the only regions that continue to have a wide coverage of *yashikirin* today.<sup>32)</sup>



Photo 2-39 *Igune*, a forest of biodiversity in the rice paddy

In Osaki Kōdo, around 40% (24,300 households)<sup>33)</sup> of total local households continue to have an *igune* today, thus creating a unique landscape. *Yashikirins* are divided into six categories according to the canopy trees and hedges contained. The *yashikirin* of the Osaki region belong to the categories of “*Igune*” and “*Igune-Urayama* (cluster villages, scattered houses). An “*Igune*”-type of *yashikirin* is a belt-shaped forest covering an area larger than that of a “*Kainyo*” and has the appearance of a natural forest, Cedar is the dominant

<sup>21</sup> Egune: local name for *yashikirin* in the Isawa Region of Iwate Prefecture.

species, often with a mixture of Japanese zelkova and chestnut. One of its features is that a large variation of species is found in an *igune*.<sup>34)</sup>

When the rice paddies are filled with water during rice-planting season, and the rice has yet to grow, the *igune* become a part of a unique landscape of “forests floating in the rice paddies”.

*Igune* have many functions, one of the most important being protection against strong winds. Most *igune* are found on the northwestern side of houses and low shrubs the size of hedges are often planted on the southern side. Houses are rarely completely enclosed by woodland. This implied that the *igune* were planted to protect houses from winds and snow blowing from the north or west. *Igune* were not planted to the south, presumably to let sunlight come into the house.

The Sendai Domain placed great importance on maintaining the *igune*. Lord Date Masamune ordered that as a measure against floods, farmers using the floodplains as rice paddies would only be allowed to cut down trees by permit from the domain. People were required to plant a certain number of saplings to replace the original tree, in accordance with size of the trunk of the old tree.<sup>35)</sup> He took nursery beds to 17 locations in the domain to grow saplings to be used for reforestation.<sup>36)</sup> The fact that the region had already incorporated the concept of mitigation is evidence of outstanding wisdom regarding disaster risk reduction and environmental conservation functions. Given the domain’s conservation measures, *igune* spread across a wide area within Sendai Domain. The “Arakawa-zeki Ezu” drawn in 1858 shows almost all farm residences with an *igune*. Even in modern times, without domain-led conservation measures, *igune* remain in the local landscape because they have continued to be conserved by people who understand their importance.



Photo 2-40 Arakawa-zeki Ezu (portion)  
1858 drawn based on measurement

Although *igune* are planted forests, they are home to numerous species of trees and thus to diverse and complex ecosystems. Major tree species are cedar, bamboos, *Neolitsea sericea*, hinoki cypresses, camellia, Japanese spindle, black pine, Japanese persimmon and Japanese alder. The complexity and diversity has supported local lives. Lower branches and fallen leaves become fuel and compost, thick branches and tree thinnings are used for wooden crafts and as fuel, and fruit and nuts and plant shoots provide food. Trees like camellia and Japanese nutmeg provide seeds from which oil can be extracted. Also, trees like the Amur cork tree and plants like Thunberg’s geranium have been valued as medication for the stomach. Fully grown trees can be used as building material. Also, a “kadoppa,” or a place for washing, is made in the channels around a *igune* small fish, such as loaches, and small shrimps from the channels are valuable sources of nutrition that are enjoyed with *mochi* as traditional food.

Osaki Kōdo’s landscape represents mosaic land use, including a water network embracing rice paddies, *igune* scattered



Photo 2-41 Rice paddies close to an  
*igune*, full of birds

in the landscape like forests floating in the rice paddies, channels carrying water over a total of 6,000 km, and 1152 reservoirs. It is a unique landscape that fosters farmers' livelihoods and lives as well as a rich ecosystem with biodiversity-supporting functions.

**b) Value of the landscape from the perspective of agricultural biodiversity**

The channels, reservoirs, rice paddies, and *igune* that have become a part of the local landscape as a result of the traditional water management system form a network of space, land and water that contributes to the conservation of the valuable biodiversity that fosters natural enemies and enhances the beauty of the landscape when in use. In addition, an *igune* is composed of Japanese alders, which can grow in wetlands, cedar, and other various tree species, including subcanopy trees and understory trees. Birds, frogs, snakes, and dragonflies travel between the rice paddies and *igune*, which are scattered in the unique landscape like “forests floating in the water,” a creation of the agriculture of Osaki Kōdo and contributing to maintaining the diversity of the wetland ecosystem.

Various tree and plant species including medical herbs that people have chosen to grow, subcanopy trees that bear edible fruits and nuts and understory trees can be found in a local *igune*. (A total of 207 tree species, or 502 species of vegetation, including plant species, have been collectively found in 12 *igune* covering a total area of 1,300m<sup>2</sup>-3,900m<sup>2</sup> <sup>22</sup>) Compared with homestead woodlands in other regions – the “Tsuiji-Matsu” composed mainly of black pines on the Izumo Plain in Shimane Prefecture and the “Kainyo” on the Tonami Plain in Toyama Prefecture with 142 tree species<sup>37</sup> – Osaki Kōdo is home to greater biodiversity.

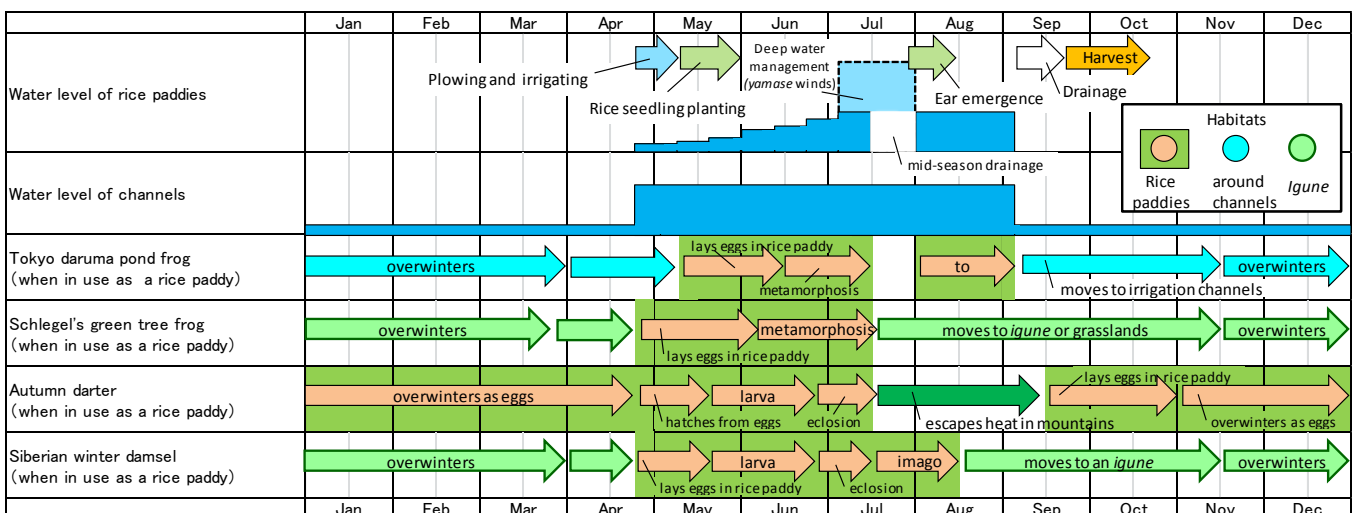


Figure 2-18 Environment provided for organisms by rice paddies, channels and *igune*

<sup>22</sup> 2017 survey on the vegetation of *igune* in Osaki City.

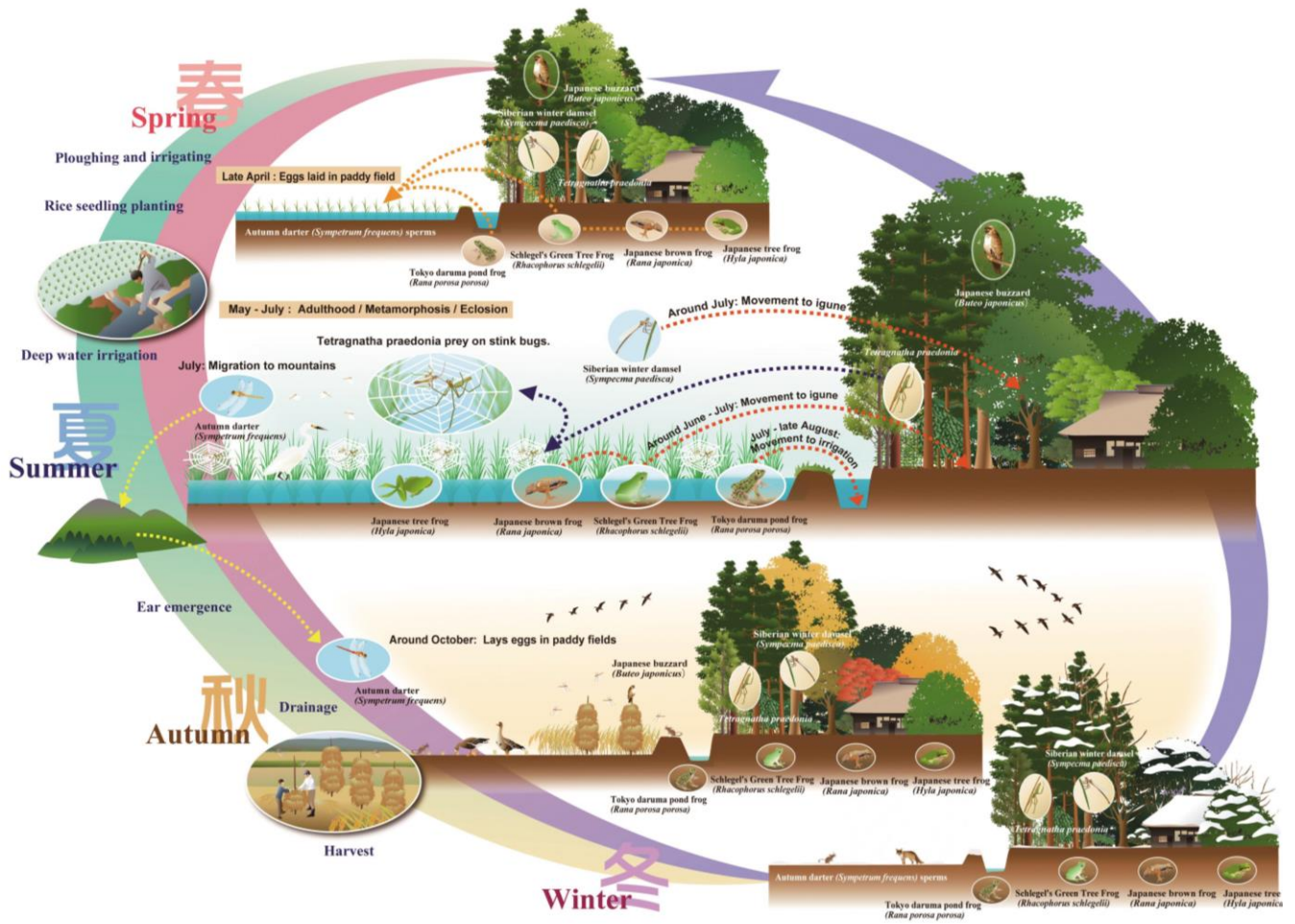
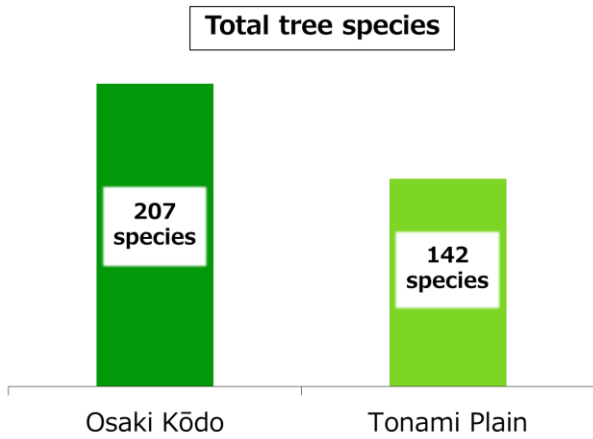


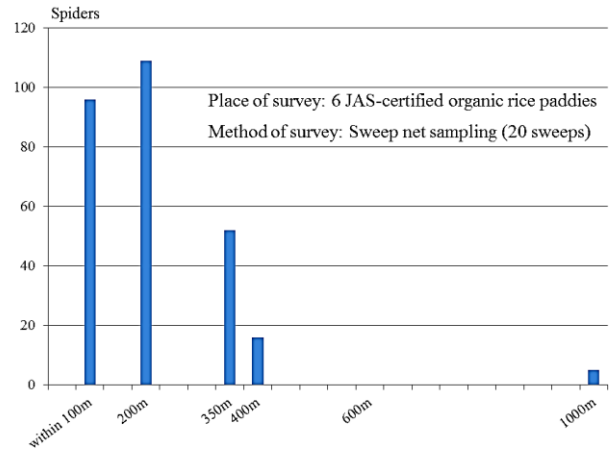
Figure 2-19 Relationship among rice paddies, channels and *igune* homestead woodlands from a biodiversity perspective

The diversity of plant and tree species provide an environment suitable for birds of prey, such as the buteo, as well as foxes and other top predators that prey on Japanese grass vole, Japanese white-toothed shrew, and others small mammals that cause water leaks in the ridges between rice paddies. Seed dispersing brown-eared bulbul and dusky thrush, which have also been observed, contribute to enhancing the diversity of the vegetation in *igune*.

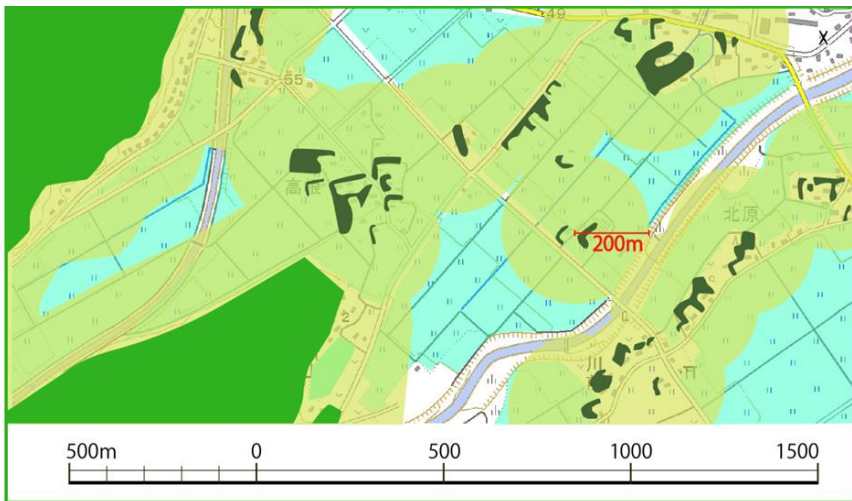
*Igune* provide the medicinal plants and fruit and nuts required to live, and offer frogs, dragonflies and spiders, the indigenous natural enemies of rice paddy pests, a habitat during winter and in high temperatures during summer; and enable them to travel to and from rice paddies. Planed forests, *igune*, create a symbiotic relationship between paddy agriculture and living creatures, thus maintaining rich agricultural biodiversity.



Graph 2-5 Comparison of plant and tree species found in the Osaki Region's *igune* and homestead woodlands in other regions<sup>22,37)</sup>



Graph 2-6 Number of *Tetragnatha* spiders caught by distance from *igune* (compiled based on Osaki City Report on the Study on Participatory Monitoring Methods<sup>9)</sup>)



Legend	Color
Rice Paddy	
Igune	
Forest	
Rice paddies with long-jawed orb-weavers	

Figure 2-20 Ecological network resulting from having *igune* in a paddy agriculture region

### c) Various values provided by the landscape

The landscape of Osaki Kōdo has been preserved by active conservation led by farmers and *keiyakukō* have played a central role in this. They have strengthened their group ties through work and pleasure, having all members participate in the regular maintenance and repairs of channels and reservoirs, eating *mochi* between tasks, going out together for hot spring healing, catching fish by swamp dredging and holding festivals to pray for a successful harvest.



Photo 2-42 Exchange with consumers supporting agriculture



Photo 2-43 Conservation activities in irrigation channels

Such active conservation activities

had become scarce due to changes in the social and economic structure of agricultural villages, including the modernization of agriculture and a declining agricultural population.

However, the participation of non-farmers, companies, NPOs, educational institutions



Photo 2-44 Swamp dredging with the full participation of local residents



Photo 2-45 Tree-planting event in water source forests for city residents

and various other actors who understand the historical background of the local agricultural system and its value has added new value to conservation activities. For example, walking rallies and exchange between cities and agricultural villages add recreational value, biological field surveys with elementary school students add educational value and the revival of swamp dredging activities will contribute to the conservation of habitats of indigenous species.

- i ) Tours to conserve historical irrigation channels that support traditional water management
- ii ) Agricultural experiences and biological field surveys based on producer-consumer communication
- iii ) ESD<sup>23</sup> program teaching the value of local agriculture from a wetland biodiversity perspective
- iv ) Green tourism and eco-tourism to attract city residents



Figure 2-21 Image of the landscape of Osaki Kōdo

<sup>23</sup> ESD: Education for Sustainable Development. Education and educational activities that aim to create a sustainable society by addressing the challenges of modern society as one's own and beginning by addressing issues close at hand to generate new values and actions that will lead to the resolution of such challenges. ESD has been implemented in this region since June 2005.

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## Attachments

### 1. District Map (Details) and Land-use Map

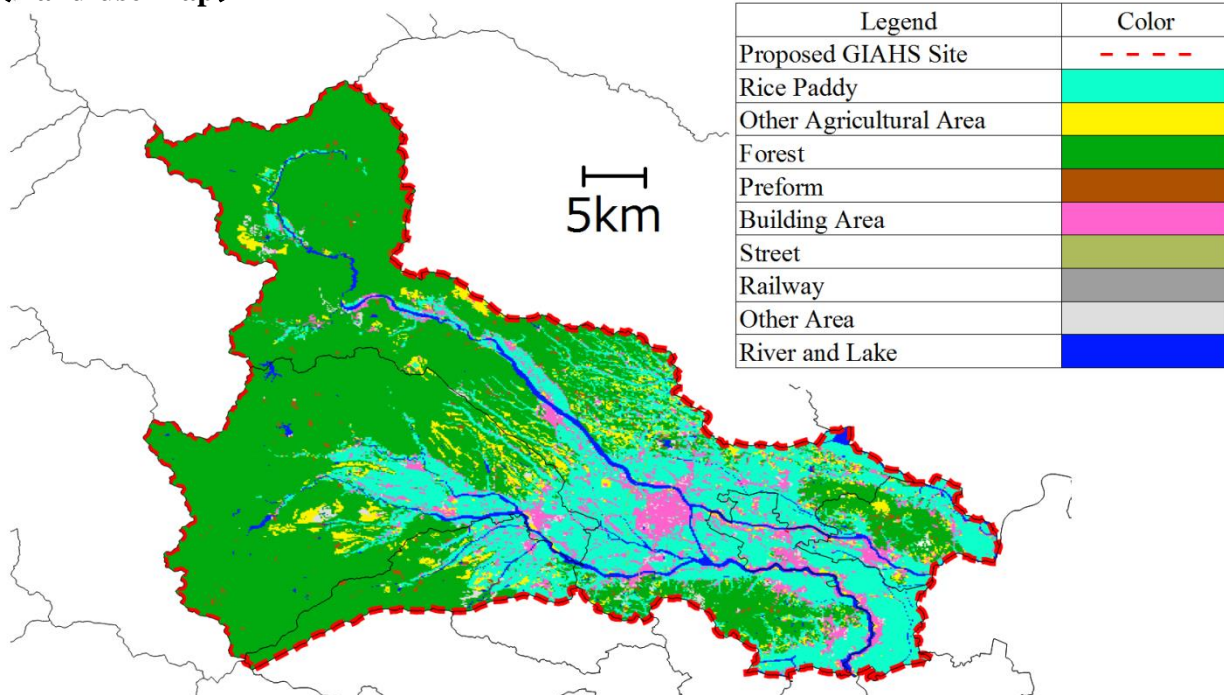
#### < DistrictMap (Detail) >

The geographical coordinates are:

North latitude 38°26'18"~38°55'25" and east longitude 140°42'2"~141°7'43"



#### < Land-use Map >



## 2. Biodiversity List

### Overview of biodiversity list

#### Plants



*Pourthiaea villosa* (Thunb.)  
Decne. : Formerly used as the material for sickle handles and nose rings for cows. The red berries are a popular food for small birds.



*Ixeris japonica* (Burm.f.)  
Nakai : Preserved by the cutting of weeds on the levees between the rice paddies it helps to prevent the levees from collapsing.

1,844 species from 163 genera have been identified; of these, 174 species are included in the Red Lists of the Ministry of the Environment and of Miyagi Prefecture.

The diversity of wetland plants handed down by a landscape made up of rice paddies, small woods, water channels, and reservoirs, as well as the small woods known as “*igune*” which surround farmhouses and can be justifiably called nearby community woodlands, enrich the biodiversity of this area. In particular, the *igune* woods possess a high degree of biodiversity: trees and plants from 85 genera and 271 species, including cedars and cypresses, bamboos and bamboo grasses, Amur cork trees, and alders have been identified as making up these woods. In addition to the trees planted by humans, plants which grow from seeds brought by air in the droppings of small birds increase the biodiversity. Moreover, farmers choose from among these plants which can be used as the material for agricultural tools, have medicinal properties, or can be eaten, leaving them in place (or planting them); this gives rise to a distinctive diversity. Furthermore, this vegetation not only prevents strong winds and floods, but also functions as a place of refuge during the season when there is no water in the rice paddies, to escape from the heat, and to pass the winter for Japanese brown frogs (*Rana japonica*), Schlegel’s green tree frogs (*Rhacophorus schlegelii*), Japanese tree frogs (*Hyla japonica*), Siberian winter damselflies (*Sympecma paedisca*), types of red dragonfly (*Sympetrum*), and so on. In this way, it also plays the role of a habitat for the living creatures which eat the insects that harm the rice crop.

## Insects and spiders



*Sympetrum frequens* : Rice paddies are its principal breeding ground.



*Tetragnatha* spider : A species of spider which builds webs. It spins horizontal webs, preying on pests and other insects.

3648 species of insects from 251 genera and 16 species of rice paddy vicinity spiders from 6 genera have been identified. Of these, 62 species are included in the Red Lists of the Ministry of the Environment and of Miyagi Prefecture. Biodiversity spanning everything from species commonly found in the areas surrounding habitation to rare species has been maintained: species found here include types of red dragonfly (*Sympetrum*), which breed mainly in rice paddies, and giant water bugs and diving beetles, which live and breed in rice paddies.

For insects such as Siberian winter damselflies and summer darters (*Sympetrum darwinianum*), the *igune* woods play an important role as a place to spend the winter or escape from the heat, while reservoirs and water channels provide a refuge when there is no water in the rice paddies. This diversity of insects and spiders plays the role of supplying native natural enemies to spotted paddy rice stinkbugs and other pests which harm the rice crop. In particular, it has been learned that the presence of both *Tetragnatha* spiders, which build webs, and wolf spiders (*Lycosidae*), which prowl, suppress the proliferation of harmful insects even further, putting them in a symbiotic relationship with agriculture.

## Fish, shellfish, and crustaceans



*Pseudorasbora pumila pumila*: A rare species whose Japanese name comes from the Osaki area.



*Oryzias latipes*: It comes and goes between the water channels and rice paddies breeding in the rice paddies.

60 species of fish from 16 genera, 23 species of shellfish from 13 genera, and 8 species of crustaceans from 6 genera have been identified. Of these, 29 species are included in the Red Lists of the Ministry of the Environment and of Miyagi Prefecture. Fish which breed in the rice paddies and spend the winters in the gently flowing water channels or the earth of the rice paddies, such as loaches (*Misgurnus anguillicaudatus*) and Japanese rice fish (*Oryzias latipes*), inhabit a wide area. Since the rivers, water channels, and rice paddies are connected, many varieties of fish live here. By proper management of the reservoirs through means such as dredging, species of fish representative of this area, such as a type of topmouth gudgeon (*Pseudorasbora pumila pumila*) and Netted bitterling (*Acheilognathus typus*), which are native to eastern Japan but have declined in recent years due to the impact of nonnative fish, are being conserved. Dredging also provides a favorable

habitat for bivalves of the freshwater mussel genus (*Unionidae*), and the conservation of freshwater mussels leads to an improved habitat for small-scale bitterlings, which spawn in bivalves. In addition, rice paddy fishing for loaches, freshwater shrimps (*Paratya improvisa*), and others is still carried out in the water channels today.

### Reptiles and amphibians



*Pelophylax porosus* : It comes and goes between the water channels and rice paddies

13 species of reptiles from 9 genera and 15 species of amphibians from 6 genera have been identified. Of these, 10 species are included in the Red Lists of the Ministry of the Environment and of Miyagi Prefecture. Since this area has a landscape of small *igune* woods, reservoirs, and water channels in the vicinity of the rice paddies, species of frog which have a small range of suitable habitat, such as Schlegel's green tree frogs and Japanese brown frogs, can inhabit a wide area even in the flatlands by coming and going between the rice paddies and the surrounding environment. Moreover, proper management of the water channels leads to the conservation of species which are highly dependent on the waterside, such as the Tokyo Daruma pond frog (*Rana porosa porosa*). These species of frog are natural enemies in the rice paddies; in particular, the Japanese tree frog climbs to the tip of the rice stalks to prey on harmful insects and other small animals.

### Birds and mammals



*Ardea alba* : It preys on creatures such as loaches, red swamp crayfish, and frogs in the rice paddies.



*Anser albifrons* and swans: They rest in the winter-flooded rice paddies.

271 species of birds from 46 genera and 36 species of mammals from 13 genera have been identified. Of these, 70 species are included in the Red Lists of the Ministry of the Environment and of Miyagi Prefecture. Golden eagles (*Aquila chrysaetos japonica*) and Japanese serows (*Capricornis crispus*) inhabit catchment areas, while representative species at the top of community woodland ecosystems, such as Japanese Red foxes (*Vulpes vulpes japonica*) and goshawks (*Accipiter gentilis*), inhabit the area due to the existence of *igune*, secondary woodland close to habitation. Moreover, there are many waterside birds, such as ducks, geese, swans, and herons, which live in rice paddies and wetlands, and the fact that these make up 43% of total bird species is distinctive.



# (1) Plants

EX: Extinct EW: Extinct in the Wild CR: Critically Endangered EN: Endangered VU: Vulnerable NT: Near Threatened DD: Data Deficient LP: Local Population

No.	class	family	species		category in Red List in Japan	
			Japanese name	scientific name	National (MOE)	Local (Miyagi pref.)
1	Charophyceae	Characeae	シャジクモ	<i>Chara braunii</i> Gmelin	VU	
2	Marchantiopsida	Ricciaceae	イチヨウウキゴケ	<i>Ricciocarpos natans</i> (L.) Corda	NT	CR+EN
3	Lycopodiopsida	Lycopodiaceae	スギラン	<i>Lycopodium cryptomerinum</i>	VU	CR+EN
4	Isoetopsida	Selaginellaceae	クラマゴケ	<i>Selaginella remotifolia</i> Spring		
5		Isoetaceae	ミズニラ	<i>Isoetes japonica</i> A. Braun	NT	NT
6			ミズニラモドキ	<i>Isoetes pseudojaponica</i> M.Takamiya, Mitsu.Watan. et K.Ono	VU	CR+EN
7	Equisetopsida	Equisetaceae	スギナ(ミチサナ)	<i>Equisetum arvense</i> L.		
8	Equisetopsida	Equisetaceae	トクサ	<i>Equisetum hyemale</i>		
9	Psilotopsida	Ophioglossaceae	ヤマハナワラビ	<i>Botrychium multifidum</i> (S.G.Gmel.) Rupr. var. <i>multifidum</i>		VU
10	Pteridopsida	Adiantaceae	クジャクシダ	<i>Adiantum pedatum</i> L.		
11	Pteridopsida	Dryopteridaceae	リョウメンシダ	<i>Arachniodes standishii</i> (T.Moore) Ohwi		
12	Pteridopsida	Dryopteridaceae	ベニシダ	<i>Dryopteris erythrosora</i> (D.C.Eaton) KuNTze		
13			タニゴ	<i>Dryopteris tokyoensis</i> (Makino) C.Ch.		
14			ホソバナライシダ	<i>Leptorumhra miqueliana</i> (Maxim. Ex Franch. Et Sav.) H.Ito		
15			オクヤマシダ	<i>Dryopteris amurensis</i>		VU
16			キノクニベニシダ	<i>Dryopteris kinokuniensis</i> Sa.Kurata		VU
17			Thelypteridaceae	ハシゴシダ	<i>Thelypteris glanduligera</i>	
18		Woodsiaceae	イヌワラビ	<i>Athyrium niponicum</i> (Mett.) Hance		
19			オクヤマワラビ	<i>Athyrium distentifolium</i>		CR+EN
20			ホソバイヌワラビ	<i>Athyrium iseanum</i>		NT
21			コウヤワラビ	<i>Onoclea sensibilis</i> L. var. <i>interrupta</i> Maxim		
22	ウスヒメワラビ		<i>Acystopteris japonica</i> (Luerss.) Nakai		CR+EN	
23	Polypodiaceae	イワオモダカ	<i>Pyrrosia hastata</i> (Houtt.) Ching		VU	
24	Marsileaceae	デンジソウ	<i>Marsilea quadrifolia</i> L.	VU	EW	
25	Salviniaceae	サンショウウモ	<i>Salvinia natans</i> (L.) All.	VU	NT	
26	Pinopsida	Cupressaceae	ヒノキ	<i>Chamaecyparis obtusa</i> (Siebold. et Zucc.) Endl.		
27			サワラ	<i>Chamaecyparis pisifera</i>		
28		Pinaceae	モミ	<i>Abies firma</i> Siebold et Zucc.		
29			アカマツ	<i>Pinus densiflora</i> Siebold et Zucc.		
30			クロマツ	<i>Pinus thunbergii</i>		
31	Taxodiaceae	スギ	<i>Cryptomeria japonica</i> (L.f.) D. Don			
32		イチイ	<i>Taxus cuspidata</i>			
33		イヌガヤ	<i>Cephalotaxus harringtonia</i>			
34		Magnoliopsida	Juglandaceae	オニグルミ	<i>Juglans mandshurica</i> Maxim. var. <i>sachalinensis</i> (Komatsu) Kitam.	
35		Salicaceae	ネコヤナギ(ヒコヤナギ)	<i>Salix gracilistyla</i> Miq.		
36		Salicaceae	オオバヤナギ	<i>Salix cardiophylla</i> Trautv. et C.A.Mey. var. <i>urbaniana</i> (Seemen) Kudô		NT
37		ユビソヤナギ	<i>Salix hukaoana</i> Kimura	VU	VU	
38		Betulaceae	ハンノキ	<i>Alnus japonica</i> (Thunb.) Steud.		
39			アカシデ	<i>Carpinus laxiflora</i> (Siebold et Zucc.) Blume		
40			ミズメ	<i>Betula grossa</i> Siebold et Zucc.		
41			ウダイカンバ	<i>Betula maximowicziana</i>		
42			アサダ	<i>Ostrya japonica</i>		
43		Fagaceae	クリ	<i>Castanea crenata</i> Siebold et Zucc.		
44			クヌギ	<i>Quercus acutissima</i> Carruth.		
45	コナラ		<i>Quercus serrata</i> Murray			
46	ブナ		<i>Fagus crenata</i> Blume			
47	ナラガシワ		<i>Quercus aliena</i> Blume			
48	ミズナラ		<i>Quercus crispula</i> Blume var. <i>crispula</i>			
49	Ulmaceae	ケヤキ	<i>Zelkova serrata</i> (Thunb.) Makino			
50		エノキ	<i>Celtis sinensis</i> var. <i>japonica</i>			
51	Moraceae	カナムグラ	<i>Humulus scandens</i> (Lour.) Merr.			
52		ヤマグワ	<i>Morus australis</i> Poir.			
53		ヒメコウゾ	<i>Broussonetia kazinoki</i>			
54	Urticaceae	ムカゴイラクサ	<i>Laportea bulbifera</i>			
55		ミヤマイラクサ	<i>Laportea cuspidata</i> (Wedd.) Friis			
56		アオミズ	<i>Pilea pumila</i> (L.) A.Gray			
57	Polygonaceae	ミズヒキ	<i>Persicaria filiformis</i> (Thunb.) Nakai ex W.T.Lee			
58		サクラタデ	<i>Persicaria macrotha</i> (Meisn.) Haraldson subsp. <i>conspicua</i> (Nakai) Yonek.			
59		スイバ	<i>Rumex acetosa</i> L.			
60		ギンギシ	<i>Rumex japonicus</i> Houtt.			
61		エゾノギンギシ	<i>Rumex obtusifolius</i> L.			
62		オオツルイタドリ	<i>Fallopia deTatoalata</i> (F.Schmidt) Holub			
63		ヤナギヌカボ	<i>Persicaria foliosa</i> var. <i>paludicola</i>	VU	Species requiring attention	
64		ナガバノウナギツカミ	<i>Persicaria hastatosagittata</i> (Makino) Nakai	NT	VU	
65		イヌタデ	<i>Persicaria longiseta</i>			
66		ヌカボタデ	<i>Persicaria taquetii</i> (H.Lév.) Koidz.	VU	Species requiring attention	
67	ホソバイヌタデ	<i>Persicaria trigonocarpa</i>	NT	NT		
68	ノダイオウ	<i>Rumex longifolius</i> DC.	VU	Species requiring attention		
69	Phytolaccaceae	ヤマゴボウ	<i>Phytolacca acinosa</i> Roxb.			

No.	class	family	species		category in Red List in Japan		
			Japanese name	scientific name	National (MOE)	Local (Miyagi pref.)	
70			ヨウシュヤマゴボウ	<i>Phytolacca americana</i> L.			
71		Portulacaceae	スベリヒユ	<i>Portulaca oleracea</i> L.			
72		Caryophyllaceae	ミミナグサ	<i>Cerastium glomeratum</i> Baumg. Subsp. Vulgare (Hartm.) Greuter et Burdet var. angustifolium (Franch.) H.Hara			
73			オランダミミナグサ	<i>Cerastium glomeratum</i> Thuill.			
74			カワラナデシコ	<i>Dianthus superbus</i> L. var. longicalycinus (Maxim.) F.N.Williams			
75			ツメクサ	<i>Sagina japonica</i> (Sw.) Ohwi			
76			ノミノフスマ	<i>Stellaria uliginosa</i> Murray var. <i>undulata</i> (Thunb.) Fenzl			
77			イトハコベ	<i>Stellaria filicalis</i> Makino	VU	CR+EN	
78		Chenopodiaceae	アカザ	<i>Chenopodium album</i> L. var. <i>ceNTrorubrum</i> Makino			
79		Amaranthaceae Juss.	イノコズチ	<i>AchyraNTes bideNTata</i> Blume var. <i>japonica</i> Miq.			
80			イヌビユ	<i>AmaranThus blitum</i> L.			
81		Magnoliaceae	コブシ(キコブシ)	<i>Magnolia kobus</i> DC.			
82		Magnoliaceae	ホオノキ	<i>Magnolia obovata</i> Thunb.			
83		Lauraceae	オオバクロモジ	<i>Lindera umbellata</i> Thunb. Var. <i>membranacea</i> (Maxim.) Momiy. ex H.Hara et M.Mizush.			
84			シロダモ	<i>Neolitsea sericea</i>			
85		Ranunculaceae	カザグルマ	<i>Clematis patens</i> C.Morr. et Decne.	NT	VU	
86			セリバオウレン	<i>Coptis japonica</i> (Thunb.) Makino var. <i>major</i> (Miq.) Satake			
87			オキナグサ	<i>Pulsatilla cernua</i> (Thunb.) Bercht et C.Presl	VU	CR+EN	
88			バイカモ	<i>Ranunculus nipponicus</i> var. <i>major</i>	EN		
89			ニリンソウ	<i>Anemone flaccida</i> F.Schmidt			
90			スハマソウ	<i>Anemone hepatica</i> var. <i>japonica</i> f. <i>variegata</i>		NT	
91			コキツネノボタン	<i>Ranunculus chinensis</i>	VU	VU	
92				シラネアオイ	<i>Glaucidium palmatum</i>		
93		Berberidaceae	キバナイカリソウ	<i>Epimedium koreanum</i> Nakai			
94		Lardizabalaceae	アケビ	<i>Akebia quinata</i> (Houtt.) Decne.			
95			ミツバアケビ	<i>Akebia trifoliata</i> (Thunb.) Koidz.			
96		Menispermaceae	アオツツラフジ	<i>Cocculus orbiculatus</i>			
97			ツツラフジ	<i>Sinomenium acutum</i>		DD	
98		Saururaceae	ドクダミ	<i>Houttuynia cordata</i> Thunb.			
99			ハンゲショウ	<i>Saururus chinensis</i>		VU	
100		Chloranthaceae	ヒトリシズカ	<i>ChloranThus japonicus</i>			
101		Theaceae	ヤブツバキ	<i>Camellia japonica</i> L.			
102		Hypericaceae	オトギリソウ	<i>Hypericum erectum</i> Thunb.			
103		Droseraceae	モウセンゴケ	<i>Drosera rotundifolia</i> L.		VU	
104		Papaveraceae	クサノオウ	<i>Chelidonium majus</i> L. subsp. <i>asiaticum</i> H.Hara			
105			ムラサキケマン	<i>Corydalis incisa</i> (Thunb.) Pers.			
106			イヌエンジュ	<i>Maackia amurensis</i> var. <i>buergeri</i>			
107			ミヤマキケマン	<i>Corydalis pallida</i> var. <i>tenuis</i>			
108			オサバグサ	<i>Pteridophyllum racemosum</i>		CR+EN	
109			Brassicaceae	ワサビ	<i>Eutrema japonicum</i> (Miq.) Koidz.		
110		イヌガラシ		<i>Rorippa indica</i> (L.) Hiern			
111		ミズタガラシ		<i>Cardamine lyrata</i> Bunge		VU	
112		ミヤママンネングサ		<i>Sedum japonicum</i> var. <i>senanense</i>		VU	
113		Crassulaceae	キリンソウ	<i>Sedum aizoon</i> var. <i>floribundum</i>			
114			ベンケイソウ	<i>Hylotelephium erythrostictum</i>		VU	
115		Saxifragaceae	チダケサシ	<i>Astilbe microphylla</i> Knoll			
116			ウツギ	<i>Deutzia crenata</i> Siebold. et Zucc. var. <i>crenata</i>			
117			ノリウツギ	<i>Hydrangea paniculata</i> Siebold			
118			タコノアシ	<i>PeNThorum chinense</i>	NT		
119			ダイヤモンドソウ	<i>Saxifraga fortunei</i> var. <i>incislobata</i>			
120			ユキノシタ	<i>Saxifraga stolonifera</i> Curtis			
121			エゾノチャルメルソウ	<i>Mitella iNTegripetala</i>		CR+EN	
122			ヤシヤビシヤク	<i>Ribes ambiguum</i>	NT	VU	
123			Rosaceae	キンミズヒキ	<i>Agrimonia pilosa</i> Ledeb. var. <i>japonica</i> (Miq.) Nakaki		
124				ヤマブキシヨウマ	<i>Aruncus dioicus</i> (Walter) Fernald var. <i>kamtschaticus</i> (Maxim.) H.Hara		
125		カスミザクラ		<i>Cerasus leveilleana</i> (Koehne) H.Ohba			
126		ヤマブキ		<i>Kerria japonica</i> (L.) DC.			
127		ウワミズザクラ		<i>Padus grayana</i> (Maxim.) C.K.Schneid.			
128		ヒメヘビイチゴ		<i>PoteNTilla ceNTigrana</i> Maxim.			
129		ミツバツチグリ		<i>PoteNTilla freyniana</i> Bornm.			
130		キンロバイ		<i>PoteNTilla fruticosa</i> var. <i>rigida</i>	VU	CR+EN	
131		ヘビイチゴ		<i>PoteNTilla hebiichigo</i> Yonek. et H.Ohashi			
132		ヒロハノカワラサイコ		<i>PoteNTilla nipponica</i> Th. Wolf	VU	NT	
133		カマツカ (ワタゲカマツカ、ケカマツカ)		<i>Pourthiaea villosa</i> (Thunb.) Decne.			
134		ノイバラ		<i>Rosa multiflora</i> Thunb.			
135		ナガボノシロワレモコウ		<i>Sanguisorba tenuifolia</i> var. <i>alba</i>		VU	
136		ユキヤナギ		<i>Spiraea thunbergii</i> Siebold ex Blume			
137		クサボケ	<i>Chaenomeles japonica</i>		CR+EN		
138		チョウジザクラ	<i>Prunus apetala</i>				
139			イヌザクラ	<i>Prunus buergeriana</i>			
140		Fabaceae	ネムノキ	<i>Albizia julibrissin</i> Durazz.			
141			ミヤギノハギ	<i>Lespedeza thunbergii</i>			
142			イヌハギ	<i>Lespedeza tomeNTosa</i>	VU	NT	
143			マキエハギ	<i>Lespedeza virgata</i>		NT	

No.	class	family	species		category in Red List in Japan	
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144			ミヤコグサ	<i>Lotus corniculatus</i> L. var. <i>japonicus</i> Regel		
145			コメツブツメクサ	<i>Trifolium dubium</i> Sibth.		
146			シロツメクサ	<i>Trifolium repens</i> L.		
147			トキリマメ	<i>Rhynchosia acuminatifolia</i>		NT
148			タヌキマメ	<i>Crotalaria sessiliflora</i>		CR+EN
149		Oxalidaceae	カタバミ	<i>Oxalis corniculata</i> L. var. <i>corniculata</i>		
150		Geraniaceae	タカネゲンナイフウロ	<i>Geranium eriostemon</i> var. <i>reinii</i> f. <i>onoei</i>		CR+EN
151		Euphorbiaceae	エノキグサ	<i>Acalypha australis</i> L.		
152			ノウルシ	<i>Euphorbia adenochlora</i> C.Morren et Decne.	NT	Species requiring attention
153		Rutaceae	サンショウ	<i>Zanthoxylum piperitum</i> (L.) DC. (1824)		
154			キハダ	<i>Phellodendron amurense</i>		
155		Polygalaceae	ナルコユリ	<i>Polygonatum falcatum</i>		DD
156		Anacardiaceae	ヌルデ	<i>Rhus javanica</i> L. var. <i>chinensis</i> (Mill.) T.Yamaz.		
157			ツタウルシ	<i>Toxicodendron orientale</i> Greene		
158			ヤマウルシ	<i>Toxicodendron trichocarpum</i> (Miq.) KuNTze		
159		Aceraceae	ヤマモミジ	<i>Acer amoenum</i> Carrière var. <i>matsumurae</i> (Koidz.) K.Ogata		
160			イロハモミジ	<i>Acer palmatum</i>		
161			エンコウカエデ	<i>Acer pictum</i> Thunb. subsp. <i>dissectum</i> (Wesm.) H.Ohashi f. <i>dissectum</i> (Wesm.) H. Ohashi		
162			コハウチワカエデ	<i>Acer sieboldianum</i>		
163			オオモミジ	<i>Acer palmatum</i> var. <i>amoenum</i>		
164		Hippocastanaceae	トチノキ	<i>Aesculus turbinata</i> Blume		
165		Aquifoliaceae	イヌツゲ	<i>Ilex crenata</i> Thunb. var. <i>crenata</i>		
166			ウメモドキ	<i>Ilex serrata</i> Thunb.		
167		Celastraceae	ツルウメモドキ	<i>Celastrus orbiculatus</i> Thunb. var. <i>orbiculatus</i>		
168			ニシキギ	<i>Euonymus alatus</i> (Thunb.) Siebold var. <i>alatus</i>		
169			ツルマサキ	<i>Euonymus fortunei</i> (Turcz.) Hand.-Mazz.		
170			マサキ	<i>Euonymus japonicus</i>		
171			マユミ	<i>Euonymus sieboldianus</i> Blume var. <i>sieboldianus</i>		
172		Rhamnaceae	ホナガクマヤナギ	<i>Berchemia longeracemosa</i>		VU
173		Vitaceae	ノブドウ	<i>Ampelopsis glandulosa</i> (Wall.) Momiya var. <i>heterophylla</i> (Thunb.) Momiya		
174			ヤマブドウ	<i>Vitis coignetiae</i> Pulliat ex Planch.		
175			ヤマシャクヤク	<i>Paeonia japonica</i>	NT	CR+EN
176			ベニバナヤマシャクヤク	<i>Paeonia obovata</i>	VU	VU
177		Violaceae	タチツボスミレ	<i>Viola grypoceras</i>		
178			スミレ	<i>Viola mandshurica</i> W.Becker var. <i>mandshurica</i>		
179			フモトスミレ	<i>Viola pumilio</i>		VU
180			エゾノタチツボスミレ	<i>Viola acuminata</i>		NT
181			オオタチツボスミレ	<i>Viola kusanoana</i> Makino		
182		Cucurbitaceae	アマチャヅル	<i>Gynostemma pentaphyllum</i> (Thunb.) Makino		
183			キカラウリ	<i>Trichosanthes kirilowii</i> Maxim. var. <i>japonica</i> (Miq.) Kitam.		
184			スズメウリ	<i>Zehneria japonica</i> (Thunb.) H.Y.Liu		
185		Lythraceae	ミソハギ	<i>Lythrum anceps</i> (Koehne) Makino		
186		Trapaceae	ヒメビシ	<i>Trapa incisa</i> Siebold et Zucc.	VU	CR+EN
187		Haloragaceae	タチモ	<i>Myriophyllum ussuriense</i> (Regel) Maxim.	NT	VU
188			オグラノフサモ	<i>Myriophyllum oguraense</i> Miki	VU	VU
189		Cornaceae	アオキ	<i>Aucuba japonica</i> Thunb. var. <i>japonica</i>		
190			ミズキ	<i>Cornus controversa</i> Hemsl. ex Prain var. <i>controversa</i>		
191			ヤマボウシ	<i>Cornus kousa</i> Buerger ex Hance		
192		Araliaceae	ウド	<i>Aralia cordata</i> Thunb.		
193			タラノキ	<i>Aralia elata</i> (Miq.) Seem.		
194			カクレミノ	<i>Dendropanax trifidus</i> (Thunb.) Makino ex H.Hara		
195			ヤマウコギ	<i>Eleutherococcus spinosus</i> (L.f.) S.Y.Hu var. <i>spinosus</i>		
196			キヅタ	<i>Hedera rhombea</i> (Miq.) Bean		
197		Apiaceae	セントウソウ	<i>Chamaele decumbens</i> (Thunb.) Makino		
198			ミツバ	<i>Cryptotaenia canadensis</i> (L.) DC. Subsp. <i>Japonica</i> (Hassk.) Hand.-Mazz.		
199			オオチドメ	<i>Hydrocotyle ramiflora</i> Maxim.		
200			セリ	<i>Oenanthe javanica</i> (Blume) DC.		
201			ヤブニンジン	<i>Osmorhiza aristata</i> (Thunb.) Rydb. var. <i>aristata</i>		
202			タニミツバ	<i>Sium serra</i>		VU
203			ミシマサイコ	<i>Bupleurum stenophyllum</i> (Nakai) Kitag.	VU	CR+EN
204			ハナウド	<i>Heracleum nipponicum</i>		NT
205			オオカサモチ	<i>Pleurospermum camtschaticum</i>		NT
206			シャク	<i>Anthriscus aemula</i>		
207			ホタルサイコ	<i>Bupleurum longiradiatum</i> f. <i>elatius</i>		NT
208		Diapensiaceae	オオイワカガミ	<i>Schizocodon soldanelloides</i> var. <i>magnus</i>		VU
209		Clethraceae	リョウブ	<i>Clethra barbinervis</i> Siebold et Zucc.		
210		Ericaceae	サラサドウダン	<i>Enkianthus campanulatus</i>		
211			ヤマツツジ	<i>Rhododendron kaempferi</i> Planch.		
212		Myrsinaceae	ヤブコウジ	<i>Ardisia japonica</i> (Thunb.) Blume		
213		Primulaceae	コナスビ	<i>Lysimachia japonica</i> f. <i>subsessilis</i>		
214			ヤナギトラノオ	<i>Lysimachia thyrsiflora</i> L.		VU
215			サクランウ	<i>Primula sieboldii</i>	NT	CR+EN
216		Ebenaceae	マメガキ	<i>Diospyros lotus</i> L.		

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217			カキノキ	<i>Diospyros kaki</i>		
218		Styracaceae	エゴノキ	<i>Styrax japonica</i> Siebold et Zucc.		
219			マルバアオダモ	<i>Fraxinus sieboldiana</i> Blume		
220			ネズミモチ	<i>Ligustrum japonicum</i> Thunb.		
221			イボタノキ	<i>Ligustrum obtusifolium</i> Siebold et Zucc.		
222		Loganiaceae	アイナエ	<i>Mitrasacme pygmaea</i> R.Br.		CR+EN
223		GeNTianaceae	コケリンドウ	<i>GeNTiana squarrosa</i>		CR+EN
224			イヌセンブリ	<i>Sweritia tosaensis</i> Makino	VU	VU
225		MenyaNThaceae	ガガブタ	<i>Nymphoides indica</i> (L.) KuNTze	NT	CR+EN
226			ヒメシロアサザ	<i>Nymphoides coreana</i>	VU	VU
227			アサザ	<i>Nymphoides peltata</i>	NT	VU
228		Apocynaceae	チョウジソウ	<i>Amsonia elliptica</i>	NT	CR+EN
229		Asclepiadaceae	ガガイモ	<i>Metaplexis japonica</i> (Thunb.) Makino		
230			スズサイコ	<i>Vincetoxicum pycnostelma</i> Kitag.	NT	VU
231			ココモメヅル	<i>Tylophora floribunda</i>		VU
232		Rubiaceae	ヤエムグラ	<i>Galium spurium</i> L. var. <i>echinospermon</i> (Wallr.) Hayek		
233			ヤイトバナ (ハクハダ)	<i>Paederia scandens</i> (Lour.) Merr. var. <i>Scandens</i>		
234			アカネ	<i>Rubia argyi</i> (H.Lév. et Vaniot) H.Hara ex Lauener		
235			ハナムグラ	<i>Galium tokyoense</i>	VU	CR+EN
236			オオキスタソウ	<i>Rubia chinensis</i> var. <i>glabrescens</i>		NT
237			ConvovUlucaceae	マメダオシ	<i>Cuscuta australis</i> R.Br.	CR
238		Boraginaceae	ルリソウ	<i>Omphalodes krameri</i>		NT
239		Verbenaceae	コムラサキ	<i>Callicarpa dichotoma</i> (Lour.) K.Koch		
240			ムラサキシキブ	<i>Callicarpa japonica</i> Thunb. var. <i>japonica</i>		
241		Lamiaceae	キランソウ	<i>Ajuga decumbens</i>		
242			カキドオシ	<i>Glechoma hederacea</i> L. subsp. <i>grandis</i> (A.Gray) H.Hara		
243			オランダハッカ	<i>MeNTha spicata</i> var. <i>crispa</i>		
244			コショウハッカ	<i>MeNTha x piperita</i>		
245			ヤマジソ	<i>Mosla japonica</i>	NT	VU
246			タイリンヤマハッカ	<i>Isodon umbrosus</i> (Maxim.) H.Hara var. <i>excisiflexus</i> (Nakai) K. Asano		NT
247		Solanaceae	クコ	<i>Lycium chinense</i> Mill.		
248			ホオズキ	<i>Physalis alkekengi</i> L. var. <i>franchetii</i> (Mast.) Makino		
249			ヤマホロシ	<i>Solanum japonense</i>		VU
250			イヌホオズキ	<i>Solanum nigrum</i>		
251		Scrophulariaceae	マルバノサワトウガラシ	<i>Deinostema adenocaulum</i> (Maxim.) T.Yamaz.	VU	VU
252			アブノメ	<i>Dopatrium junceum</i> (Roxb.) Buch. -Ham. ex BeNTh.		VU
253			オオアブノメ	<i>Gratiola japonica</i> Miq.	VU	Species requiring attention
254			スズメノトウガラシ	<i>Lindernia aNTipoda</i> (L.) Alston		NT
255			サギゴケ (ハナサキサギゴケ)	<i>Mazus miquelii</i> Makino		NT
256			トキワハゼ	<i>Mazus pumilus</i> (Burm.f.) Steenis		
257			タチイヌノフグリ	<i>Veronica arvensis</i> L.		
258			オオイヌノフグリ	<i>Veronica persica</i> Poir.		
259			ゴマノハグサ	<i>Scrophularia buergeriana</i>	VU	VU
260			ミヤマシオガマ	<i>Pedicularis apodochila</i>		VU
261		Orobanchaceae	キヨシミウツボ	<i>PhacellaNThus tubiflorus</i>		VU
262			ハマウツボ	<i>Orobanche coerulescens</i>	VU	NT
263		LeNTibulariaceae	ミミカキグサ	<i>Utricularia bifida</i> L.		CR+EN
264			ホザキノミミカキグサ	<i>Utricularia caerulea</i>		CR+EN
265			ムラサキミミカキグサ	<i>Utricularia uliginosa</i>	NT	NT
266			イヌタヌキモ	<i>Utricularia australis</i> R.Br.	NT	VU
267			タヌキモ	<i>Utricularia VUlgaris</i> L. var. <i>japonica</i> (Makino) Tamura	NT	CR+EN
268		Phrymaceae	ハエドクソウ	<i>Phryma leptostachya</i> L. subsp. <i>asiatica</i> (H.Hara) Kitam.		
269		PlaNTaginaceae	オオバコ	<i>PlaNTago asiatica</i> L.		
270		Caprifoliaceae	クロミノウグイスカグラ	<i>Lonicera caerulea</i> ssp. <i>edulis</i> var. <i>emphylocalyx</i>		NT
271			スイズラ	<i>Lonicera japonica</i> Thunb.		
272			ニワトコ	<i>Sambucus racemosa</i> L. subsp. <i>sieboldiana</i> (Miq.) H.Hara		
273			ガマズミ	<i>Viburnum dilatatum</i> Thunb.		
274		Campanulaceae	ミゾカクシ (アゼムシロ)	<i>Lobelia chinensis</i> Lour.		
275		Campanulaceae	キキョウ	<i>Platycodon grandiflorus</i> (Jacq.) A.DC	VU	VU
276			ツルニンジン	<i>Codonopsis lanceolata</i>		
277		Asteraceae	ヨモギ	<i>Artemisia indica</i> Willd. var. <i>maximowiczii</i> (Nakai) H.Hara		
278			ノコンギク (シロバナノコンギク)	<i>Aster microcephalus</i> (Miq.) Franch. Et Sav. var. <i>ovatus</i> (Franch. et Sav.) Soejima et Mot.Ito		
279			ヒメジョオン	<i>Erigeron annuus</i> (L.) Pers.		
280			ハルジオン	<i>Erigeron philadelphicus</i> L.		
281			アズマギク	<i>Erigeron thunbergii</i> A.Gray		VU
282			ノニガナ	<i>Ixeris polycephala</i>		NT
283			フキ	<i>Petasites japonicus</i> (Siebold et Zucc.) Maxim. Subsp. <i>japonicus</i>		
284			ハハコグサ	<i>Pseudognaphalium affine</i> (D.Don) Anderb.		
285			アキノハハコグサ	<i>Pseudognaphalium hypoleucum</i> (DC.) Hilliard et B.L.Burt	EN	VU
286			ノボロギク	<i>Senecio nemorensis</i> L.		
287			アオヤギバナ	<i>Solidago yokusaiana</i>		VU
288			セイヨウタンポポ	<i>Taraxacum officinale</i> Weber ex F.H.wigg.		
289			オナモミ	<i>XaNThium sibiricum</i> Patrín ex Widder	VU	VU

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290			オニタビラコ	<i>Youngia japonica</i> (L.) DC.		
291			ムラサキニガナ (広義)	<i>Paraprenanthes sororia</i> (Miq.) C. Shih		NT
292			モミジガサ	<i>Parasenecio delphinifolius</i> (Siebold et Zucc.) H. Koyama		
293			オオニガナ	<i>Prenanthes tanakae</i>		NT
294		Stachyuraceae	キブシ	<i>Stachyurus praecox</i>		
295	Liliopsida	Alismataceae	アギナシ	<i>Sagittaria aginashi</i> Makino	NT	VU
296			マルバオモダカ	<i>Caldesia parnassifolia</i> (Bassi. ex L.) Parl.	VU	CR+EN
297			サジオモダカ	<i>Alisma plantago-aquatica</i> var. <i>orientale</i>		NT
298		Hydrocharitaceae	コウガイモ	<i>Vallisneria denserrulata</i> (Makino) Makino		CR+EN
299			セキショウモ	<i>Vallisneria natans</i> (Lour.) H. Hara		CR+EN
300			トチカガミ	<i>Hydrocharis dubia</i> (Blume) Backer	NT	CR+EN
301			ミズオオバコ	<i>Otelia japonica</i>	VU	NT
302		Potamogetonaceae	コバノヒルムシロ	<i>Potamogeton cristatus</i> Regel et Maack	VU	VU
303			エゾノヒルムシロ	<i>Potamogeton heterophyllus</i>		VU
304			センニンモ	<i>Potamogeton maackianus</i> A. Benn.		VU
305			ホソバミズヒキモ	<i>Potamogeton octandrus</i> Poir. var. <i>octandrus</i>		VU
306			イトモ	<i>Potamogeton pusillus</i>	NT	Species requiring attention
307			ミズヒキモ	<i>Potamogeton octandrus</i> var. <i>miduhikimo</i> (Makino) H. Hara		VU
308			ホソバヒルムシロ	<i>Potamogeton alpinus</i>	VU	CR+EN
309			エゾヤナギモ	<i>Potamogeton compressus</i> L.		CR+EN
310			ササバモ	<i>Potamogeton wrightii</i> Morong		CR+EN
311		Najadaceae	ホッソモ	<i>Najas graminea</i> Delile		VU
312			ムサシモ	<i>Najas ancistocarpa</i>	EN	CR+EN
313			トリゲモ	<i>Najas minor</i> All.	VU	CR+EN
314			オオトリゲモ	<i>Najas oguraensis</i> Miki		CR+EN
315		Tofieldiaceae	チシマゼキショウ	<i>Tofieldia coccinea</i>		VU
316		Liliaceae	コバギボウシ	<i>Hosta sieboldii</i> (Paxton) J.W. Ingram var. <i>sieboldii</i> <i>Lspatulata</i> (Miq.) W.G. Schmid		
317			ヒメヤブラン	<i>Liriope minor</i> (Maxim.) Makino		
318			ジャノヒゲ	<i>Ophiopogon japonicus</i> (Thunb.) Ker Gawl. var. <i>japonicus</i>		
319			ホウチャクソウ	<i>Disporum sessile</i> D. Don ex Schult. et Schult. f.		
320			オモト	<i>Rohdea japonica</i> (Thunb.) Roth		
321			ユキザサ	<i>Smilacina japonica</i>		
322			オニユリ	<i>Lilium lancifolium</i>		
323			マイヅルソウ	<i>Maianthemum dilatatum</i>		
324		Dioscoreaceae	オニドコロ	<i>Dioscorea tokoro</i> Makino		
325			ナガイモ	<i>Dioscorea polystachya</i>		
326		PoNTederiaceae	ミズアオイ	<i>Monochoria korsakowii</i>	NT	
327		Iridaceae	ヒメシャガ	<i>Iris gracilipes</i>		NT
328			キショウブ	<i>Iris pseudacorus</i> L.		
329			アヤメ	<i>Iris sanguinea</i>		NT
330		Commelinaceae	ツユクサ	<i>Commelina communis</i> L.		
331		Poaceae	ハルガヤ	<i>Anthoxanthum odoratum</i> L.		
332			コブナグサ	<i>Arthraxon hispidus</i> (Thunb.) Makino		
333			メヒシバ	<i>Digitaria ciliaris</i> (Retz.) Koeler		
334			オヒシバ	<i>Eleusine indica</i> (L.) Gaertn.		
335			カモジグサ	<i>Elymus tsukushiensis</i> Honda var. <i>transiens</i> (Hack.) Osada		
336			ウキガヤ	<i>Glyceria depauperata</i> Ohwi var. <i>infirma</i> (Ohwi) Ohwi		NT
337			カラフトドジョウツナギ	<i>Glyceria lithuanica</i>		NT
338			ネズミムギ (エダウチネズミ)	<i>Lolium multiflorum</i> Lam.		
339			スズメノカタビラ	<i>Poa annua</i> L. var. <i>annua</i>		
340			ヤマルリトラノオ	<i>Pseudolysimachion kiusianum</i> ssp. <i>miyabei</i> var. <i>japonica</i>		VU
341			イネ	<i>Oryza sativa</i> L.		
342			ジュズダマ	<i>Coix lacryma-jobi</i>		
343		Araceae	カラスビシャク	<i>Pinellia ternata</i> (Thunb.) Breitenb.		
344			マイヅルテンナンショウ	<i>Arisaema heterophyllum</i>	VU	CR+EN
345			ザゼンソウ	<i>Symplocarpus foetidus</i> var. <i>latissimus</i>		CR+EN
346			ヒメカイウ	<i>Calla palustris</i>	NT	CR+EN
347		Lemnaceae	キセワタ	<i>Leonurus macranthus</i>	VU	VU
348		Sparganiaceae Hanin	ミクリ	<i>Sparganium erectum</i> L. var. <i>erectum</i>	NT	NT
349			オオミクリ	<i>Sparganium erectum</i> L. var. <i>macrocarpum</i> (Makino) H. Hara	VU	CR+EN
350			タマミクリ	<i>Sparganium glomeratum</i> (Beurl. ex Laest.) L.M. Newman var. <i>glomeratum</i>	NT	CR+EN
351			ナガエミクリ	<i>Sparganium japonicum</i> Rothert	NT	NT
352			ヒメミクリ	<i>Sparganium stenophyllum</i>	VU	VU
353			エゾミクリ	<i>Sparganium emersum</i> Rehm.		CR+EN
354		Cyperaceae	ムジナスゲ	<i>Carex lasiocarpa</i> var. <i>occultans</i>		VU
355			ヌマクロボスゲ	<i>Carex meyeriana</i>	VU	VU
356			カンスゲ	<i>Carex morrowii</i>		CR+EN
357			トネテンツキ	<i>Fimbristylis stauTonii</i> Debeaux et Franch. var. <i>tonensis</i> (Makino) Ohwi ex T. Koyama	VU	CR+EN
358			ツルスゲ	<i>Carex pseudocuraica</i> F. Schmidt		NT
359			オニナルコスゲ	<i>Carex vesicaria</i>		NT
360			カワラスガナ	<i>Cyperus sanguinolentus</i> Vahl	NT	VU
361		Orchidaceae	エビネ	<i>Calanthe discolor</i> Lindl.	NT	VU
362			サルメンエビネ	<i>Calanthe tricarinata</i>	VU	CR+EN

No.	class	family	species		category in Red List in Japan	
			Japanese name	scientific name	National (MOE)	Local (Miyagi pref.)
363			キンラン	<i>Cephalanthera falcata</i> (Thunb.) Blume	VU	VU
364			エゾスズラン	<i>Epipactis papillosa</i>		NT
365			ヒロハツリシュスラン	<i>Goodyera pendula</i> var. <i>brachyphylla</i>	EN	CR+EN
366			ムカゴソウ	<i>Herminium lanceum</i> (Thunb. ex Sw.) J. VUjick	EN	VU
367			ギボウシラン	<i>Liparis auriculata</i>	EN	CR+EN
368			フガクスズムシソウ	<i>Liparis fujisanensis</i>	VU	CR+EN
369			セイタカスズムシソウ	<i>Liparis japonica</i>		CR+EN
370			ジガバチソウ	<i>Liparis krameri</i>		NT
371			ミズチドリ	<i>Platanthera hologlottis</i> Maxim.		VU
372			トキシソウ	<i>Pogonia japonica</i> Rchb.f.	NT	VU
373			ヤマトキシソウ	<i>Pogonia minor</i> (Makino) Makino		CR+EN
374			ヤマサギソウ	<i>Platanthera mandarinorum</i> var. <i>brachyceptron</i>		VU
375			マイサギソウ	<i>Platanthera mandarinorum</i> var. <i>neglecta</i>		CR+EN
376			コアニチドリ	<i>Amitostigma kinoshitae</i>	VU	CR+EN
377			ノビネチドリ	<i>Gymnadenia camtschatica</i>		VU
378			オオミズトンボ	<i>Habenaria linearifolia</i> var. <i>linearifolia</i>	EN	CR+EN
379			ミズトンボ	<i>Habenaria sagittifera</i>	VU	CR+EN
380			ヒナチドリ	<i>Orchis chidori</i>	VU	CR+EN
381			キンセイラン	<i>Calanthe nipponica</i>	VU	CR+EN
382			トケンラン	<i>Cremastra unguiculata</i>	VU	CR+EN
383			クマガイソウ	<i>Cypripedium japonicum</i>	VU	CR+EN
384			イチヨウラン	<i>Dactyloctenium aegyptium</i>		CR+EN

## (2) Insects

EX:Extinct EW:Extinct in the Wild CR:Critically Endangered EN:Endangered VU:Vulnerable NT:Near Threatened DD:Data Deficient  
LP: Local Population

No.	class	family	species		category in Red List in Japan	
			Japanese name	scientific name	National(MOE)	Local(Miyagi pref.)
1	Insecta	Lestidae	オオアオイトトンボ	<i>Lestes temporalis</i>		
2			オツネイトンボ	<i>Sympetma paedisca paedisca</i>		
3			コバネアオイトトンボ	<i>Lestes japonicus</i>	EN	CR+EN
4			ホソミオツネイトンボ	<i>Indolestes peregrinus</i>		
5		Agrionidae	アジイトトンボ	<i>Ischnura asiatica</i>		
6			オオイトトンボ	<i>Cercion sieboldii</i>		
7			オオセスジイトトンボ	<i>Cercion plagiosum</i>		
8			キイトトンボ	<i>Ceragrion melanurum</i>		
9			クロイトトンボ	<i>Cercion calamarum calamarum</i>		
10			エゾイトトンボ	<i>Coenagrion lanceolatum</i>		
11			オゼイトトンボ	<i>Coenagrion terue</i>		
12			カラカネイトトンボ	<i>Nehalennia speciosa</i>		CR+EN
13			セスジイトトンボ	<i>Cercion hieroglyphicum</i>		
14			モートンイトトンボ	<i>Mortonagrion selenion</i>		
15			ルリイトトンボ	<i>Enallagma boreale circulatum</i>		CR+EN
16			アオモンイトトンボ	<i>Ischnura senegalensis</i>		
17		Corduliidae	エゾトンボ	<i>Somatochlora viridiaenea</i>		VU
18			トラフトンボ	<i>Epitheca marginata</i>		
19			コヤマトンボ	<i>Macromia amphigena amphigena</i>		
20			タカネトンボ	<i>Somatochlora uchidai</i>		
21			オオヤマトンボ	<i>Epophthalmia elegans</i>		
22			ハネビロエゾトンボ	<i>Somatochlora clavata</i>		
23		Aeschnidae	ギンヤンマ	<i>Anax parthenope julius</i>		
24			ヤブヤンマ	<i>Polycanthagyna melanictera</i>		VU
25			オオルリボシヤンマ	<i>Aeschna nigroflava</i>		
26			サラサヤンマ	<i>Oligoaeschna pryeri</i>		
27			ミルンヤンマ	<i>Planaeschna milnei</i>		
28			ルリボシヤンマ	<i>Aeschna juncea</i>		
29			アヤンマ	<i>Aeschnophlebia longistigma</i>		
30			クロスジギンヤンマ	<i>Anax nigrofasciatus nigrofasciatus</i>		
31		マダラヤンマ	<i>Aeschna mixta</i>			
32		Cordulegastridae	オニヤンマ	<i>Anotogaster sieboldii</i>		
33		Calopterygidae	ヒガシカワトンボ	<i>Mnais pruinosa costalis</i>		
34			ハグロトンボ	<i>Calopteryx atrata</i>		
35		Gomphidae	ウチワヤンマ	<i>Ictinogomphus clavatus</i>		
36			ホンサナエ	<i>Gomphus postocularis</i>		VU
37			コオニヤンマ	<i>Sieboldius albardae</i>		
38			ダビドサナエ	<i>Davidius nanus</i>		
39			モイワサナエ	<i>Davidius moiwanus moiwanus</i>		
40			ヤマサナエ	<i>Asiagomphus melaenops</i>		
41			コサナエ	<i>Trigomphus melampus</i>		
42		Libellulidae	アキアカネ	<i>Sympetrum frequens</i>		
43			ウスバキトンボ	<i>Pantala flavescens</i>		
44			オオシオカラトンボ	<i>Orthetrum triangulare melania</i>		
45			キトンボ	<i>Sympetrum croceolum</i>		VU
46			ミヤマアカネ	<i>Sympetrum pedemontanum elatum</i>		
47			ヨツボシトンボ	<i>Libellula quadrimaculata asa - hinai</i>		
48			リスアカネ	<i>Sympetrum risi risi</i>		VU
49			コシアキトンボ	<i>Pseudothemis zonata</i>		
50			コフキトンボ	<i>Deielia phaon</i>		
51			シオカラトンボ	<i>Orthetrum albistylus speciosum</i>		
52			シオヤトンボ	<i>Orthetrum japonicum japonicum</i>		
53			ショウジョウトンボ	<i>Crocothemis servilia</i>		
54			チョウトンボ	<i>Rhyothemis fuliginosa</i>		
55			ナツアカネ	<i>Sympetrum darwinianum</i>		
56			ノシメトンボ	<i>Sympetrum infuscatum</i>		
57			ハラビロトンボ	<i>Lyriothemis pachygastra</i>		
58			ヒメアカネ	<i>Sympetrum parvulum</i>		CR+EN
59			マイコアカネ	<i>Sympetrum kunckeli</i>		
60		マユタテアカネ	<i>Sympetrum eroticum</i>			
61		Platycnemidae	モノサシトンボ	<i>Copera annulata</i>		
62		Belostomatidae	コオイムシ	<i>Appasus japonicus</i>	EN	NT
63		Pentatomidae	クロマダラナガガメムシ	<i>Heterogaster urtica</i>		NT
64			ホッケミズムシ	<i>Hesperocorixa distantii hokkensis</i>	NT	NT
65			タガメ	<i>Lethocerus deyrolle</i>	VU	CR+EN
66		Notonectidae	キイロマツモムシ	<i>Notonecta reuteri</i>		NT
67		Myrmeleontidae	ウスバカゲロウ	<i>Hagenomyia micans</i>		CR+EN
68		Carabidae	ツヤキベリアオゴミムシ	<i>Chlaenius spoliatus motschulskyi</i>	VU	VU
69			マークオサムシ	<i>Apotomopterus maacki aquatilis</i>	VU	CR+EN
70			アオヘリアオゴミムシ	<i>Chlaenius praefectus</i>	CR	

No.	class	family	species		category in Red List in Japan	
			Japanese name	scientific name	National(MOE)	Local(Miyagi pref.)
71			アカガネオサムシ	<i>Carabus granulatus telluris</i>	VU	NT
72			セアカオサムシ	<i>Hemicarabus tuberculatus</i>		NT
73			セアカヒラタゴミムシ	<i>Dolichus halensis</i>	NT	NT
74			チビアオゴミムシ	<i>Eochlaenius suvorovi</i>	EN	NT
75			チョウカイヒメクロオサムシ	<i>Leptocarabus opaculus shirahatai</i>		NT
76			オオハンミョウモドキ	<i>Elaphrus japonicus</i>		NT
77			アオホソゴミムシ	<i>Drypta ussuriensis</i>		VU
78			シラハタキバナゴミムシ	<i>Stomis zaonus</i>		DD
79		Brachinidae	アオバネホソクビゴミムシ	<i>Brachinus aeneicostis</i>		NT
80		Cicindelidae	カワラハンミョウ	<i>Cicindela laetescrpta</i>	EN	CR+EN
81			ホソハンミョウ	<i>Cicindela gracilis</i>	VU	NT
82		Dytiscidae	エゾゲンゴロウモドキ	<i>Dytiscus czerskii</i>	VU	VU
83			オオイチモンジシマゲンゴロウ	<i>Hydaticus pacificus conspersus</i>	EN	VU
84			メスジゲンゴロウ	<i>Acilius japonicus</i>		NT
85			ゲンゴロウ	<i>Cybister japonicus</i>	VU	NT
86		Silphidae	クロヒラタシテムシ	<i>Phosphuga atrata</i>		VU
87		Lucanidae	オオクワガタ	<i>Dorcus hopei</i>	VU	NT
88		Scarabaeidae	アカマダラハナムグリ	<i>Poecilophilides rusticola</i>	DD	NT
89		Lampyridae	ゲンジボタル	<i>Luciola cruciata</i>		NT
90			スジグロボタル	<i>Pristolycus sagulatus</i>		NT
91		Coccinellidae	アイヌテントウ	<i>Coccinella ainu</i>		NT
92		Cerambycidae	ヨツボシカミキリ	<i>Stenygrinus quadrinotatus</i>	EN	CR+EN
93			トラフホソバネカミキリ	<i>Thranus variegatus variegatus</i>		NT
94		Chrysomelidae	アカガネネクイハムシ	<i>Donacia hirtihumeralis</i>	NT	NT
95			オオルリハムシ	<i>Chrysolina virgata</i>	NT	NT
96		Anthribidae	トビイロヒョウタンゾウムシ	<i>Scepticus uniformis</i>		NT
97		Pyralidae	イタクラキノメイガ	<i>Uresiphitafusei</i>		DD
98			ツチイロツトガ	<i>Calamotropha doii</i>		DD
99		Sphingidae	マツクロスズメ本州亜種	<i>Hyloicus morio morio</i>		DD
100		Lymantriidae	フタホシドクガ	<i>Euproctis staudingeri</i>		NT
101		Noctuidae	オオチャバネヨトウ	<i>Nonagriapengeleri</i>	VU	NT
102			ガマヨトウ	<i>Archanaeraerata</i>	VU	NT
103			キスジウスキヨトウ	<i>Archanaresparganii</i>	VU	NT
104			ツマグロキヨトウ	<i>Aletia simplex</i>		NT
105			ヌマバウスキヨトウ	<i>Chilodespacificus</i>	VU	
106			キンタアツバ	<i>Hypena claripennis</i>	NT	NT
107			イチモジヒメヨトウ	<i>Xylomoia fusei</i>	VU	DD
108		Geometridae	フトスジエダシヤク	<i>Cleora repulsaria</i>		DD
109		Hesperiidae	ホンチャバネセセリ	<i>Aeromachus inachus inachus</i>	EN	VU
110			チャマダラセセリ	<i>Pyrgus maculatus maculatus</i>	EN	CR+EN
111		Nymphalidae	ウラギンスジヒョウモン	<i>Argyronome laodice japonica</i>	EN	
112		Lycaenidae	クロシジミ	<i>Niphanda fusca</i>	EN	CR+EN
113			ハヤシミドリシジミ	<i>Favonius ultramarinus</i>		NT
114			カラスシジミ	<i>Strymonidia w-album fentoni</i>		NT

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### (3) Fish species

EX:Extinct EW:Extinct in the Wild CR:Critically Endangered EN:Endangered VU:Vulnerable NT:Near Threatened DD:Data Deficient  
LP: Local Population

No.	class	family	species		category in Red List in Japan		
			Japanese name	scientific name	National(MOE)	Local(Miyagi pref.)	
1	Actinopterygii	Anguillidae	ニホンウナギ	<i>Anguilla japonica</i>	EN	NT	
2		Osmeridae	ワカサギ	<i>Hypomesus nipponensis</i>			
3		Plecoglossidae	アユ	<i>Plecoglossus altivelis altivelis</i>			
4		Salmonidae	ギンザケ	<i>Oncorhynchus kisutch</i>			
5			サケ	<i>Oncorhynchus keta</i>			
6			ニジマス	<i>Oncorhynchus mykiss</i>			
7			エゾイワナ	<i>Salvelinus leucomaenis leucomaenis</i>			
8			アメマス	<i>Salvelinus leucomaenis leucomaenis</i>			
9			ニッコウイワナ	<i>Salvelinus leucomaenis pluvius</i>	DD		
10			ヤマメ	<i>Oncorhynchus masou masou</i>			
11			サクラマス	<i>Oncorhynchus masou masou</i>	NT	NT	
12			Cyprinidae	オイカワ	<i>Zacco platypus</i>		
13				ハス	<i>Opsariichthys uncirostris</i>	VU	
14				アブラハヤ	<i>Rhynchocypris logowskii steindachneri</i>		
15				タカハヤ	<i>Phoxinus oxycephalus jouyi</i>		
16		ウグイ		<i>Tribolodon hakonensis</i>			
17		ソウギョ		<i>Ctenopharyngodon idellus</i>			
18		ハクレン		<i>Hypophthalmichthys molitrix</i>			
19		タモロコ		<i>Gnathopogon elongatus</i>			
20		シナイモツゴ		<i>Pseudorasbora pumila pumila</i>	CR	CR+EN	
21		モツゴ		<i>Pseudorasbora parva</i>			
22		ビワヒガイ		<i>Sarcocheilichthys variegatus microoculus</i>			
23		カマツカ		<i>Pseudogobio esocinus</i>			
24		ニゴイ		<i>Hemibarbus barbus</i>			
25		コイ		<i>Cyprinus carpio</i>			
26		キンブナ		<i>Carassius auratus</i> subsp. 2	VU	NT	
27		ギンブナ		<i>Carassius auratus langsdorfii</i>			
28		ゲンゴロウブナ		<i>Carassius cuvieri</i>			
29		テツギョ		<i>Carassius auratus</i>		CR+EN	
30		タイリクバラタナゴ		<i>Rhodeus ocellatus ocellatus</i>			
31		カネヒラ		<i>Acheilognathus rhombeus</i>			
32		ゼニタナゴ		<i>Acheilognathus typus</i>	CR	CR+EN	
33		タナゴ		<i>Acheilognathus melanogaster</i>	EN	CR+EN	
34		ヤリタナゴ		<i>Tanakia lanceolata</i>	NT	CR+EN	
35		アカヒレタビラ		<i>Acheilognathus tabira erythropterus</i>	EN	CR+EN	
36		Cobitidae		カラドジョウ	<i>Paramisgurnus dabryanus</i>		
37				シマドジョウ	<i>Cobitis biwae</i>		
38				ドジョウ	<i>Misgurnus anguillicaudatus</i>	DD	
39		Balitoridae		ホトケドジョウ	<i>Lefua echigonia</i>	EN	NT
40		Bagridae	ギバチ	<i>Pseudobagrus tokiensis</i>	VU	NT	
41			ギギ	<i>Pseudobagrus nudiceps</i>			
42		Siluridae	ナマズ	<i>Silurus asotus</i>			
43		Adrianchthyidae	メダカ	<i>Oryzias latipes</i>	VU	NT	
44		Mugilidae	ボラ	<i>Mugil cephalus</i>			
45		Cottidae	カジカ	<i>Cottus pollux</i>	NT		
46			ハナカジカ	<i>Cottus nozawae</i>	LP	CR+EN	
47		Centrarchidae	オオクチバス	<i>Micropterus salmoides</i>			
48			コクチバス	<i>Micropterus dolomieu</i>			
49			ブルーギル	<i>Lepomis macrochirus</i>			
50		Channidae	カムルチー	<i>Channa argus</i>			
51		Gobiidae	トウヨシノボリ	<i>Rhinogobius kurodai</i>			
52			シマヨシノボリ	<i>Rhinogobius nagoyae</i>			
53			オオヨシノボリ	<i>Rhinogobius sp. LD</i>			
54			ジュズカケハゼ	<i>Chaenogobius laevis</i>	NT		
55			ウキゴリ	<i>Gymnogobius urotaenia</i>			
56			ヌマチチブ	<i>Tridentiger brevispinis</i>			
57			アシシロハゼ	<i>Acanthogobius lactipes</i>			
58			マハゼ	<i>Acanthogobius flavimamus</i>			
59			ルリヨシノボリ	<i>Rhinogobius sp.CO</i>		VU	
60		Cephalaspidomorphi	Petromyzontidae	スナヤツメ	<i>Lethenteron reissneri</i>		NT
61		Gastropoda	Viviparidae	マルタニシ	<i>Cipangopaludina chinensis laeta</i>	VU	DD
62				オオタニシ	<i>Cipangopaludina japonica</i>	NT	DD
63				ヒメタニシ	<i>Sinotaia quadrata histrica</i>		
64			Pleuroceridae	チリメンカワニナ	<i>Semisulcospira libertina</i>		NT
65				カワニナ	<i>Semisulcospira libertina</i>		
66			Lymnaeidae	ヒメモノアラガイ	<i>Austropeplea ollula</i>		
67				モノアラガイ	<i>Limnaea auricularia</i>	NT	
68			Physidae	サカマキガイ	<i>Physa acuta</i>		
69			Ferrissidae	カワコザラガイ	<i>Leavapex nipponica</i>		
70			Unionidae	マツカサガイ	<i>Inversidena japonensis</i>	NT	

No.	class	family	species		category in Red List in Japan		
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71			イシガイ	<i>Unio douglasiae</i>			
72			タガイ	<i>Anodonta japonica</i>			
73			ヌマガイ	<i>Anodonta lauta</i>		NT	
74		Cyrenidae	マシジミ	<i>Corbicula leana</i>	NT		
75			タイワンシジミ	<i>Corbicula fluminea</i>			
76			マメシジミ類	<i>Pisidium spp.</i>			
77		Spheridae	ドブシジミ	<i>Sphaerium japonica</i>			
78		Succineidae	オカモノアラガイ	<i>Succinea lauta</i>			
79		Planorbidae	ヒラマキミズマイマイ	<i>Gyraulus chinensis</i>	DD		
80			ヒラマキガイモドキ	<i>Polypylis hemisphaerula</i>	NT		
81		Bradybaenidae	ウスカワマイマイ種群	<i>Acusta despecta</i>			
82		Limacidae	チャコウラナメクジ	<i>Limax marginatus</i>			
83		Philomycidae	ナメクジ	<i>Inclaria bilineata</i>			
84	Malacostraca	Cambaridae	ニッポンヨコエビ	<i>Gammarus nipponensis</i>			
85			オオエゾヨコエビ	<i>Jesogammarus jesoensis(Schellenberg)</i>			
86		Atyidae	スカエビ	<i>Paratya compressa improvisa</i>			
87		Palaemonidae	テナガエビ	<i>Macrobrachium nipponense</i>			
88			スジエビ	<i>Palaemon paucidens</i>			
89		Arthropoda		アメリカザリガニ	<i>Scapulicambarus clarkii</i>		
90		Potamidae		サワガニ	<i>Geothelphusa dehaani</i>		
91		Varunidae		モクズガニ	<i>Eriocheir japonicus</i>		

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#### (4) Amphibian, reptile, and mammal species

EX: Extinct EW: Extinct in the Wild CR: Critically Endangered EN: Endangered VU: Vulnerable NT: Near Threatened DD: Data Deficient LP: Local Population

No.	class	family	species		category in Red List in Japan		Natural Monument (Nationally Designated)
			Japanese name	scientific name	National(MOE)	Local(Miyagi pref.)	
1	Amphibia	Hynobiidae	トウホクサンショウウオ	<i>Hynobius lichenatus</i>	NT	NT	
2			クロサンショウウオ	<i>Hynobius nigrescens</i>	NT	LP	
3			キタオウシュウサンショウウオ	<i>Onychodactylus nipponoborealis</i>		Species requiring attention	
4		Salamandridae	アカハライモリ	<i>Cynops pyrrhogaster</i>	NT	LP	
5		Bufo	アズマヒキガエル	<i>Bufo japonicus formosus</i>			
6		Hylidae	ニホンアマガエル	<i>Hyla japonica</i>			
7		Ranidae	ウシガエル	<i>Rana catesbeiana</i>			
8			ニホンアカガエル	<i>Rana japonica</i>			
9			ヤマアカガエル	<i>Rana ornativentris</i>			
10			タゴガエル	<i>Rana tagoi tagoi</i>			
11			トウキョウダルマガエル	<i>Rana porosa porosa</i>	NT	NT	
12			ツチガエル	<i>Rana rugosa</i>		NT	
13		Rhacophoridae	シュレーゲルアオガエル	<i>Rhacophorus schlegelii</i>			
14			モリアオガエル	<i>Rhacophorus arboreus</i>			
15			カジカガエル	<i>Buergeria buergeri</i>			
16	Reptilia	Geoemydidae	クサガメ	<i>Chinemys reevesii</i>		DD	
17		Emydidae	ミシシippiaアカミミガメ	<i>Trachemys scripta elegans</i>			
18		Trionychidae	ニホンスッポン	<i>Pelodiscus sinensis</i>	DD	DD	
19		Scincidae	ヒガシニホトカゲ	<i>Plestiodon finitimus</i>			
20		Lacertidae	ニホンカナヘビ	<i>Takydromus tachydromoides</i>			
21		Natricidae	ヒバカリ	<i>Amphisma vibakari vibakari</i>			
22			ヤマカガシ	<i>Rhabdophis tigrinus</i>			
23		Colubridae	シロマダラ	<i>Dinodon orientale</i>		DD	
24			アオダイショウ	<i>Elaphe climacophora</i>			
25			シマヘビ	<i>Elaphe quadrivirgata</i>			
26			ジムグリ	<i>Elaphe conspicillata</i>			
27		Viperidae	ニホンマムシ	<i>Gloydius blomhoffii</i>			
28		Xenodermatidae	タカチホヘビ	<i>Achalinus spinalis</i>		DD	
29	Mammalia	Soricidae	シントウトガリネズミ	<i>Sorex shinto shinto</i>		DD	
30			カワネズミ	<i>Chimarrogale himalayica platycephala</i>		DD	
31			ニホンジネズミ	<i>Crocidura dsinezumi</i>			
32		Talpidae	ヒミズ	<i>Urotrichus talpoides</i>			
33			ヒメヒミズ	<i>Dymecodon pilirostris</i>			
34			アズマモグラ	<i>Mogera imaizumii</i>			
35		Rhinolophidae	キクガシラコウモリ	<i>Rhinolophus ferrumequinim</i>			
36		Vespertilionidae	モモジロコウモリ	<i>Myotis macrodactylus</i>			
37			ヒメホオヒゲコウモリ	<i>Myotis ikonnikovi</i>		VU	
38			クロホオヒゲコウモリ	<i>Myotis pruinus</i>	VU		
39			カグヤコウモリ	<i>Myotis frater kaguyae</i>		CR+EN	
40			イエコウモリ	<i>Pipistrellus abramus</i>			
41			ヤマコウモリ	<i>Nyctalus aviator</i>	VU	VU	
42			ヒナコウモリ	<i>Vespertilio sinensis</i>		VU	
43		ウサギコウモリ	<i>Plecotus auritus sacrimontis</i>		VU		
44		Cercopithecidae	ニホンザル	<i>Macaca fuscata</i>			
45		Canidae	キツネ	<i>Vulpes vulpes</i>			
46			タヌキ	<i>Nyctereutes procyonoides</i>			
47		Ursidae	ツキノワグマ	<i>Ursus thibetanus</i>			
48		Mustelidae	テン	<i>Martes melampus</i>			
49			ニホンイタチ	<i>Mustela itatsi</i>			
50			オコジョ	<i>Mustela erminea nippon</i>	NT	NT	
51			アナグマ	<i>Meles anakuma</i>			
52	Viverridae	ハクビシン	<i>Paguma larvata</i>				
53	Bovidae	ニホンカモシカ	<i>Capricornis crispus</i>		Species requiring attention	SP	
54	Sciuridae	タイワンリス	<i>Callosciurus erythraeus taiwanensis</i>				
55		ニホンリス	<i>Sciurus lis</i>				

56		モモンガ	<i>Pteromys momonga</i>			
57		ムササビ	<i>Petaurista leucogenys</i>			
58	Muridae	ハタネズミ	<i>Microtus montebelli</i>			
59		ヤチネズミ	<i>Eothenomys andersoni</i>			
60		アカネズミ	<i>Apodemus speciosus</i>			
61		ヒメネズミ	<i>Apodemus argenteus</i>			
62		ハツカネズミ	<i>Mus musculus</i>			
63		ドブネズミ	<i>Rattus norvegicus</i>			
64	Leporidae	ノウサギ	<i>Lepus brachyurus</i>			

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## (5) Bird species

SP: Special Protected Species PS: Protected Species

EX: Extinct EW: Extinct in the Wild CR: Critically Endangered EN: Endangered VU: Vulnerable NT: Near Threatened DD: Data Deficient LP: Local Population

No.	class	family	species		category in Red List in Japan		Natural Monument (Nationally Designated)	
			Japanese name	scientific name	National(MOE)	Local(Miyagi pref.)		
1	Aves	Podicipedidae	カイツブリ	<i>Podiceps ruficollis</i>				
2			ハジロカイツブリ	<i>Podiceps ruficollis</i>				
3			ミミカイツブリ	<i>Podiceps auritus</i>				
4			カンムリカイツブリ	<i>Podiceps cristatus</i>				
5		Phalacrocoracidae	カワウ	<i>Phalacrocorax carbo hanedae</i>				
6			ウミウ	<i>Phalacrocorax capillatus</i>				
7		Ardeidae	サンカノゴイ	<i>Botaurus stellaris</i>	EN	NT		
8			ミゾゴイ	<i>Gorsachius goisagi</i>				
9			ヨシゴイ	<i>Ixobrychus sinensis</i>	NT	NT		
10			オオヨシゴイ	<i>Ixobrychus eurhythmus</i>	CR	CR+EN		
11			ゴイサギ	<i>Nycticorax nycticorax</i>				
12			ササゴイ	<i>Butorides striatus</i>				
13			カラシラサギ	<i>Egretta eulophotes</i>				
14			アカガシラサギ	<i>Ardeola bacchus</i>				
15			アマサギ	<i>bubulcus ibis</i>				
16			ダイサギ	<i>Egretta alba</i>				
17			チュウサギ	<i>Egretta intermedia</i>	NT	NT		
18			コサギ	<i>Egretta garzetta</i>				
19			アオサギ	<i>Ardea cinerea</i>				
20			ムラサキサギ	<i>Ardea purpurea</i>				
21		Ciconiidae	コウノトリ	<i>Ciconia ciconia</i>	CR		SP	
22		Threskiornithinae	ヘラサギ	<i>Platalea leucorodia</i>	DD	Species requiring attention		
23		Anatidae	シジュウカラガン	<i>Branta canadensis</i>	CR	CR+EN		
24			コクガン	<i>Branta bernicla</i>	VU	VU	PS	
25			マガン	<i>Anser albifrons</i>	NT	NT	PS	
26			カリガネ	<i>Anser erythropus</i>	EN	NT		
27			ヒシクイ (垂種ヒシクイ)	<i>Anser fabalis serratirostris</i>	VU	NT	PS	
28			ヒシクイ (オオヒシクイ)	<i>Anser fabalis middendorffii</i>	NT	NT	PS	
29			ハクガン	<i>Anser caerulescens</i>	CR	Species requiring attention		
30			ハイイロガン	<i>Anser anser</i>				
31			サカツラガン	<i>Anser cygnoides</i>	DD	Species requiring attention		
32			コブハクチョウ	<i>Cygnus olor</i>				
33			オオハクチョウ	<i>Cygnus cygnus</i>				
34			コハクチョウ	<i>Cygnus columbianus</i>				
35			オシドリ	<i>Aix galericulate</i>	DD			
36			マガモ	<i>Anas platyrhynchos</i>				
37			カルガモ	<i>Anas poecilorhyncha</i>				
38			シノリガモ	<i>Histrionicus histrionicus</i>				
39			オオヨシガモ	<i>Anas falcata</i>				
40			ウミアイサ	<i>Mergus serrator</i>				
41			コガモ	<i>Anas crecca</i>				
42			トモエガモ	<i>Anas formosa</i>	VU			
43			ヨシガモ	<i>Anas falcata</i>				
44			オカヨシガモ	<i>Anas strepera</i>				
45			ヒドリガモ	<i>Anas penelope</i>				
46			アメリカヒドリ	<i>Anas americana</i>				
47			オナガガモ	<i>Anas acuta</i>				
48			シマアジ	<i>Anas querquedula</i>				
49			ハシビロガモ	<i>Anas clypeata</i>				
50			ホシハジロ	<i>Aythya ferina</i>				
51			オオホシハジロ	<i>Aythya valisineria</i>				
52			スズガモ	<i>Aythya marila</i>				
53			キンクロハジロ	<i>Aythya fuligula</i>				
54			ホオジロガモ	<i>Bucephala clangula</i>				
55			ミコアイサ	<i>Mergus albellus</i>				
56			カワアイサ	<i>Mergus merganser</i>				
57			Accipitridae	ミサゴ	<i>Pardion haliaetus</i>	NT		
58				イヌワシ	<i>Aquila chrysaetos</i>			
59		カタシロワシ		<i>Aquila heliaca</i>				
60		ハチクマ		<i>Pernis apivorus</i>	NT	NT		
61		トビ		<i>Milvus migrans</i>				
62		オジロワシ		<i>Haliaeetus albicilla</i>	VU	VU	PS	
63		オオワシ		<i>Haliaeetus pelagicus</i>	VU	VU	PS	
64		オオタカ		<i>Accipiter gentilis</i>	NT	NT		

No.	class	family	species		category in Red List in Japan		Natural Monument (Nationally Designated)
			Japanese name	scientific name	National(MOE)	Local(Miyagi pref.)	
65			ツミ	<i>Accipiter gularis</i>		DD	
66			ハイタカ	<i>Accipiter nisus</i>	NT	NT	
67			ケアシノスリ	<i>Buteo lagopus</i>			
68			ノスリ	<i>Buteo buteo</i>			
69			サシバ	<i>Butastur indicus</i>	VU	VU	
70			クマタカ	<i>Spizaetus nipalensis</i>	EN	CR+EN	
71			ハイイロチュウヒ	<i>Circus cyaneus</i>			
72			チュウヒ	<i>Circus aeruginosus</i>	EN	NT	
73		Falconidae	ハヤブサ	<i>Falco peregrinus</i>	VU	NT	
74			シロハヤブサ	<i>Falco rusticolus</i>			
75			チゴハヤブサ	<i>Falco subbuteo</i>		Species requiring attention	
76			コチョウゲンボウ	<i>Falco columbarius</i>			
77			チョウゲンボウ	<i>Falco tinnunculus</i>			
78		Phasianidae	ウズラ	<i>Coturnix coturnix</i>	VU	CR+EN	
79			コジュケイ	<i>Bambusicola thoracica</i>			
80			ヤマドリ	<i>Phasianus soemmerringii</i>			
81			キジ	<i>Phasianus colchicus</i>			
82		Gruidae	タンチョウ	<i>Grus japonensis</i>	VU		SP
83			カナダヅル	<i>Grus canadensis</i>			
84			ナベヅル	<i>Grus monacha</i>			
85			マナヅル	<i>Grus vipio</i>	VU		
86			クイナ	<i>Rallus aquaticus</i>		Species requiring attention	
87			ヒメクイナ	<i>Porzana pusilla</i>		Species requiring attention	
88			ヒクイナ	<i>Porzana fusca</i>	NT		
89			シマクイナ	<i>Porzana eximilis</i>	EN		
90			バン	<i>Gallinula chloropus</i>			
91			オオバン	<i>Fulica atra</i>		Species requiring attention	
92		Rostratulidae	タマシギ	<i>Rostratula benghalensis</i>	VU	Species requiring attention	
93		Charadriidae	コチドリ	<i>Charadrius dubius</i>			
94			イカルチドリ	<i>Charadrius placidus</i>			
95			シロチドリ	<i>Charadrius alexandrinus</i>	VU		
96			ムナグロ	<i>Pluvialis dominica</i>			
97			ダイゼン	<i>Pluvialis squatarola</i>			
98			ケリ	<i>Microsarcops cinereus</i>	DD	Species requiring attention	
99			タゲリ	<i>Vanellus vanellus</i>			
100		Scolopacidae	トウネン	<i>Calidris ruficollis</i>			
101			ヒバリシギ	<i>Calidris minutilla</i>			
102			オバシギ	<i>Calidris tenuirostris</i>			
103			ミユビシギ	<i>Calidris alba</i>			
104			アカアシシギ	<i>Tringa totanus</i>			
105			オジロトウネン	<i>Calidris temminckii</i>			
106			アメリカウズラシギ	<i>Calidris melanotos</i>			
107			ウズラシギ	<i>Calidris acuminata</i>			
108			ハマシギ	<i>Calidris alpina</i>	NT		
109			サルハマシギ	<i>Calidris ferruginea</i>			
110			エリマキシギ	<i>Philomachus pugnax</i>			
111			キリアイ	<i>Limicola falcinellus</i>			
112			オオハシシギ	<i>Limnodromus scolopeucus</i>			
113			ツルシギ	<i>Tringa erythropus</i>	VU		
114			コアアシシギ	<i>Tringa stagnatilis</i>			
115			コキアシシギ	<i>Tringa flavipes</i>			
116			アアシシギ	<i>Tringa nebularia</i>			
117			クサシギ	<i>Tringa ochropus</i>			
118			タカブシギ	<i>Tringa glareola</i>	VU		
119			キアシシギ	<i>Tringa brevipes</i>			
120			イソシギ	<i>Tringa hypoleucos</i>			
121			ソリハシシギ	<i>Xenus cinereus</i>			
122			オグロシギ	<i>Limosa limosa</i>			
123			オオソリハシシギ	<i>Limosa lapponica</i>	VU		
124			チュウシャクシギ	<i>Numenius phaeopus</i>			
125			ヤマシギ	<i>Scolopax rusticola</i>			
126			アオシギ	<i>Gallinago solitaria</i>			
127			タシギ	<i>Gallinago gallinago</i>			
128			オオジシギ	<i>Gallinago hardwickii</i>	NT	NT	
129		Recurvirostridae	セイタカシギ	<i>Himantopus himantopus</i>	VU		
130		Phalaropodidae	アカエリヒレアシシギ	<i>Phalaropus himantopus</i>			

No.	class	family	species		category in Red List in Japan		Natural Monument (Nationally Designated)	
			Japanese name	scientific name	National(MOE)	Local(Miyagi pref.)		
131		Glareolidae	ツバメチドリ	<i>Glareola maldivarum</i>	VU			
132		Laridae	ユリカモメ	<i>Larus ridibundus</i>				
133			オオセグロカモメ	<i>Larus schistisagus</i>				
134			セグロカモメ	<i>Larus argentatus</i>				
135			カモメ	<i>Larus canus</i>				
136			ウミネコ	<i>Larus crassirostris</i>				
137			ワシカモメ	<i>Larus glaucescens</i>				
138			オニアジサシ	<i>Hydroprogne caspia</i>				
139			アジサシ	<i>Sterna hirundo</i>				
140			ハジロクロハラアジサシ	<i>Sterna leucoptera</i>				
141			クロハラアジサシ	<i>Sterna hybida</i>				
142			コアジサシ	<i>Sterna albifrons</i>	VU	VU		
143			Columbidae	キジバト	<i>Streptopelia orientalis</i>			
144				アオバト	<i>Treron sieboldii</i>			
145		Cuculidae	カッコウ	<i>Cuculus canorus</i>				
146			ジュウイチ	<i>Cuculus fugax</i>				
147			ツツドリ	<i>Cuculus saturatus</i>				
148			ホトトギス	<i>Cuculus poliocephalus</i>				
149		Upupidae	ヤツガシラ	<i>Upupa epops</i>				
150		Strigidae	フクロウ	<i>Strix uralensis</i>				
151			トラフズク	<i>Asio otus</i>				
152			コミミズク	<i>Asio flammeus</i>			Species requiring attention	
153			コノハズク	<i>Otus scops</i>				
154			オオコノハズク	<i>Otus bakkamoena</i>				
155			アオバズク	<i>Ninox scutulata</i>		VU		
156		Caprimulgidae	ヨタカ	<i>Caprimulgus indicus</i>	NT			
157		Apodidae	ハリオアマツバメ	<i>Chaetura caudacuta</i>				
158			アマツバメ	<i>Apus pacificus</i>				
159		Alcedinidae	ヤマセミ	<i>Ceryle lugubris</i>				
160			アカショウビン	<i>Halcyon coromanda</i>				
161			カワセミ	<i>Alcedo atthis</i>				
162		Picidae	アリスイ	<i>Jynx torquilla</i>				
163			コゲラ	<i>Dendrocopos kizuki</i>				
164			オオアカゲラ	<i>Dendrocopos leucotos</i>				
165			アオゲラ	<i>Picus awokera</i>				
166			アカゲラ	<i>Dendrocopos major</i>				
167		Certhiidae	キバシリ	<i>Certhia familiaris</i>				
168		Alaudidae	ヒバリ	<i>Alauda arvensis</i>				
169		Hirundinidae	ショウドウツバメ	<i>Riparia riparia</i>				
170			ツバメ	<i>Hirundo rustris</i>				
171			コシアカツバメ	<i>Hirundo daurica</i>			Species requiring attention	
172			イワツバメ	<i>Delichon urbica</i>				
173		Motacillidae	キセキレイ	<i>Motacilla cinerea</i>				
174			ハクセキレイ	<i>Motacilla alba</i>				
175			セグロセキレイ	<i>Motacilla grandis</i>				
176			ビンズイ	<i>Anthus hodgsoni</i>				
177			タヒバリ	<i>Anthus spinoletta</i>				
178		Campephagidae	サンショウクイ	<i>Pericrocotus divaricatus</i>	VU	VU		
179		Pycnonotidae	ヒヨドリ	<i>Hypsipetes amaurotis</i>				
180		Laniidae	チゴモズ	<i>Lanius tigrinus</i>	CR	CR+EN		
181			モズ	<i>Lanius bucephalus</i>				
182			アカモズ	<i>Lanius cristatus</i>	EN	CR+EN		
183			オオモズ	<i>Lanius sxubitor</i>				
184		Bombycillidae	キレンジャク	<i>Bombycilla garrulus</i>				
185			ヒレンジャク	<i>Bombycilla japonica</i>				
186		Troglodytidae	ミソサザイ	<i>Troglodytes troglodytes</i>				
187		Muscicapidae	コマドリ	<i>Erithacus akahige</i>				
188			オガワコマドリ	<i>Luscinia svecica</i>				
189			コルリ	<i>Luscinia cyane</i>				
190			ノドグロツグミ	<i>Turdus ruficollis</i>				
191			ムギマキ	<i>Ficedula mugimaki</i>				
192			ノゴマ	<i>Erithacus calliope</i>				
193			ルリビタキ	<i>Tarsiger cyanurus</i>				
194			エゾビタキ	<i>Muscicapa griseisticta</i>				
195			サメビタキ	<i>Muscicapa sibirica</i>				
196			コサメビタキ	<i>Muscicapa dauurica</i>				
197			ジョウビタキ	<i>Phoenicurus auroreus</i>				
198			ノビタキ	<i>Saxicola torquata</i>			LP	
199			イソヒヨドリ	<i>Monticola solitarius</i>				
200			マミジロ	<i>Turdus sibiricus</i>				

No.	class	family	species		category in Red List in Japan		Natural Monument (Nationally Designated)
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201			クロツグミ	<i>Turdus cardis</i>			
202			アカハラ	<i>Turdus chrysolaus</i>			
203			シロハラ	<i>Turdus pallidus</i>			
204			マミチャジナイ	<i>Turdus obscurus</i>			
205			ツグミ	<i>Turdus naumanni</i>			
206			ハシグロヒタキ	<i>Oenanthe oenanthe</i>			
207			トラツグミ	<i>Zoothera dauma</i>			
208			ヤブサメ	<i>Urosphena squameiceps</i>			
209			ウグイス	<i>Cettia diphone</i>			
210			シマセンニュウ	<i>Locustella ochotensis</i>			
211			マキノセンニュウ	<i>Locustella lanceolata</i>	NT		
212			コヨシキリ	<i>Acrocephalus bistrigiceps</i>			
213			オオヨシキリ	<i>Acrocephalus arundinaceus</i>			
214			メボソムシクイ	<i>Phylloscopus borealis</i>			
215			エゾムシクイ	<i>Phylloscopus tenellipes</i>			
216			センダイムシクイ	<i>Phylloscopus occipitalis</i>			
217			キクイタダキ	<i>Regulus regulus</i>			
218			セッカ	<i>Cisticola juncidis</i>			
219			オオセッカ	<i>Megalurus pryei</i>	EN	NT	
220			キビタキ	<i>Ficedula narcissina</i>			
221			サンコウチョウ	<i>Terpsiphone atrocaudata</i>			
222			オオルリ	<i>Cyanoptila cyanomelana</i>			
223		Aegithalidae	エナガ	<i>Aegithalos caudatus</i>			
224			コガラ	<i>Parus montanus</i>			
225			ヒガラ	<i>Parus ater</i>			
226			シジュウカラ	<i>Parus major</i>			
227			ヤマガラ	<i>Parus varius</i>			
228		Sittidae	ゴジュウカラ	<i>Sitta europaea</i>			
229		Paridae	メジロ	<i>Zosterops japonica</i>			
230		Cinclidae	カワガラス	<i>Cinclus pallasii</i>			
231		Emberizidae	ホオジロ	<i>Emberiza cioides</i>			
232			コジュリン	<i>Emberiza yessoensis</i>	VU	NT	
233			ホオアカ	<i>Emberiza fucata</i>			
234			コホオアカ	<i>Emberiza pusilla</i>			
235			カシラダカ	<i>Emberiza rustica</i>			
236			ミヤマホオジロ	<i>Emberiza elegans</i>			
237			シマアオジ	<i>Emberiza aureola</i>	CR		
238			ノジコ	<i>Emberiza sulphurata</i>	NT	Species requiring attention	
239			アオジ	<i>Emberiza spodocephala</i>			
240			クロジ	<i>Emberiza variabilis</i>			
241			シベリアジュリン	<i>Emberiza pallasi</i>			
242			オオジュリン	<i>Emberiza schoeniclus</i>			
243			ツメナガホオジロ	<i>Calcarius lapponicus</i>			
244			イワヒバリ	<i>Prunella collaris</i>			
245			カヤクグリ	<i>Prunella rubida</i>			
246			ユキホオジロ	<i>Plectrophenax nivalis</i>			
247			サバンナシトド	<i>Passerculus sandwichensis</i>			
248		Fringillidae	アトリ	<i>Fringilla montifringilla</i>			
249			カワラヒワ	<i>Carduelis sinica</i>			
250			マヒワ	<i>Carduelis spinus</i>			
251			ベニヒワ	<i>Acanthis flammea</i>			
252			ハギマシコ	<i>Leucosticte arctoa</i>			
253			ベニマシコ	<i>Uragus sibiricus</i>			
254			アカマシコ	<i>Carpodacus roseus</i>			
255			オオマシコ	<i>Carpodacus roseus</i>			
256			イスカ	<i>Loxia curvirostra</i>			
257			ギンザンマシコ	<i>Pinicola enucleato</i>			
258			ウソ	<i>Phrrhula pyrrhula</i>			
259			シメ	<i>Coccothraustes coccothraustes</i>			
260			イカル	<i>Eophona personata</i>			
261		Ploceidae	ニューナイスズメ	<i>Passer rutilans</i>			
262			スズメ	<i>Passer montanus</i>			
263		Sturnidae	コムクドリ	<i>Sturnus philippensis</i>			
264			ホシムクドリ	<i>Sturnus vulgaris</i>			
265			ムクドリ	<i>Sturnus cineraceus</i>			
266		Corvidae	カケス	<i>Garrulus glandarius</i>			
267			オナガ	<i>Cyanopica cyana</i>			
268			ホシガラス	<i>Nucifraga caryocatactes</i>			
269			コクマルガラス	<i>Corvus nonedula</i>			
270			ミヤマガラス	<i>Corvus frugilegus</i>			
271			ハシボソガラス	<i>Corvus corone</i>			



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272			ハシブトガラス	<i>Corvus macrorhynchos</i>			

Sources:

"Wild Animals and Plants of Miyagi Prefecture in Danger of Extinction—Red Data Book Miyagi" (Nature Conservation Division, Environmental and Community Affairs Department, Miyagi Prefecture, 2016)

"Distribution of Bird Species of Miyagi Prefecture" (Wild Bird Society of Japan, Miyagi Prefecture Branch, 2002)

"National Survey on the Natural Environment, Animal and Plant Distribution Survey (2nd survey) National Environmental Survey Web-GIS"

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"6th National Survey on the National Environment, Survey of Species Diversity, Report on Survey of Reproductive Distribution of Bird Species" (Ministry of the Environment, 2004)

"Biodiversity Information System—Habitat Survey of Anatidae 2005–2014"

Assessment Record" (Miyagi Prefectural Eai River Erosion Control Works Office, 1990)

"Environmental Impact Assessment Record for Naruse River Comprehensive Development Project (Tsutsusago Dam)" (Miyagi Prefectural Naruse River Comprehensive Development Construction Office, 1993)

"National Census on River Environments (River Edition) Kitakami River, Downstream, 1997, 2003 Surveys"

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"National Census on River Environments (Dams and Lakes Edition) Naruko Dam, 1994, 1999, 2000, 2005 Surveys"

"Results of a Monitoring Survey of Kabukuri Marsh and Surrounding Rice Fields (Eastern Miyagi Prefecture Civil Engineering Office, Tome Regional Office) 2004–2011"

"Kejo Marsh Ramsar Convention Wetland Conservation Action Plan (Osaki City, Miyagi Prefecture) 2008–2011"

### 3. Species and Numbers of the Principal Migratory Birds which Fly into the Osaki Area

Genus	Species	Ministry of the Environment RD Conservation status	Number of birds in Kabukurinuma/Kejonuma	Number of birds nationwide
<i>Anser</i>	Greater White-fronted Goose	Near Threatened	85,240	190,503
	Lesser White-fronted Goose	Endangered	0	4
	(*In a survey by a local NPO, carried out separately from this survey, around 60 birds are identified each year.)			
	Thick-billed Bean Goose <i>Anser fabalis serrirostris</i>	Vulnerable	1,287	20,491 (No distinction between the two subspecies)
Middendorf's Bean Goose <i>Anser fabalis middendorffii</i>	Near Threatened	850		
<i>Branta</i>	Aleutian Cackling Goose <i>Branta hutchinsii leucopareia</i>	Critically Endangered	450	529
<i>Cygnus</i>	Whooper Swan	—	3,381	32,161
	Tundra Swan	—	1,836	37,154

Data Sources: the Greater White-fronted Goose, the Joint Survey of Greater White-fronted Goose in main habitats organized by T. Shimada (February 3, 2016)

Other species, 45<sup>th</sup> National Waterfowl Survey by Ministry of the Environment, Japan (January 16, 2014).  
on by MOE

#### 4. Agricultural Diversity List

Classification	Item	Variety Name	In Japanese	Scientific Name
Rice crop	Nonglutinous rice	Sasanishiki	ササニシキ	<i>Oryza sativa</i>
		Hitomebore	ひとめぼれ	<i>Oryza sativa</i>
		Manamusume	まなむすめ	<i>Oryza sativa</i>
		Tohoku194	東北 194 号 (ささ結、ささゆた香)	<i>Oryza sativa</i>
		Akitakomachi	あきたこまち	<i>Oryza sativa</i>
		Tsuyahime	つや姫	<i>Oryza sativa</i>
		Toyonishiki	トヨニシキ	<i>Oryza sativa</i>
		Genkimaru	げんきまる	<i>Oryza sativa</i>
		Yamanoshizuku	やまのしずく	<i>Oryza sativa</i>
		Koshihikari	こしひかり	<i>Oryza sativa</i>
		Yukimusubi	ゆきむすび	<i>Oryza sativa</i>
	Takitate	たきたて	<i>Oryza sativa</i>	
	Rice for brew	Kuranohana	蔵の華	<i>Oryza sativa</i>
		Miyamanishiki	美山錦	<i>Oryza sativa</i>
		Aikoku	愛国	<i>Oryza sativa</i>
		Toyonishiki	トヨニシキ	<i>Oryza sativa</i>
		Hiyori	ひより	<i>Oryza sativa</i>
		Yamadanishiki	山田錦	<i>Oryza sativa</i>
		Yamanoshizuku	やまのしずく	<i>Oryza sativa</i>
	Rice for forage	Fukuhibiki	ふくひびき	<i>Oryza sativa</i>
	Glutinous rice	Miyakoganemochi	みやこがねもち	<i>Oryza sativa</i>
		Himenomochi	ヒメノモチ	<i>Oryza sativa</i>
Mochimusume		もちむすめ	<i>Oryza sativa</i>	
Colored grain rice	Red rice	黒米	<i>Oryza sativa</i>	
	Black rice	赤米	<i>Oryza sativa</i>	
Berley	Wheat	Shiranekomugi	シラネコムギ	<i>Triticum aestivum</i>
		Nanbukomugi	ナンブコムギ	<i>Triticum aestivum</i>
		Yukichikara	ゆきちから	<i>Triticum aestivum</i>
		Aobanokoi	あおばの恋	<i>Triticum aestivum</i>
	Barley	Minorimugi	ミノリムギ	<i>Hordeum vulgare</i>
		Shunrai	シュンライ	<i>Hordeum vulgare</i>
Grain	Buckwheat	Mogamiwase	最上早生	<i>Fagopyrum esculentum</i>
		Hashikamiwase	階上早生	<i>Fagopyrum esculentum</i>
	Corn	Caroline	カロライン	<i>Zea mays</i>

Classification	Item	Variety Name	In Japanese	Scientific Name
		Gold rush	ゴールドラッシュ	<i>Zea mays</i>
Legumious	Soybean	Miyagishirome	ミヤギシロメ	<i>Glycine max</i>
		Tanrei	タンレイ	<i>Glycine max</i>
		Kinusayaka	きぬさやか	<i>Glycine max</i>
		Ayakogane	あやこがね	<i>Glycine max</i>
		Suzuhonoka	すずほのか	<i>Glycine max</i>
Leaf stalk vegetable	Cabbage	YR tenku	YR 天空	<i>Brassica oleracea</i> var. <i>capitata</i> .
		Okina	おきな	<i>Brassica oleracea</i> var. <i>capitata</i>
		Speed bowl2	スピードボール 2号	<i>Brassica oleracea</i> var. <i>capitata</i>
		FuyutoriB	冬獲B号	<i>Brassica oleracea</i> var. <i>capitata</i>
		Purple cabbage	紫キャベツ	<i>Brassica oleracea</i> var. <i>capitata</i>
	Brussels sp.roots	Wasekomochi	早生子持	<i>Brassica oleracea</i>
	Chinese cabbage	Daifuku	大福	<i>Brassica rapa</i> var. <i>glabra</i>
		Menkoi	めんこい	<i>Brassica rapa</i> var. <i>glabra</i>
	Sp.inach	Asagiri	朝霧	<i>Sp.inacia oleracea</i>
		Baltic7	バルチック 7	<i>Sp.inacia oleracea</i>
		Summer victory	サマービクトリー	<i>Sp.inacia oleracea</i>
		Super tonic	スーパートニック	<i>Sp.inacia oleracea</i>
		Salad sp.inach	サラダほうれん草	<i>Sp.inacia oleracea</i>
	Greens for pickling	Komatsuna	小松菜	<i>Brassica rapa</i> var. <i>perviridis</i>
		Kahokuna	河北菜	<i>Brassica rapa</i> var. <i>perviridis</i>
		Nozawana	野沢菜	<i>Brassica rapa</i> var. <i>perviridis</i>
		Bitamina	ビタミン菜	<i>Brassica rapa</i> var. <i>perviridis</i>
		Chizimina	ちぢみ菜	<i>Brassica rapa</i> var. <i>perviridis</i>
		Benrina	ベンリ菜	<i>Brassica rapa</i> var. <i>perviridis</i>
		Chirimenna	ちりめん菜	<i>Brassica rapa</i> var. <i>perviridis</i>
		Kakina	かき菜	<i>Brassica rapa</i> var. <i>perviridis</i>
		Takana	高菜	<i>Brassica rapa</i> var. <i>perviridis</i>
		Seina	青菜	<i>Brassica rapa</i> var. <i>perviridis</i>
		Tsumina	つみ菜	<i>Brassica rapa</i> var. <i>perviridis</i>
	Qing geng cai	Qing geng cai	青梗菜	<i>Brassica rapa</i> var. <i>chinensis</i>
		Mini qing geng cai	ミニチンゲンサイ	<i>Brassica rapa</i> var. <i>chinensis</i>
		Yukina	ゆき菜	<i>Brassica rapa</i> var. <i>chinensis</i>
		Tasai	ターサイ	<i>Brassica rapa</i> var. <i>chinensis</i>
	Potherb Mustard	Kyona	京菜	<i>Brassica rapa</i> var. <i>nipposinica</i>

Classification	Item	Variety Name	In Japanese	Scientific Name
		Kyomizore	京みぞれ	<i>Brassica rapa</i> var. <i>nipposinica</i>
	Mibuna	Mibuna	みぶな	<i>Brassica rapa</i> var. <i>nipposinica</i>
	Mustard greens	Karasina	からし菜	<i>Brassica juncea</i>
		Wasabina	わさび菜	<i>Brassica juncea</i>
	Petit vert	Petit vert	プチベール	<i>Brassica oleracea</i> cultivar
	Lettuce	Ball lettuce	玉レタス	<i>Lactuca sativa</i> var. <i>crispa</i>
		Red leaf lettuce	サニーレタス	<i>Lactuca sativa</i> var. <i>crispa</i>
		Yamakurage	山くらげ	<i>Lactuca sativa</i> var. <i>crispa</i>
		Semi-head lettuce	半結球レタス	<i>Lactuca sativa</i> var. <i>crispa</i>
		Saladana	サラダ菜	<i>Lactuca sativa</i> var. <i>crispa</i>
		Leaf lettuce	リーフレタス	<i>Lactuca sativa</i> var. <i>crispa</i>
		Celtuce	サンチュ	<i>Lactuca sativa</i> var. <i>crispa</i>
	Swamp cabbage	Swamp cabbage	空芯菜	<i>Ipomoea aquatica</i>
		Pariparinatsuna	パリパリ夏菜	<i>Ipomoea aquatica</i>
	Crown daisy	Obasyungiku	大葉春菊	<i>Chrysanthemum coronarium</i>
		Nabebugyo	なべ奉行	<i>Chrysanthemum coronarium</i>
		Kikuzo	菊蔵	<i>Chrysanthemum coronarium</i>
		Stick crown daisy	スティック春菊	<i>Chrysanthemum coronarium</i>
	Oriental garlic	Powerful greenbelt	パワフルグリーンベルト	<i>Allium tuberosum</i>
		Wonder greenbelt	ワンダーグリーンベルト	<i>Allium tuberosum</i>
		Thunder greenbelt	サンダーグリーンベルト	<i>Allium tuberosum</i>
		Greenroad	グリーンロード	<i>Allium tuberosum</i>
		Kainan	海南	<i>Allium tuberosum</i>
		Dairen	大連	<i>Allium tuberosum</i>
		Niranome	ニラの芽	<i>Allium tuberosum</i>
	Perilla	Green perilla	青シソ	<i>Perilla frutescens</i> var. <i>crispa</i>
		Red perilla	赤シソ	<i>Perilla frutescens</i> var. <i>crispa</i>
		Fruit of Perilla	シソの実	<i>Perilla frutescens</i> var. <i>crispa</i>
		Egoma	えごま (じゅうねん)	<i>Perilla frutescens</i> var. <i>crispa</i>
	Japanese honeywort	Mitsuba	ミツバ	<i>Cryptotaenia japonica</i>
		Hanawasabi	花わさび	<i>Cryptotaenia japonica</i>
	Nalta jute		モロヘイヤ	<i>Corchorus olitorius</i>
	Indian sp.inach	Tsurumurasaki	つるむらさき	<i>Basella alba</i>
		Tsuruna	つるな	<i>Basella alba</i>
	Orange Daylily	Nokanzou	野萱草	<i>Hemerocallis fulva</i>
	Watercress	Watercress	クレソン	<i>Nasturtium officinale</i>

Classification	Item	Variety Name	In Japanese	Scientific Name	
	Water dropwort	Water dropwort	せり	<i>Oenanthe javanica</i>	
		Matsuyama water dropwort	松山セリ		
	celery	celery	セロリ	<i>Apium graveolens</i>	
	Onion	Onion	玉ねぎ	<i>Allium cepa</i>	
		Red onion	赤玉ねぎ	<i>Allium cepa</i>	
		Leaf onion	葉玉ねぎ	<i>Allium cepa</i>	
	Welsh onion	White star	ホワイトスター	<i>Allium fistulosum</i>	
		White summer	ホワイトサマー	<i>Allium fistulosum</i>	
		Shirotae	白妙	<i>Allium fistulosum</i>	
		Shiraya	白矢	<i>Allium fistulosum</i>	
		White tiger	ホワイトタイガー	<i>Allium fistulosum</i>	
		Shirabayashi	白林	<i>Allium fistulosum</i>	
			Huyuo2	冬扇 2 号	<i>Allium fistulosum</i>
			Natsuo4	夏扇 4 号	<i>Allium fistulosum</i>
Syuitsu			秀逸	<i>Allium fistulosum</i>	
Choho			長宝	<i>Allium fistulosum</i>	
Motokura			元蔵	<i>Allium fistulosum</i>	
Asatsuki			あさつき	<i>Allium fistulosum</i>	
Bannonegi			万能ねぎ	<i>Allium fistulosum</i>	
Asparagus		Asparagus	アスパラガス	<i>Asparagus</i> spp.	
Garlic		Garlic	ニンニク	<i>Allium sativum</i>	
		Niranome	ニラの芽	<i>Allium sativum</i>	
		Alpine leek	行者にんにく	<i>Allium sativum</i>	
Turnip rape		Kosaitai	紅葉苔	<i>Brassica chinensis</i> f. <i>honsaitai</i>	
		Harutachina	春立ち菜	<i>Brassica chinensis</i> f. <i>honsaitai</i>	
		Asuparana	アスパラ菜	<i>Brassica chinensis</i> f. <i>honsaitai</i>	
		Santona	サント菜	<i>Brassica chinensis</i> f. <i>honsaitai</i>	
		Herana	ヘラ菜	<i>Brassica chinensis</i> f. <i>honsaitai</i>	
		Sanrikutsubomina	三陸つぼみ菜	<i>Brassica chinensis</i> f. <i>honsaitai</i>	
		Nabana	菜花	<i>Brassica chinensis</i> f. <i>honsaitai</i>	
		Norin20	農林 20 号	<i>Brassica chinensis</i> f. <i>honsaitai</i>	
Kizakinonatane		キザキの菜種	<i>Brassica chinensis</i> f. <i>honsaitai</i>		
Parsley		Parsley	パセリ	<i>Petroselinum crispum</i>	
Curled mallow		Okanori	おかのり	<i>Malva verticillata</i>	
Common ice plant		Common ice plant	アイスプラント	<i>Mesembryanthemum crystallinum</i>	

Classification	Item	Variety Name	In Japanese	Scientific Name
Flower vegetable	Cauliflower	Cauliflower	カリフラワー	<i>Brassica oleracea</i> var. <i>botrytis</i>
	Broccoli	Pixel	ピクセル	<i>Brassica oleracea</i> var. <i>italica</i>
		Subaru	すばる	<i>Brassica oleracea</i> var. <i>italica</i>
		Fighter	ファイター	<i>Brassica oleracea</i> var. <i>italica</i>
		Forest	フォレスト	<i>Brassica oleracea</i> var. <i>italica</i>
		Stik broccoli	スティックブロッコリー	<i>Brassica oleracea</i> var. <i>italica</i>
	Myoga	Myoga	みょうが	<i>Zingiber mioga</i>
	Florists' daisy	Shokuyogiku	食用菊	<i>Chrysanthemum</i> × <i>morifolium</i> syn
Fruit and Vegetable	Strawberry	Tochiotome	とちおとめ	<i>Fragaria</i> × <i>ananassa</i>
		Mouikko	もういっこ	<i>Fragaria</i> × <i>ananassa</i>
		Tokun	桃薫	<i>Fragaria</i> × <i>ananassa</i>
	Cucurbitaceae	Bitter melon	ニガウリ	<i>Cucurbitaceae</i> Juss
		Winter melon	冬瓜	<i>Cucurbitaceae</i> Juss
		Chayote	ハヤトウリ	<i>Cucurbitaceae</i> Juss
	Melon	Andes	アンデス	<i>Cucumis melo</i>
		Prince	プリンス	<i>Cucumis melo</i>
		Nihonichi	日本一	<i>Cucumis melo</i>
		Mini melon	ミニメロン	<i>Cucumis melo</i>
	Oriental Melon	Kanromakuwa	甘露まくわ	<i>Cucumis melo</i> var. <i>makuwa</i>
		Ginkaku	銀閣	<i>Cucumis melo</i> var. <i>makuwa</i>
	Watermelon	Benikagura	紅神楽	<i>Citrullus lanatus</i>
		Paisley	ペイズリー	<i>Citrullus lanatus</i>
		Gosp.el	ゴスペル	<i>Citrullus lanatus</i>
		Aihime	あい姫	<i>Citrullus lanatus</i>
		Benikodama	紅こだま	<i>Citrullus lanatus</i>
		Yellow hikarikodama	黄ひかりこだま	<i>Citrullus lanatus</i>
	Cucumber	Excellent essey353	エクセレント節成353号	<i>Cucumis sativus</i>
		Excellent620	エクセレント620	<i>Cucumis sativus</i>
		Subaru	すばる	<i>Cucumis sativus</i>
		Status summer3	ステータス夏3	<i>Cucumis sativus</i>
		KahoEX	香峰EX	<i>Cucumis sativus</i>
V summer		Vサマー	<i>Cucumis sativus</i>	
Shisen		四川	<i>Cucumis sativus</i>	
Shisen2		四川2号	<i>Cucumis sativus</i>	

Classification	Item	Variety Name	In Japanese	Scientific Name
		Nankyoku 1	南極 1 号	<i>Cucumis sativus</i>
		Natsugenki	夏元気	<i>Cucumis sativus</i>
		Bihaku	美白	<i>Cucumis sativus</i>
		Kotobuki	ことぶき	<i>Cucumis sativus</i>
		Yumi637	ゆうみ 637	<i>Cucumis sativus</i>
		Sensyu2	千秀 2 号	<i>Cucumis sativus</i>
		Kojin1	光神 1 号	<i>Cucumis sativus</i>
		Kojin2	光神 2 号	<i>Cucumis sativus</i>
		Magical1	マジカル 1 号	<i>Cucumis sativus</i>
		Tokiwa888	ときわ 888	<i>Cucumis sativus</i>
	Pumpkin	kuriaji	栗あじ	<i>Cucurbita moschata</i>
		Dark horse	ダークホース	<i>Cucurbita moschata</i>
		Nagachan	ながちゃん	<i>Cucurbita moschata</i>
		Hakusyaku	伯爵	<i>Cucurbita moschata</i>
		Naguri	名栗	<i>Cucurbita moschata</i>
		Kuriebisu	栗えびす	<i>Cucurbita moschata</i>
		Miyako	みやこ	<i>Cucurbita moschata</i>
		Pucchini	ブッチーニ	<i>Cucurbita moschata</i>
		Bocchan	坊ちゃん	<i>Cucurbita moschata</i>
		Hottokekuritan	ほっとけ栗たん	<i>Cucurbita moschata</i>
		Meruhén	メルヘン	<i>Cucurbita moschata</i>
		Roron	ロロン	<i>Cucurbita moschata</i>
		Mini pumpkin	ミニかぼちゃ	<i>Cucurbita moschata</i>
		Nakatama pumpkin	中玉かぼちゃ	<i>Cucurbita moschata</i>
		Totteoki	とっておき	<i>Cucurbita moschata</i>
		Korinki	コリンキー	<i>Cucurbita moschata</i>
		Kanryu	甘龍	<i>Cucurbita moschata</i>
		Somen pumpkin	そうめんかぼちゃ	<i>Cucurbita moschata</i>
	Zucchini	ズッキーニ	<i>Cucurbita moschata</i>	
	Piment	Kyoyutaka	京ゆたか	<i>Capsicum annuum</i> var. <i>grossum</i>
		Banana piment	バナナピーマン	<i>Capsicum annuum</i> var. <i>grossum</i>
	Paprika	Special(Red)	スペシャル(赤)	<i>Capsicum annuum</i> 'grossum'
		Fairway(Yellow)	フェアウェイ (黄)	<i>Capsicum annuum</i> 'grossum'
		Furupi redEX	フルーピーレッド EX	<i>Capsicum annuum</i> 'grossum'
Furupi Yellow		フルーピーイエロー	<i>Capsicum annuum</i> 'grossum'	



Classification	Item	Variety Name	In Japanese	Scientific Name
	Sweetpepper	Aoisito	葵ししとう	<i>Capsicum annuum</i> var. <i>grossum</i>
		Amatobijin	甘とう美人	<i>Capsicum annuum</i> var. <i>grossum</i>
		Tsubaki green	つばきグリーン	<i>Capsicum annuum</i> var. <i>grossum</i>
		Nikkoonaga	日光大長	<i>Capsicum annuum</i> var. <i>grossum</i>
		Umakara	うまから	<i>Capsicum annuum</i> var. <i>grossum</i>
	Chile papper	Takanotsume	鷹の爪	<i>Capsicum annuum</i>
		Gekikara	げきから	<i>Capsicum annuum</i>
	Eggplant	Naganasu	長ナス	<i>Solanum melongena</i>
		Syoyadainaganasu	庄屋大長ナス	<i>Solanum melongena</i>
		Beinasu	米ナス	<i>Solanum melongena</i>
		Binan	美男	<i>Solanum melongena</i>
		Kurobe	くろべえ	<i>Solanum melongena</i>
		Shinsentyunaganasu	真仙中長なす	<i>Solanum melongena</i>
		Sendainaganasu	仙台長なす	<i>Solanum melongena</i>
		Shikon senndainaganasu	紫紺仙台長なす	<i>Solanum melongena</i>
		Shikibu	式部	<i>Solanum melongena</i>
		Senryo	千両	<i>Solanum melongena</i>
		Anominori	あのみどり	<i>Solanum melongena</i>
		Chikuyo	筑陽	<i>Solanum melongena</i>
		Kokuyo	黒陽	<i>Solanum melongena</i>
		Shinsen	真仙	<i>Solanum melongena</i>
		Kogoro	小五郎	<i>Solanum melongena</i>
	Kurowashi	くろわし	<i>Solanum melongena</i>	
	Green soybeans	Aomorimidori	青森みどり	<i>Glycine max</i>
		Kuromame	黒豆	<i>Glycine max</i>
		Sakenotomo	酒の友	<i>Glycine max</i>
		Chamame	茶豆	<i>Glycine max</i>
		Hayaiccha	はやいっ茶	<i>Glycine max</i>
		Ichibancha	イチバン茶	<i>Glycine max</i>
		Echigo honey	越後ハニー	<i>Glycine max</i>
		Hiden	秘伝	<i>Glycine max</i>
Yuagarimusume		湯上り娘	<i>Glycine max</i>	
Podded pea	Kinusayaendo	絹さやエンドウ	<i>Pisum sativum</i>	
	Snap pea	スナップエンドウ	<i>Pisum sativum</i>	

Classification	Item	Variety Name	In Japanese	Scientific Name	
		Sasage	ササゲ	<i>Pisum sativum</i>	
	Common bean	Super stayer	スーパーステイヤー	<i>Phaseolus vulgaris</i>	
		Romano	ロマノ	<i>Phaseolus vulgaris</i>	
		Morocco	モロッコ	<i>Phaseolus vulgaris</i>	
		Satsukimidori	さつきみどり	<i>Phaseolus vulgaris</i>	
	Okra	Gokaku okra	五角オクラ	<i>Abelmoschus esculentus</i>	
	Tomato	Delicious junior	デリシャスジュニア	<i>Solanum lycopersicum</i>	
		Delicious tomato	デリシャストマト	<i>Solanum lycopersicum</i>	
		Rinca409	りんか409	<i>Solanum lycopersicum</i>	
		Hukken	福建	<i>Solanum lycopersicum</i>	
		Momotaro gurande	桃太郎グランデ	<i>Solanum lycopersicum</i>	
		Momotaro	桃太郎	<i>Solanum lycopersicum</i>	
		Momotaro gift	桃太郎ギフト	<i>Solanum lycopersicum</i>	
		Momotaro sanny	桃太郎サニー	<i>Solanum lycopersicum</i>	
		House momotaro	ハウス桃太郎	<i>Solanum lycopersicum</i>	
		CF house Momotaro	CF ハウス桃太郎	<i>Solanum lycopersicum</i>	
		CF momotaro Haruka	CF 桃太郎はるか	<i>Solanum lycopersicum</i>	
		Momotaro select	桃太郎セレクト	<i>Solanum lycopersicum</i>	
		Momotaro gold	桃太郎ゴールド	<i>Solanum lycopersicum</i>	
		Yubi	優美	<i>Solanum lycopersicum</i>	
		Reika	麗夏	<i>Solanum lycopersicum</i>	
		Red olle	レッドオーレ	<i>Solanum lycopersicum</i>	
		Orange olle	オレンジオーレ	<i>Solanum lycopersicum</i>	
		Shindy sweet	シンディースイート	<i>Solanum lycopersicum</i>	
		Mini tomato	Mini tomato	ミニトマト	<i>Lycopersicon esculentum</i>
			Aiko	アイコ	<i>Lycopersicon esculentum</i>
	Yellow aiko		イエローアイコ	<i>Lycopersicon esculentum</i>	
	Chika		千果	<i>Lycopersicon esculentum</i>	
	Sweet ruby		スイートルビー	<i>Lycopersicon esculentum</i>	
	Komomo		小桃	<i>Lycopersicon esculentum</i>	
	Pinky		ピンキー	<i>Lycopersicon esculentum</i>	
	Mr.Asano no kessaku		Mr. 浅野のけっさく	<i>Lycopersicon esculentum</i>	
	Petit puyo		プチぶよ	<i>Lycopersicon esculentum</i>	
	Orange paruche		オレンジバルチェ	<i>Lycopersicon esculentum</i>	
Root crop	Edible burdock	Edible burdock	ごぼう	<i>Arctium lappa</i>	

Classification	Item	Variety Name	In Japanese	Scientific Name
		Takagi burdock	高城ごぼう	<i>Arctium lappa</i>
	Carrot	Carrot	にんじん	<i>Daucus carota</i> subsp. <i>sativus</i>
	Japaneseradish	Natsunotsubasa	夏のつばさ	<i>Raphanus sativus</i>
		Natsutsukasa	夏つかさ	<i>Raphanus sativus</i>
		YR kurama	Y R くらま	<i>Raphanus sativus</i>
		Kenka37	猷夏 37	<i>Raphanus sativus</i>
		Hatsukadaikon	二十日大根	<i>Raphanus sativus</i>
		Wakamiya2	若宮 2 号	<i>Raphanus sativus</i>
		Wasabidaikon	わさび大根	<i>Raphanus sativus</i>
		Hadaikon	葉大根	<i>Raphanus sativus</i>
		Kozena	小瀬菜	<i>Raphanus sativus</i>
	Turnip	Turnip	カブ	<i>Brassica rapa</i> var. <i>rapa</i>
		Small turnip	小カブ	<i>Brassica rapa</i> var. <i>rapa</i>
		Large turnip	大カブ	<i>Brassica rapa</i> var. <i>rapa</i>
		Red turnip	赤カブ	<i>Brassica rapa</i> var. <i>rapa</i>
		White turnip	白カブ	<i>Brassica rapa</i> var. <i>rapa</i>
		Suzuna	すずな	<i>Brassica rapa</i> var. <i>rapa</i>
Ginger	Ginger	生姜	<i>Zingiber officinale</i>	
Lotus	Lotus	蓮根	<i>Nelumbo nucifera</i>	
Rakkyo	Rakkyo	らっきょう	<i>Allium chinense</i>	
Potato	Potato	Potato	ジャガイモ	<i>Solanum tuberosum</i>
		Kita akari	北あかり	<i>Solanum tuberosum</i>
		Dansyaku	男爵	<i>Solanum tuberosum</i>
		Toya	とうや	<i>Solanum tuberosum</i>
		May Queen	メイクイン	<i>Solanum tuberosum</i>
	Sweet potato	Sweet potato	さつまいも	<i>Ipomoea batatas</i>
	Eddoe	Eddoe	さといも	<i>Colocasia esculenta</i> Schott
		Kamiibanoimo	上伊場のいも	<i>Colocasia esculenta</i> Schott
	Japanese yam	Zinenjo	自然薯	<i>Dioscorea japonica</i>
		Mukago	むかご	<i>Dioscorea japonica</i>
	Chinese yam	Chinese yam	長芋	<i>Dioscorea polystachya</i>
	Yacon	Yacon	ヤーコン	<i>Smallanthus sonchifolius</i>
	Jerusalem artichoke	Jarusalem artichoke	きくいも	<i>Heliantus tuberosus</i>
Edible wild plant	Edible wild plants	Plantain lily	うるい	<i>Hosta plantaginea</i> (Lam.) Asch
		Saltwort	おかひじき	<i>Salsola komarovii</i> Iljin

Classification	Item	Variety Name	In Japanese	Scientific Name
		Ostrich fem	こごみ	<i>Matteuccia struthiopteris</i>
		Koshiabura	コシアブラ	<i>Eleutherococcus sciadophylloides</i>
		Sawaseri	沢せり	<i>Sium suave</i> subsp. <i>nipponicum</i>
		Shidoke	しどけ	<i>Parasenecio delphinifolius</i>
		Sobana	そば菜	<i>Adenophora remotiflora</i>
		Bamboo shoot	タケノコ	<i>Phyllostachys pubescens</i>
		Taranome	タラの芽	<i>Aralia elata</i>
		Fuki	フキ	<i>Petasites japonicus</i> (Siebold et Zucc.) Maxim.
		Fukinotou	フキノトウ	<i>Petasites japonica</i> Miq
		Mizu	みず	<i>Elatostema umbellatum</i> var. <i>majus</i>
		Yamaudo	山ウド	<i>Aralia cordata</i>
		Yomogi	よもぎ	<i>Artemisia indica</i> var. <i>maximowiczii</i>
		Warabi	わらび	<i>Pteridium aquilinum</i>
Mushroom	Mushroom	Shiitake	しいたけ	<i>Lentinula edodes</i>
		Shimeji	しめじ	<i>Hypsizygus marmoreus</i>
		Nama kikurage	生きくらげ	<i>Auricularia auricula-judae</i>
		Nameko	なめこ	<i>Pholiota microspora</i>
		Hiratake	ひらたけ	<i>Pleurotus ostreatus</i>
		Sheep's head	舞茸	<i>Grifola frondosa</i> Fries.
		Makomodake	マコモダケ	<i>Zizania latifolia</i>
Fruit tree		Passion fruit	パッションフルーツ	<i>Passiflora edulis</i> Sims
		Akwbi	あけび	<i>Akebia quinata</i>
		Fig tree	イチジク	<i>Ficus carica</i>
		Japanese apricot	梅	<i>Prunus mume</i>
		Shibugaki	渋柿	<i>Diospyros kaki</i> Thunberg
		Amagaki	甘柿	<i>Diospyros kaki</i> Thunberg
		kiwifruit	キウイフルーツ	<i>Actinidia deliciosa</i>
		Japanese chestnut	栗	<i>Castanea crenata</i>
		Black walnut	くるみ	<i>Juglans</i> spp.
		Japanese plum	すもも	<i>Prunus salicina</i>
		Pawpaw	ポポー	<i>Asimina triloba</i>
		Peach	桃	<i>Amygdalus persica</i>
		Apple	りんご	<i>Malus pumila</i>
	Grape	Vitis spp.	巨峰	<i>Vitis</i> spp.
		Aki queen	安芸クイーン	<i>Vitis</i> spp.
Kaiji		甲斐路	<i>Vitis</i> spp.	

Classification	Item	Variety Name	In Japanese	Scientific Name
		Tensyu	天秀	<i>Vitis</i> spp.
		Naiagara	ナイアガラ	<i>Vitis</i> spp.
		Fujiminori	藤稔	<i>Vitis</i> spp.
		Benizu	紅伊豆	<i>Vitis</i> spp.
		Muscat	マスカット	<i>Vitis</i> spp.
	Blueberry	Rabbit eye	ラビットアイ	<i>Vaccinium corymbosum</i>
		Huckle berry	ハックルベリー	<i>Vaccinium corymbosum</i>
Other vegetable	Herb	thyme	タイム	<i>Thymus</i> spp.

Sources: Sales lists of agricultural produce from agricultural cooperative associations and direct sales stores within the area, etc.

## 5. The Traditional and Ingenious, Multi-layered Water Management System of Osaki Kōdo

### ① Mountainous area securing irrigation water and using “nurume-suiro”



#### > Characteristics

- Because of the difficulty in securing irrigation water, tunnels have been maintained and managed in a cautious manner.
- Damage caused by cold temperatures is more likely to occur and natural conditions are severe for paddy agriculture.

#### > Knowledge of adaptation

- Excavated **tunnels** (such as the Minamihara-Anazeki tunnel) and **irrigated rice paddies** in mountainous area
- By **installing channels** to **surround rice paddies**, **cold irrigation water is prevented** from directly entering the rice paddies. In particular, use one block of rice paddy with lukewarm water in cold mountainous areas.

### Secure water for irrigation in the mountainous area and measures against low-temperature irrigation

#### [Minamihara-Anazeki tunnel]

- Excavation: 1644-1647 Excavated by **Yusa Heizaemon**
- Total length: 1,880 m (tunnel part 1,331 m) **Water irrigating rice paddies (25 ha) in the Minamihara area**
- Water management system **supporting foods and the livelihoods of farmers in the mountainous area**



### ② Gently inclined area with a naturally flowing water channel network



#### > Characteristics

- Provides water in basins with naturally flowing channels through water intake from rivers
- Necessary to adjust irrigation water in the area as a whole (particularly at times of drought)

#### > Knowledge of adaptation

Take over two types (**drought-time type** and **usual-time type**) of “**bansui**” (block rotation) through agreement of communities and secure irrigation water necessary for the agriculture of the entire region

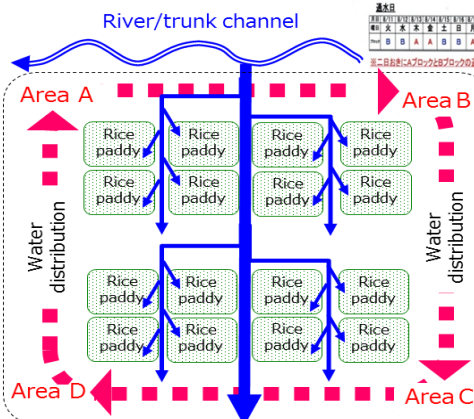
### Bansui at gently inclined area

#### [Drought-time bansui: large area]

Distribute water **by rotation in the entire region** based on the bansui table

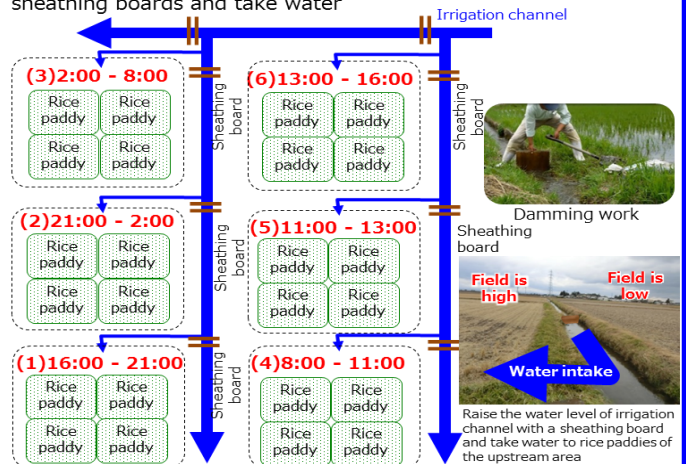
#### Bansui schedule (daily bansui)

Area	Water Intake	Water Distribution
A	16:00-21:00	16:00-21:00
B	8:00-11:00	8:00-11:00
C	2:00-8:00	2:00-8:00
D	11:00-13:00	11:00-13:00
A	13:00-16:00	13:00-16:00
B	21:00-2:00	21:00-2:00
C	11:00-13:00	11:00-13:00
D	8:00-11:00	8:00-11:00
A	16:00-21:00	16:00-21:00
B	8:00-11:00	8:00-11:00
C	2:00-8:00	2:00-8:00
D	11:00-13:00	11:00-13:00
A	13:00-16:00	13:00-16:00
B	21:00-2:00	21:00-2:00
C	11:00-13:00	11:00-13:00
D	8:00-11:00	8:00-11:00

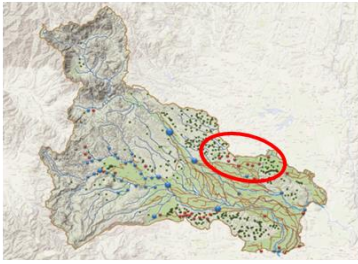


#### [Usual-time bansui: small area]

- Divide irrigation water use time of day into **6 areas** and distribute water at different times
- To rice paddies with height difference, raise water level with sheathing boards and take water



### ③ Wetland area using tunnels for both irrigation and drainage

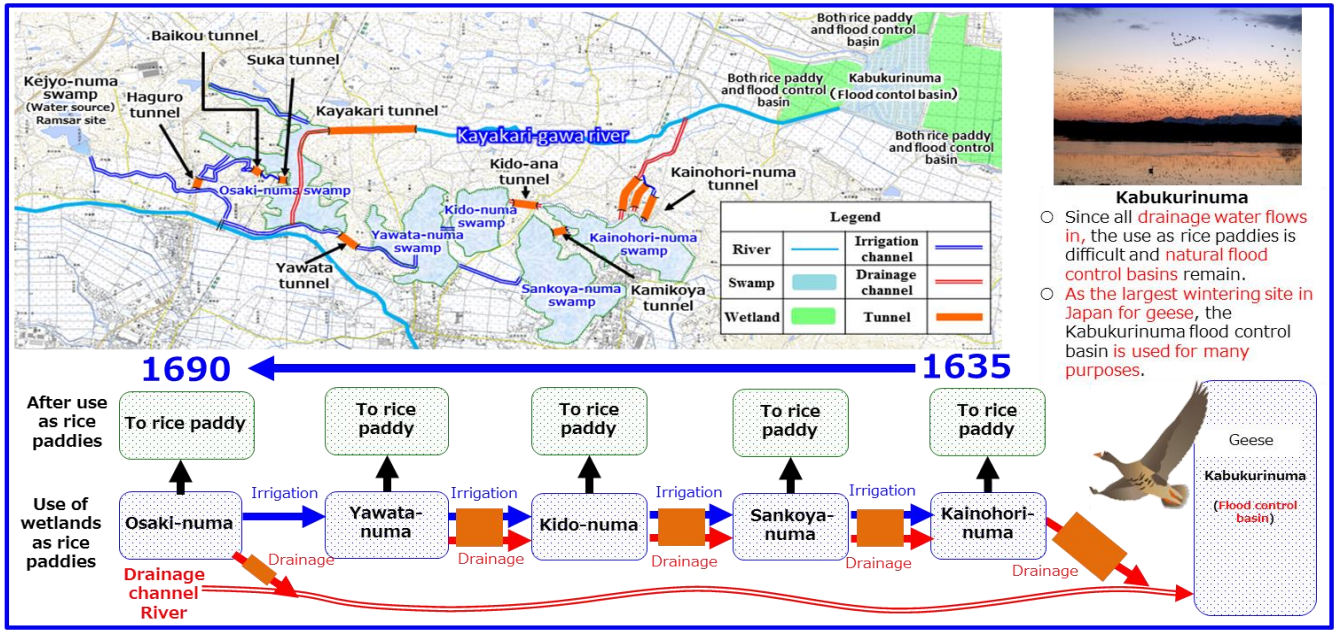


**>Characteristics**

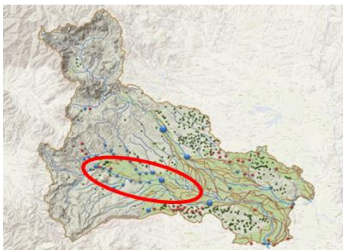
- Swamps are scattered in low-lying areas surrounded by hilly areas and drainage is difficult as it is hampered by the hills
- To use for rice paddies, knowledge about the draining of swamps + securing irrigation water for new rice paddies is necessary

**>Knowledge of adaptation**

- Drain water from swamps through tunnels and use as new rice paddies
- After the use of new rice paddies progresses, secure the irrigation water to upstream wetlands through tunnels



### ④ Alluvial fan area using weirs, reservoirs and recycled water



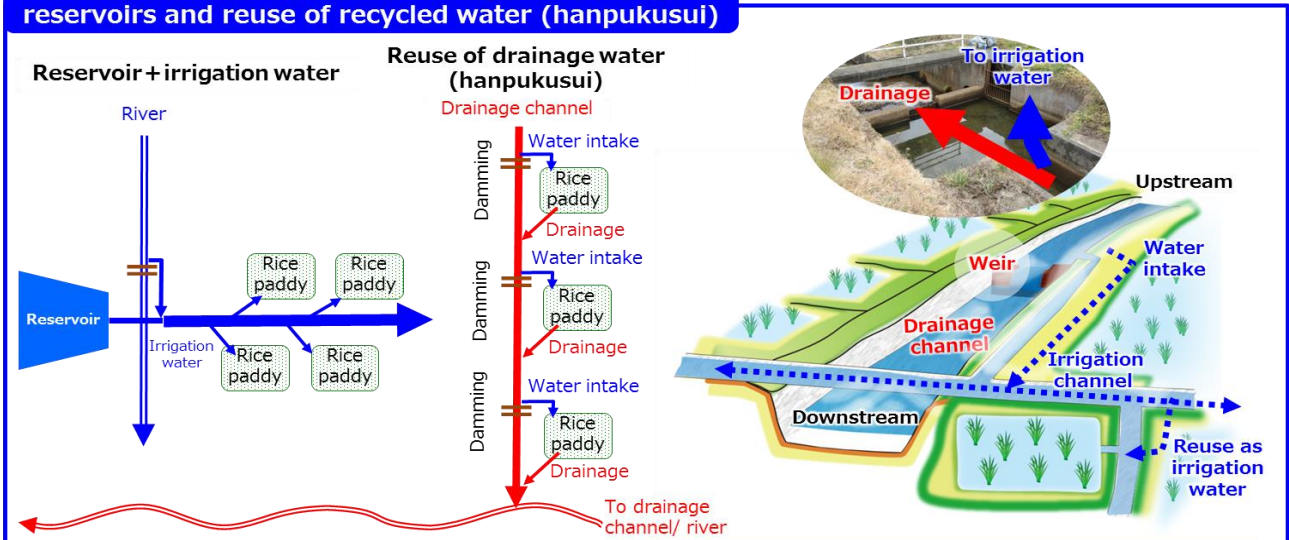
**>Characteristics**

Irrigation water is difficult to secure because of steep inclination and fast flow speeds.

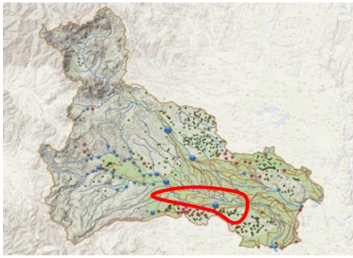
**>Knowledge of adaptation**

- Take water attentively from large and small river weirs, tunnels and reservoirs mainly from the Naruse River.
- Install water reuse channels for damming drainage water to use it as irrigation water

**Scheme of attentive water management through reservoirs and reuse of recycled water (hanpukusui)**



## ⑤ Hilly area using irrigation tunnel networks to supply water to farmland and reservoirs



### > Characteristics

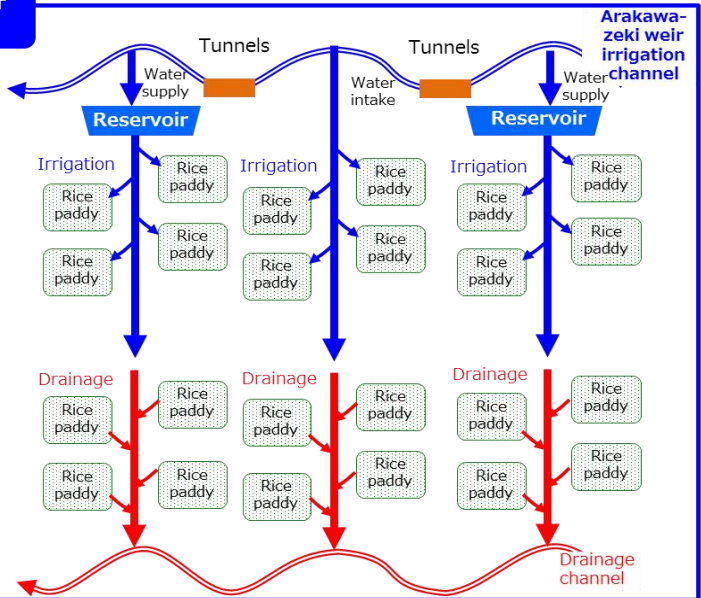
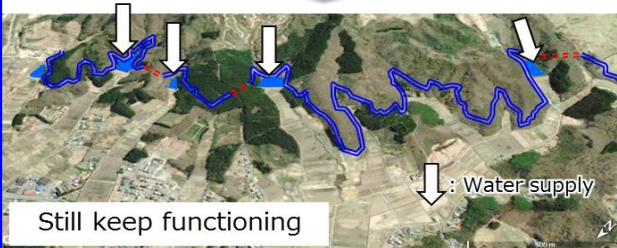
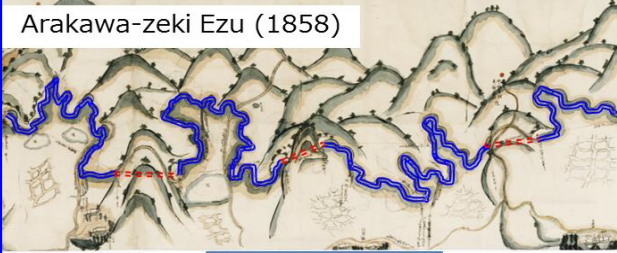
- Water is difficult to take from a neighboring large river.
- Because of small water catchment "reservoir", which is one of the important water resources, water supply to reservoir is necessary.

### > Knowledge of adaptation

- Excavated about 33 km of the "Arakawa-zeki" weir irrigation channel (12 tunnels) on a hillside (1646-49)
- The mountain channels and reservoirs with water supplied from there are still used as an important water resource.

### Mountain channels in hilly areas and the scheme for supplying water to reservoirs

Arakawa-zeki Ezu (1858)



## ⑥ Low plain area using rice paddies as flood control basins



### > Characteristics

- The inclination of the downstream basin is very gentle, at about 0.0004 degrees.
- The area is prone to experience massive flooding in typhoons or concentrated rainfall.

### > Knowledge of adaptation

- People enjoy the blessings of nature, engaging in agriculture and fishing in rice paddies daily.
- When the area is hit by a major flood, taking advantage of the fact that rice is relatively resistant to flooding, the flood water can be guided into some of the rice paddies (flood control).
- Reduces flood damage to other rice paddies or villages (disaster reduction)

**Kabukurinuma flood control basin**  
Area: 582 ha

**Shinainuma flood control basin**  
Area: 372 ha

**Nabirenuma flood control basin**  
Area: 150 ha

Flood control by using rice paddy

Use frequency: once/5 years

Use frequency: once/4 years

Use frequency: once/5 years



## 6. List of Ingenious Water Management Infrastructure

### (1) Intake sluices (including sluice gates and lock gates)

No.	Name, etc.	Municipality in which located, etc.	Period
1	Tatemaie Great Sluice	Kami District	Bunei era (1264–1274)
2	Shida Sluice (Kamikawara Sluice, Tagawa Sluice)	Kami District	1640
3	Arakawa Sluice	Shikama Town; Sanbongi/Matsuyama, Osaki City	1655
4	Ko-orie Sluice	Sanbongi, Osaki City	1711
5	Ukyoe Sluice, Eai River Course	Furukawa, Osaki City	1771
6	Eai River Meiji Sluice Gate completed	Wakuya Town	1890
7	Construction begun on Chiyokubo Sluice Gate	Toda District	1900
8	Ogawa Lock Gate completed	Kashimadai, Osaki City	1907
9	Karasaki Sluice Gate	Wakuya Town	1922
10	Hirayanagi Sluice Gate	Tajiri, Osaki City	1924
11	Semi Sluice (Miyazaki Sluice)	Kami Town	1659–1669
12	Hara Sluice	Kami Town	1670–1680
13	Hakkamura Sluice (Koze Sluice)	Kami Town	Middle ages–early modern period (exact year unknown)
14	Ashimizu Sluice	Kami Town	Around 1897
15	Hakidame Sluice (Great Sluice)	Kami Town	Middle ages–early modern period (exact year unknown)
16	Kimigafukuro Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
17	Yachimori Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
18	Karasu River Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
19	Minamihara Hole Sluice	Naruko Onsen, Osaki City	1644–47
20	Toda Irrigation Sluice	Toda District	1727
21	Terui Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
22	Kotakari Sluice	Kami Town	Around 1897
23	Myozen Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
24	Tateshita Sluice (Fumoto Sluice)	Kami Town	Middle ages–early modern period (exact year unknown)
25	Masaka Sluice	Kami Town	Around 1659
26	Tsukizaki Sluice (Moniwa Sluice)	Kami Town	Middle ages–early modern period (exact year unknown)
27	Futatsuishi Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
28	Kawakubo Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
29	Ochiai Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
30	Koizumi Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
31	Sainokami Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
32	Sabusawa Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
33	Igarashi Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
34	Kawazokosawa Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
35	Sakashita Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
36	Yukizawa Sluice	Kami Town	Middle ages–early modern period (exact year unknown)
37	Iriai Sluice	Kami Town	Middle ages–early modern period (exact year unknown)

## (2) Tunnels

No.	Name, etc.	Municipality in which located, etc.	Period
1	Gotoe Tunnel	Furukawa, Osaki City	1596–1610
2	Toyasaka Tunnel and 2 others	Nango, Kami Town; Higashi-Matsushima City	1665
3	Mitsuya Tunnel	Nango, Kami Town; Higashi-Matsushima City	1665
4	Shinainuma Kuratsubo Tunnel	Kashimadai, Osaki City	1693–1698 and other dates
5	Shinainuma Genroku Tunnel	Kashimadai, Osaki City	1693–1698 and other dates
6	Kayakari Tunnel	Furukawa, Osaki City	Early modern period (exact year unknown)
7	Kuratsubo Tunnel	Toda District	1688
8	Former Sanbyakken Tunnel	Kami Town	Early modern period (exact year unknown)
9	New Sanbyakken Tunnel	Kami Town	Early modern period (exact year unknown)
10	Naganuma Tunnel	Kami Town	Early modern period (exact year unknown)
11	Torishima Tunnel	Kami Town	Early modern period (exact year unknown)
12	Hara Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
13	Hyakken Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
14	Ranto Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
15	Kyushiro Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
16	Yamanokami Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
17	Aoyama Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
18	Kannonsawa Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
19	Kojirosawa Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
20	Nakanosawa Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
21	Haji Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
22	Kaido Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
23	Takoda Tunnel	Sanbongi, Osaki City	Early modern period (exact year unknown)
24	Haguro Tunnel	Furukawa, Osaki City	Early modern period (exact year unknown)
25	Baiko Tunnel	Furukawa, Osaki City	Early modern period (exact year unknown)
26	Suga Tunnel	Furukawa, Osaki City	Early modern period (exact year unknown)
27	Hachiman Tunnel	Tajiri, Osaki City	Early modern period (exact year unknown)

28	Kido Hole	Tajiri, Osaki City	Early modern period (exact year unknown)
29	Kamigoya Tunnel	Tajiri, Osaki City	Early modern period (exact year unknown)
30	Kainohori Tunnel	Tajiri, Osaki City	Early modern period (exact year unknown)

### (3) Water channels

No.	Name, etc.	Municipality in which located, etc.	Period
1	Iwadeyama Great Sluice Water Channel, Uchi River	Iwadeyama, Osaki City	1591
2	Channel Merging the Eai and Kitakami Rivers	Wakuya Town	1616
3	Amida Bay Water Channel	Kashimadai, Osaki City	1766
4	Aokisawa Open Cut	Toda District	1832
5	Kamata Ditch	Shida District	1851

\*Refer to the history of each municipality

Literature referenced: Kiyoshi Takakura, "The Tunnels of Sendai Province," Konno Printing Co., Ltd., 2002  
Tohoku Regional Agricultural Administration Office, "Historical Chronology of Water and Land Maintenance"

Website referenced: Agricultural and Rural Development Information Center, "The Foundations of Water and Land"  
<http://suido-ishizue.jp/history/tohoku/miyagi.htm>

## 7. List of the Number of Occurrences of Disasters Caused by Cold Weather

Type of weather disaster	Cold weather damage	Frost	Sustained rain	Early cold	Early frost	Heavy rain	Unseasonable weather	Total of causes of cold weather damage
Number of occurrences	52	3	37	10	7	1	7	117

Source: Miyagi Prefecture Agricultural Civil Engineering History (1600–1988)

Diagram: Rice Crops and Cold Weather Damage in Tohoku “The State of Occurrences of Cold Weather Damage” (1972–2003)

## 8. Supplementary Information about Cultures, Value Systems and Social Organizations (Farming Culture)

### (1) Details of agricultural rituals

Agricultural rituals refer to those among the various events held throughout the year which are deeply connected to agricultural life and are held at the transition points between each stage of agricultural production in order to pray for a fruitful harvest. It can be considered that the progression for such rituals usually takes the following course: Preliminary celebration stage (preparation for farming) → averting hazards/warding off misfortune stage (tending & protecting the field) → offering thanks stage (harvest). The principal agricultural rituals of Osaki Kōdo are described here following the outline given above.

#### a) Rituals of preliminary celebration

##### i) “New Year’s Ritual at Konpoji Temple” (Miyagi Prefecture Designated Cultural Property)

Wakuya Town Nonodake Hakusan Festival: In January of each year, the Hakusan Shinto Ritual, central to the belief in agricultural gods in the Wakuya area, is held at Hakusan Shrine. Child participants shoot arrows in a ritual to foretell whether the year’s harvest will be rich or poor.

##### ii) “Yanagisawa Yakehachiman” (Miyagi Prefecture Designated Cultural Property)

An event to mark the Little New Year, held in Yanagisawa, Miyazaki, Kami Town from January 14 to the early morning of January 15. An object known as a “tōrō,” made from 12 bundles of straw tied together, is burned in front of Hachiman Shrine to foretell the year’s harvest, as well as to pray to avert fires and for an abundant crop and the wellbeing of one’s family.

##### iii) “Kirigome no hadaka kasedori (Kirigome Naked Kasedori)” (Miyagi Prefecture Designated Cultural Property)

An event held in Kirigome, Miyazaki, Kami Town on the evening of January 15 under the old lunar calendar. One boy aged 15 or over from each of the houses in the village takes part, and all the participants, who are naked, visit every house in the village as a group. At this time, *Kasedori mochi* (mochi) are distributed.

#### b) Rituals to avert hazards/ward off misfortune

##### i) Mukeno First of the Month

On June 1, mugwort leaves which were picked on the day of the May seasonal festival in order to avert fire and illness are placed on a wooden dish known as “zakki,” which is set alight and rubbed over the threshold of the entrance as a charm against fire. In addition, participants rub it over the entirety of their bodies as a spell for good health. Dried mochi from the New

Year celebration are eaten, as it is said that these harden the teeth, and new mochi are pounded to celebrate the festival. (Furukawa, Tajiri, Sanbongi, Matsuyama, Iwadeyama, and Naruko in Osaki City; Kogota in Misato Town; Shikama Town)

ii) Flea Boats

On June 1, the seeds of wild *Reynoutria sachalinensis* (a type of Japanese knotweed) and sorrel are threshed and spread out on the floor of the main rooms of houses for fleas to use as boats in this magical rite. (Iwadeyama in Osaki City; Onoda and Miyazaki in Kami Town; Shikama Town)

iii) Mushiokuri (Sending-off of Insects/Memorial Service for Insects), Kappa (Okappasama)

On June 15, rice is boiled with red beans, then wrapped in bamboo leaves or a straw wrapper and placed on the roadside. There was also a custom of striking gongs and drums to drive insects out of the village. In addition, on the days of the festivals of the Heavenly King (the Gozu Emperor) and of *Okappasama* (the river spirit), cucumbers are not to be eaten before offering them to *Okappasama*. Cucumbers are floated down the river. (Furukawa, Tajiri, Sanbongi, Iwadeyama, and Naruko in Osaki City; Kogota in Misato Town; Miyazaki in Kami Town; Shikama Town)

iv) Sending-off of the Bō god

On June 20, people put dumplings into straw bundles and hang them in doorways, saying “Sending off the Bō god, the Hayari god, the God of 404 Diseases.” Dumplings are also ritually offered at crossroads and junctions of three roads to send off the God of Disease. (Shikama Town)

v) Summer Purification Rites

Also known as the “Passing of Summer Seasonal Festival,” it is a day of abstinence held on June 30 in order to begin a new season. It was believed that the Kappa (water god) came down from the mountains on this day, and people, horses and cattle were bathed in a ritual purification. (Furukawa, Tajiri, Sanbongi, and Naruko in Osaki City)

c) Rituals to give thanks for the harvest: “Yonekura Kashima Jinja no Kensen Gyoji (Yonekura Kashima Shrine Food Offering Ritual)” (Miyagi Prefecture Designated Cultural Property)

Held each year on September 9 at Yonekura Kashima Shrine, Furukawa, Osaki City, which is said to have been constructed in 1535. The food offering ritual is a nighttime festival in which the new crop is presented to the patron deity during a communal meal between gods and humans. It is ranked as a festival for the ceremonial offering of newly-harvested rice.

## (2) Folk beliefs

Folk beliefs indicate the everyday beliefs held by ordinary people, which came about and

developed among the general populace within local communities as they went about the routine of their everyday lives. The folk beliefs which have taken root in Osaki Kōdo are described here.

a) Hayama Belief at the foot of Funagatayama Mountain

Many shrines have been constructed around the eastern base of Funagatayama Mountain (1,500 m), a high peak in the Ou mountain range, from ancient times. In rites held at Yakurai Shrine in Kami Town's Onoda district, Funagata Shrine and Funagatayama Shrine in Shikama Town, the Buddhist deity of healing, Yakushi Nyorai, is taken to be the original Buddhist identity of a Shinto deity. The shrines are divided into the *satomiya* (village shrine) and *yamamiya* (mountain shrine) buildings, and the god is summoned on the mountaintop. The date of the rites is April 8 under the old lunar calendar at all three shrines. From this summoning on the mountain the link to an agricultural deity's festival is strong, so it is considered that the Hayama Belief is one variation in the worship of the God of Agriculture.

Features characteristic of the God of Agriculture are seen in the *Bondenbayai* ritual of Funagatayama Shrine, the *Satsukimairi* ritual of Funagata Shrine, and the *Oyamanobori* ritual of Yakurai Shrine. The Hayama Belief became widely established in Osaki Kōdo, at the base of Funagatayama Mountain, from the medieval period onwards. It is thought to have a deep connection to the ascetic mountain monks of the Haguro sect, such as the "Five Male Gods of Kami District" set up together by Lord Osaki. The vestiges of the Hayama Belief which have been passed down to this day can be found in the stone monuments connected to the Funagatayama faith in Nishiarai (1819) and Nagaokahari (1894), Furukawa, Osaki City, and in Numabe Sakurada, Tajiri, in the same city (1861).

b) Ta-no-kami (God of the rice paddies)

There is a belief which involves praying to the God of the rice paddies, who brings the rice harvest, and giving thanks for a bountiful crop. This belief has been handed down in the following ways.

Before the rice seedlings are planted, *sake* for the gods is poured over the rice paddies, hands are placed together in prayer, and a stick decorated with white colored paper is erected at the point where the water enters the field. Then seedlings are offered at the household shrine to the God of Harvests in order to pray for a bountiful harvest. (Furukawa, Osaki City)



Photo: Seedlings are offered at the household shrine to pray for a rich harvest.

c) Suijin (Water God)

The agriculture of Osaki Kōdo is supported by the gift of water obtained from rivers large and small, such as the Eai River and Naruse River. Prayers are offered for plentiful water from the Eai

River, one of the principal rivers supporting rich harvests in the Osaki area, and for flood control. The god who rules the source of the Arao River, the headwaters of the Eai River, has been worshipped from ancient times, and even now, a ritual is held every year.



Photo: The Water God Belief, which has survived completely unchanged

d) God of the Hearth

In the area of the former Sendai domain extending from the center and north of Miyagi Prefecture to the south of Iwate Prefecture, which includes Osaki Kōdo, there is a belief which involves worshipping the mysterious power of fire, indispensable to daily life, and praying to the god of fire, known as the God of the Hearth, for the safety and prosperity of one’s family. The object of worship is the mask of a stern-looking demon-god, enshrined in the kitchen above the cooking fire or at the top of the central pillar of the house. In the Furukawa area, it is also being utilized for local revitalization.



Photo: The God of the Hearth

**(3) Mochi (rice cake) food culture (the principal mochi dishes of Osaki Kōdo)**

Cooked	<i>Mochi</i> with mashed green soybeans, <i>mochi</i> with seaweed, deep fried <i>mochi</i> , <i>mochi</i> with fermented soy beans, <i>mochi</i> with ground walnuts, <i>mochi</i> with red bean paste, <i>mochi</i> with sweetened soy flour, boiled <i>mochi</i> , <i>mochi</i> in soup, toasted <i>mochi</i> with sweetened soy flour, <i>Sato mochi</i> , <i>mochi</i> with rice syrup, sweetened vinegar <i>mochi</i> , <i>Fusube mochi</i> , <i>mochi</i> with ginger, <i>Nanban mochi</i> , <i>mochi</i> with wasabi, <i>mochi</i> with sesame, freeze-dried <i>mochi</i> , <i>mochi</i> with shrimp, <i>Kaniko mochi</i> , <i>mochi</i> with oilseed perilla, <i>mochi</i> with soy sauce, rice porridge with seven spring herbs, rice porridge with red beans, milk <i>mochi</i> , tuna <i>mochi</i>
Garnished	<i>Mochi</i> with mugwort, <i>mochi</i> with arrowroot, <i>mochi</i> with burdock leaves, <i>mochi</i> with sweet chestnut, <i>mochi</i> with horse chestnut, white <i>mochi</i> , <i>mochi</i> with millet, <i>mochi</i> with miso, frozen <i>mochi</i> , <i>mochi</i> with black beans and soy beans, <i>mochi</i> made with flour from the new crop, <i>mochi</i> covered with bean paste, <i>Ma mochi</i> , dimpled <i>mochi</i> , <i>mochi</i> grilled with sweet miso paste, <i>Aka-aka mochi</i> , <i>mochi</i> with bracken starch, sliced and dried <i>mochi</i> , <i>Hako mochi</i>

**(4) Local cuisine**

There is also a food culture that emerged as a substitute for rice when the rice crop has failed. For example, the wheat flour dish known as “hatto,” “hittsumi,” or “tottenage,” made by adding water to wheat flour, kneading it well, letting it ripen, and boiling the thinly-rolled dough, as well as soups made by adding vegetables and other ingredients to this confection. These include “Suppoko soup” from



Kogota, Misato Town, and “Water chestnut rice” from Kashimadai, Osaki City, in which water chestnuts picked in the wetlands such as Shinai Marsh are mixed with rice. The cultivation of water chestnuts is being revived alongside efforts to conserve the endangered species of fish *Pseudorasbora pumila pumila*.



Photo: Local cuisine “Suppoko soup”

### (5) Fishing in the rice paddies

The rice paddies have also been used as a place to fish. The living creatures of the rice paddies, such as loaches, opossum shrimps, and pond snails, are a valuable source of protein, and fishing can be observed in the agricultural drainage ditches after the harvest. Separately from this, in reservoirs constructed in mountain valleys, which were not blessed with water supplies from rivers, fishing for crucians and carp was carried out with the simultaneous purpose of dredging the mud.







Although the use of the catch from paddy field fishing is diminishing, due to the introduction of nonnative species and changes to dietary habits in recent years, a culture of eating loaches deep-fried or in soup, and of eating crucians, bitterlings, Japanese rice fish, etc. sweetened and boiled persists in each area of this region.













Photo (L): Fishing in an agricultural drainage ditch




Photo (R): Removing the slime from loaches

## 9. List of Principal Agricultural Rituals and Folk performing arts

No.	Name [Preserving organization]	Classification	Area	Overview	Photograph
1	Wakamiya Hachiman Shrine Boiling Water Ritual	Agricultural ritual	Wakamiya district, Sanbongi, Osaki City *Osaki City Designated Intangible Folk Cultural Property	A mystical ascetic practice to pray for good health and a bountiful harvest, in which the shrine priest uses bamboo leaves to beat his body with water boiled in a large cauldron, while chanting spells. This boiling water ritual has been carried out since 1189, and Wakamiya Hachiman is the only shrine at which it takes place.	
2	Yonekura Kashima Jinja no Kensen Gyoji (Yonekura Kashima Shrine Food Offering Ritual)	Agricultural ritual	Yonekura district, Furukawa, Osaki City *Miyagi Prefecture Designated Intangible Folk Cultural Property	A serene nighttime festival to give thanks for the grain harvest, held each year in September since 1598. It begins with the offering of the first rice, and ends the next day when the portable shrines are carried in procession.	
3	Niida Komatsu Shrine Festival [Niida Komatsu Shrine Festival Preservation Society]	Agricultural ritual	Niida district, Furukawa, Osaki City	On the first Sunday in June, around the time the rice planting finishes, the Komatsu Shrine Rice Seedling Performance is held to pray for the steady growth of the seedlings. It is now listed as one of Miyagi Prefecture's rare festivals.	
4	Oyumi Shinji (Archery Ritual)	Agricultural ritual	Nonodake district, Wakuya Town *Miyagi Prefecture Designated Intangible Folk Cultural Property	Held in January each year, child participants shoot arrows to foretell the year's weather and pray for a bountiful harvest.	
5	Yanagisawa Yakehachiman [Yanagisawa Young People's Association]	Agricultural ritual	Yanagisawa district, Miyazaki, Kami Town *Miyagi Prefecture Designated Intangible Folk Cultural Property	A rare event with a 600-year tradition, held each year from January 14 to 15 to pray to avert fires and for an abundant crop and the wellbeing of one's family. A hut made of bamboo and straw is set alight, and the direction of the smoke is interpreted to foretell the prospects for the year's crop.	
6	Atago Devotional Gathering	Agricultural ritual	Nakaniida, Kami Town *Kami Town Designated Intangible Folk Cultural Property	This ritual began in 1861, and has a 150-year history. The god of Atago is in charge of protection from fire, and as the War God of safeguarding warriors' horses. From the start of the Meiji Period, the god has also been the protector of horses used in agricultural work.	






No.	Name [Preserving organization]	Classification	Area	Overview	Photograph
7	Koizumi no Mizusyugi (Koizumi Water Celebration) [Koizumi Contractual Association]	Agricultural ritual	Koizumi district, Miyazaki, Kami Town *Miyagi Prefecture Designated Intangible Folk Cultural Property	Held to welcome newly married couples, as well as to pray for the protection of each household from fire. This Water Celebration is an extremely rare event even on a national level.	
8	Kirigome no hadaka kasedori (Kirigome Naked Kasedori) [Kirigome Association for Harmony]	Agricultural ritual	Kirigome district, Miyazaki, Kami Town *Miyagi Prefecture Designated Intangible Folk Cultural Property	This event is to avert fire and ward off the misfortune associated with particular ages. It is also known as “Kirigome Sumitsuke.” When this festival was abandoned for a time, the area suffered from seven fires in one year, and so the festival was revived to avert fire and has continued to this day.	
9	Hoyanagi Shinto Music [Hoyanagi Shinto Music Preservation Society]	Folk performing art	Hoyanagi district, Furukawa, Osaki City	The story tells that this tradition began 450 years ago, when the lord of Hoyanagi Castle had the populace dance. It draws principally on the Nambu Shinto music tradition, but also incorporates Sako Shinto music elements in part, and the dynamic dance is also accompanied by a somewhat melancholy atmosphere. The dance has been offered to the local deity of Kumano Shrine since long ago to pray for a bountiful harvest.	
10	Nambu School Nagase Shinto Music [Nambu School Nagase Shinto Music Preservation Society]	Folk performing art	Fukunuma district, Furukawa, Osaki City	The Nagase (now Fukunuma) district prospered greatly as an area for the shipment of the local “Honkoku” rice from the feudal era. This tradition began at the start of the Meiji Period (1868-1912), when a master sake brewer who came from the Nambu region to work taught Nambu Shinto music to the young people of Nagase. The “Dance of the Great Water God” and “Dance of the Five Great Dragon Kings” are extremely flamboyant.	
11	Kawakuma Shinto Music [Kawakuma Shinto Music Preservation Society]	Folk performing art	Kawakuma district, Furukawa, Osaki City	This draws on the tradition of Nagase Shinto Music which was transmitted at the start of the Meiji Period. The ritual lapsed for a time, but in 1982, a preservation society was established to preserve and hand down this Shinto music with its tradition of praying for a bountiful harvest as a local performing art. It is now being passed down as Shinto music firmly established in the district.	

No.	Name [Preserving organization]	Classification	Area	Overview	Photograph
12	Yanome Rice Planting Dance [Yanome Rice Planting Dance Preservation Society]	Folk performing art	Yanome district, Furukawa, Osaki City	This rice planting dance, danced each New Years to celebrate the year's abundant harvest in advance, was brought to the Yanome district in the early Showa Period. Amidst a rapid modernization of agriculture, this is being preserved and handed down as one of the typical dances of Osaki City.	
13	Tokeiinari Drumming	Folk performing art	Araya district, Furukawa, Osaki City	The drums which are enshrined in the front hall of Tokeiinari Shrine are placed on a large two-wheeled hand-drawn cart and pulled around the town on foot as they are beaten to commemorate an abundant harvest. The flutes and drums of the Tokei Festival, expressing people's reverence and adoration of the great Tokeiinari god and prayer for an abundant harvest in the form of playing joyfully with the god, produce a lively piece of music.	
14	Obaraya Drumming	Folk performing art	Furukawa, Osaki City	In the middle of the Edo Period, after the harvests failed for three years in succession, the farming folk danced wildly, leaping like grasshoppers as they went to worship at the shrine. As a result, they were blessed with an abundant harvest that year. Ever since, this has been danced in order to pray for a good harvest, and continues until this day.	
15	Miyabukuro Masutori Mai (Miyabukuro Picking Up Boxes Dance) [Miyabukuro Picking Up Boxes Dance Preservation Society]	Folk performing art	Miyabukuro district, Furukawa, Osaki City	Brought to Miyabukuro around 1942 as a rustic dance praying for an abundant harvest and giving thanks for the harvest. The God of the Rice Paddies (a clown) joins the dance halfway through and dances with the others, and after the dance has finished, red and white mochi are scattered into the crowd to pray for or celebrate a bumper harvest that year.	
16	Inaba Procession of a Feudal Lord's Vanguard [Inaba Procession of a Feudal Lord's Vanguard Preservation Society]	Folk performing art	Inaba district, Furukawa, Osaki City	This event with a long pedigree, which was brought to Gion Yasaka Shrine in the Tokugawa Period, is held only on congratulatory occasions such as the festival giving thanks for the rice harvest.	

No.	Name [Preserving organization]	Classification	Area	Overview	Photograph
17	Nakazato Procession of a Feudal Lord's Rearguard [Nakazato Procession of a Feudal Lord's Rearguard Preservation Society]	Folk performing art	Nakazato district, Furukawa, Osaki City	It was originally a procession of the vanguard and rearguard, but at the time of the procession of the portable shrine during the Gion Shrine festival in 1702, it was decided that Inaba Village would be the "vanguard" and Nakazato Village would be the "rearguard."	
18	Furukawa Demon Drumming [Furukawa Mizumo Society]	Folk performing art	Furukawa, Osaki City	In order to save their lives and protect the harvest of the fertile Osaki Kōdo from the attacks of a demon god, Otakemaru, who had caused repeated damage, the people put on demon masks, lit a bonfire, and beat drums fiercely. Each year, drums continue to be played to pray for the year's harvest.	
19	Tsugihashi Shinto Music [Tsugihashi Shinto Music Preservation Society]	Folk performing art	Tsugihashi district, Matsuyama, Osaki City *Osaki City Designated Intangible Folk Cultural Property	Tsugihashi Shinto music, which draws on the tradition of Nambu Shinto music, was introduced by a famous drummer from the Nambu region at the beginning of the Meiji Period. The tradition overcame a crisis when the younger generation of the district left agriculture for other industries during the period of rapid economic growth, and has been handed down to the present day.	
20	Kanazu School Matsuyama Lion Dog Dance [Kanazu School Matsuyama Lion Dog Dance Preservation Society]	Folk performing art	Matsuyama, Osaki City	Performed by dancers who wear ornamental plumes called "sasara" on their backs and don lion dog heads while singing accompanied by drums. It was danced in the Matsuyama district until modern times, and revived in 1993 after a period in which it was not performed. It is a prayer for the repose of the souls of the ancestors, the expulsion of evil spirits, and a bountiful harvest, and is being handed down as a religious performance offered at the festival of the local shrine.	
21	Obasama Monkitsuki [Obasama Monkitsuki Preservation Society]	Folk performing art	Obasama district, Kashimadai, Osaki City	"Monkitsuki" is a construction method which involves driving in piles by hand. From the Genroku Period (late seventeenth century) until the Showa Period (twentieth century), land reclamation projects were carried out in Shinai Marsh, a marsh which once stretched over 18 km <sup>2</sup> in Obasama district, and the <i>Monkitsuki</i> construction method played an	

No.	Name [Preserving organization]	Classification	Area	Overview	Photograph
				important role in reinforcing the soft ground.	
22	Kashimadai Drumming [Kashimadai Drumming Rokusyoukai Association]	Folk performing art	Kashimadai, Osaki City	At the “Straw Sandals Festival,” which honors the venerable Sannosuke Kamada, a great pioneer of the development of Kashimadai, drums are indispensable instruments. Kashimadai drumming involves the singing of the ancient, medieval, modern, contemporary, and future history of Kashimadai to the rhythm of the drums.	
23	Fukuya Shinto Music	Folk performing art	Fukuya district, Kashimadai, Osaki City *Osaki City Designated Intangible Folk Cultural Property	This tradition began with the introduction of Hoin Shinto music in the Kanei Period (first half of the seventeenth century), and Fukuya Shinto music proper was born in 1925. It was first offered to the gods in the harvest season, and has since been handed down in gratitude for favorable weather and as a central aspect of the annual festival.	
24	Iwadeyama Okura School Noh Songs [Iwadeyama Okura School Noh Songs Preservation Society]	Folk performing art	Iwadeyama, Osaki City *Osaki City Designated Intangible Folk Cultural Property	Mr. Yumura, the head of the Okura School in Iwadeyama district, went to Kyoto and studied Noh songs of the Okura School. After his return from Kyoto, he was treated very generously by the Date clan as a teacher of Noh songs. The songs spread among the ordinary people, and Okura School songs came to be performed widely.	
25	Mayama Shinto Music [Mayama Shinto Music Preservation Society]	Folk performing art	Iwadeyama, Osaki City *Osaki City Designated Intangible Folk Cultural Property	Introduced in 1883 by a direct successor of Takkotai Shinto music from Haguro, Ichinoseki City, Iwate Prefecture. In 1983, the dancers were taught the Chicken Dance, which prays for the repose of the souls of the ancestors and a bountiful harvest, and this was taught to elementary school students from the following year. The activities of the Preservation Society have been archived by the Agency for Cultural Affairs.	
26	Fir Tree Shinto Music [Fir Tree Shinto Music Preservation Society]	Folk performing art	Iwadeyama, Osaki City *Osaki City Designated Intangible Folk Cultural Property	Formerly known as “Nambu Shinto Music,” it has been performed since before the Meiji Restoration. The repertoire is composed of 28 different items, such as the “Sanbaso,” which prays for a good harvest.	



No.	Name [Preserving organization]	Classification	Area	Overview	Photograph
27	Onikobe Shinto Music [Onikobe Shinto Music Preservation Society]	Folk performing art	Naruko Onsen district, Osaki City	Its origins are unclear, but it is said that it was performed when warriors from Kyoto, Kansai, or Kanto came to the Ou district, transmitted to Iwate Prefecture and to Kurihara City, and then also to the Onikobe district. The dancers perform content rich in emotion.	
28	Kawatabi Seven Gods of Good Fortune (Daikoku Dance) [Kawatabi Seven Gods of Good Fortune Preservation Society (Daikoku Dance)]	Folk performing art	Kawatabi district, Naruko, Osaki City	330 years ago, in the time of Munechika Date, the third castellan of Iwadeyama, a dance in the costumes of the Seven Gods of Good Fortune was first performed. The “Daikoku Dance” is said to bring good fortune. The “Dance of the Seven Gods of Good Fortune,” danced by performers dressed as the various gods, also continues to be passed down.	
29	Naruko Gion Lion Dog Dance [Naruko Gion Lion Dog Dance Preservation Society]	Folk performing art	Naruko, Osaki City	It is said that this tradition began on the occasion when Minamoto no Yoritomo advanced his troops to Naruko for the subjugation of Yoshitsune, his younger brother, and the Fujiwara in Hiraizumi, and brought the Lion Dog Shinto Music of Kamakura’s Tsurugaoka Hachimangu Shrine to Naruko Onsen Shrine to pray for victory, giving it an 800-year history. It is a cheerful dance accompanied by flutes and drums.	
30	Shundo School Noh Songs [Shundo School Noh Songs Preservation Society “Potted Tree Society”]	Folk performing art	Onuki district, Tajiri, Osaki City	As one of the schools popular in the Edo Period, the Sendai Domain Boisterous Dance Method was introduced, and became established and handed down within the Wakudani-Date family’s village of Onuki Nittanome. The “Potted Tree Society” is the only group in Japan which has inherited the tradition of the Shundo School.	
31	Takagi Lion Dog Dance [Takagi Lion Dog Dance Preservation Society]	Folk performing art	Takagi district, Shikama Town	With the fertile land as a stage, the dancers go from house to house to pray for a bountiful harvest and drive out evil spirits and disease. The lion dogs and deity of the mountain dance a lively dance to the accompaniment of drums and flutes.	

No.	Name [Preserving organization]	Classification	Area	Overview	Photograph
32	Kiyomizu Shinto Music [Kiyomizu Shinto Music Preservation Society]	Folk performing art	Kiyomizu district, Shikama Town *Shikama Town Designated Intangible Cultural Property	Kiyomizu Shinto music is a wordless form of “village Shinto music” without lines. Drawing on the Nambu Shinto music tradition, it is composed of about 20 pieces of music. In Kiyomizu Kannon Temple, there is a votive plaque offered in 1900 showing the teaching of Shinto music, telling us about its appearance at that time.	
33	Kiyomizu Rice Planting Dance	Folk performing art	Kiyomizu district, Shikama Town *Shikama Town Designated Intangible Cultural Property	Offered at Kiyomizu Kannon Temple to pray for a bountiful harvest. It died out for a time after the War, but was revived in 1980. It is now being handed down by the local children.	
34	Senboku Wheat Hulling Dance	Folk performing art	Shimokurosawa district, Shikama Town	A dance to pray for a bountiful wheat harvest. It was revived around the late 1970s and has continued ever since.	
35	Nakaniida Tiger Dance [Nakaniida Fire Protection Tiger Dance Preservation Society]	Folk performing art	Nakaniida, Kami Town *Miyagi Prefecture Designated Intangible Folk Cultural Property	This tradition began 650 years ago in Nakaniida, where there were many major fires caused by seasonal winds, when a tiger dance was offered at the First Horse Day festival of the great Inari god, borrowing the might of the tiger to still the wind and pray for the prevention of fire. Each year on the First Horse Day festival, prayers are made for a bountiful harvest, prosperity in commerce, good fortune, and the wellbeing of one’s family.	
36	Yokkaichiba Lively Dance [Yokkaichiba Lively Dance Preservation Society]	Folk performing art	Yokkaichiba district, Nakaniida, Kami Town *Kami Town Designated Intangible Folk Cultural Property	The end of the left bank of the Naruse River is a place called Yokkaichiba Original Lodging Area, where this lively dance originated. The atmosphere of the active pursuit of exchanges and distribution of goods at Yokkaichiba, which prospered as one of the largest rice depots, has been handed down in this song.	



No.	Name [Preserving organization]	Classification	Area	Overview	Photograph
37	Nakajima Rice Planting Dance [Nakajima Rice Planting Dance Preservation Society]	Folk performing art	Nakajima district, Onoda, Kami Town *Miyagi Prefecture Designated Intangible Folk Cultural Property	Rice planting dances became dances of the ordinary people as ceremonies to pray for a bountiful harvest associated with a rice-growing culture. Nakajima Rice Planting Dance originated 370 years ago. The “God of the Rice Paddies,” the harvest god, makes an appearance, and this dance includes the aspect of an offering to the god.	
38	Tsukizaki Rice Planting Dance [Tsukizaki Rice Planting Dance Preservation Society]	Folk performing art	Tsukizaki district, Onoda, Kami Town *Miyagi Prefecture Designated Intangible Folk Cultural Property	A rice planting dance was brought here 700 years ago, and it is more than 350 years since the present dance became established. The dance depicts in an interesting manner how people long ago worked hard from the New Year’s celebrations to an abundant harvest to create incredibly beautiful rice paddies and finally were able to build golden mountains of grain.	
39	Yakurai Shrine Miwa School Shinto Music [Yakurai Shrine Miwa School Shinto Music Preservation Society]	Folk performing art	Onoda, Kami Town *Miyagi Prefecture Designated Intangible Folk Cultural Property	This music is a direct descendant of Hoin Shinto music, but within Miyagi Prefecture there are no identical or similar forms of Shinto music, making this a rare item of culture. Lion dogs with a fierce appearance, who intimidate everyone, drive away evil spirits and pray for a bountiful harvest.	
40	Onoda Lively Dance [Onoda Lively Dance Preservation Society]	Folk performing art	Onoda, Kami Town	It is said that the original song is one from the Soma region of Fukushima Prefecture. Composed of a song and a dance, the Onoda Lively Dance is thought to be a rain dance praying to the gods for rain to fall.	
41	Miyazaki Lion Dog Dance [Miyazaki Lion Dog Dance Preservation Society]	Folk performing art	Miyazaki, Kami Town *Kami Town Designated Intangible Folk Cultural Property	For the festival of Kumano Shrine, as well as accompanying the portable shrine, dances were offered at important locations. It is being passed down as a representative folk performing art, heroic and rich in local lore.	
42	Toriygasaki Hachiman Shrine Lion Dog Dance [Toriygasaki Hachiman Shrine Lion Dog Dance Preservation Society]	Folk performing art	Toriygasaki district, Miyazaki, Kami Town *Kami Town Designated Intangible Folk Cultural Property	Tradition tells that the Toriygasaki Lion Dog Dance existed in the Edo Period. Its main aim is to drive away evil spirits, and the dancers make their way around the neighborhood once every four years.	

No.	Name [Preserving organization]	Classification	Area	Overview	Photograph
43	Komeizumi Lion Dog Dance [Komeizumi Lion Dog Dance Preservation Society]	Folk performing art	The surroundings of Komeizumi district, Miyazaki, Kami Town *Kami Town Designated Intangible Folk Cultural Property	This lion dog dance has existed since the early Meiji Period, when it was performed every year in order to drive out evil spirits at the same time as the portable shrine was carried in procession. The lion dog dance now progresses around Komeizumi, Takada, and Higashi-komeizumi districts every five years.	
44	Kitakawauchi Shinto Music [Kitakawauchi Shinto Music Preservation Society]	Folk performing art	Kitakawauchi district, Miyazaki, Kami Town *Kami Town Designated Intangible Folk Cultural Property	This Shimatai Shinto music, which draws on the tradition of Nambu Shinto music brought to Nagasaki district, Kurihara City, began around 1887. In order to pray for a bountiful harvest, it is performed at the festival of the local guardian deity, Obon, New Years, and other holidays to provide rest and recreation for the farmers.	
45	Nonodake Hakusan Abundant Harvest Dance [Nonodake Hakusan Abundant Harvest Dance Preservation Society]	Folk performing art	Nonodake district, Wakuya Town	A dance formerly known as “Seed-Planting Shinto Music,” offered at a festival at which many people gathered from each area of Tohoku to exchange seed rice, it has since been revived. It is danced to pray for an abundant rice crop.	
46	Wakuya Town Traditional-style Lion Dog Dance [Wakuya Town Traditional-style Lion Dog Dance Preservation Society]	Folk performing art	Wakuya Town *Wakuya Town Designated Intangible Folk Cultural Property	Oral tradition tells that this dance was brought from Kyoto in 1552, along with a branch shrine of Atago Shrine. It has maintained the syncretism of Shinto and Buddhism of long ago, and is one of only a few examples of grand Shinto music in the prefecture, making it extremely rare.	
47	Wakuya Teahouse Tune Dance [Wakuya Teahouse Tune Dance Preservation Society]	Folk performing art	Wakuya Town	This teahouse tune has been sung as Wakuya’s celebratory song on the site of a well-loved mansion once known as the “Teahouse” since the time of the Date feudal lords 300 years ago. A dance was added to a song originally sung to the clapping of hands, and has been passed down ever since.	
48	Fudodo Shinto Music [Fudodo Shinto Music Preservation Society]	Folk performing art	Fudodo district, Kogota, Misato Town *Misato Town Designated Intangible Folk Cultural Property	Fudodo Shinto music, which has its roots in the Nambu Shinto music tradition, was brought here around 1899. Its unique flamboyance, with its rich repertoire, vigorous movement, and stirring rhythm of drums and voices has been thoroughly preserved.	

No.	Name [Preserving organization]	Classification	Area	Overview	Photograph
49	Sekine Shinto Music [Sekine Shinto Music Preservation Society]	Folk performing art	Sekine district, Kogota, Misato Town *Misato Town Designated Intangible Folk Cultural Property	This tradition began when Nambu Shinto music was brought here around 150 years ago. In the feudal era, the Sekine district prospered as a landing place for boats on the Eai River, which played an important role in the distribution of goods. A Hachiman dance to pray for the repose of the souls of the ancestors and for a bountiful harvest is now being passed down.	
50	Oyanagi Lion Dog Dance [Society of Friends of the Oyanagi Lion Dog Dance]	Folk performing art	Oyanagi district, Nango, Misato Town	The dancers progress around the neighborhood on foot, together with the portable shrine, to pray for a bountiful harvest and bite children's heads on the threshold of each house in order to pray for good health. The current dance expresses gratitude for the blessings of nature in a rhythmical, joyful manner.	

Source: “2012 Fiscal Year Archive of Traditional and Heritage Performing Arts of the Osaki District”



10<sup>th</sup> Meeting of the Conference of the Parties to the  
Convention on Wetlands (Ramsar, Iran, 1971)

*“Healthy wetlands, healthy people”*

Changwon, Republic of Korea,  
28 October-4 November 2008

**Resolution X.31**

**Enhancing biodiversity in rice paddies as wetland systems**

1. RECOGNIZING that rice is grown in at least 114 countries worldwide and, as the staple diet for over half the world’s population, has contributed to about 20% of the total calorie supply in the world;
2. AWARE of recent concern over global food supplies and costs and the need for increasing food production, and ALSO AWARE that Resolution X.23 on *Wetlands and human health and well-being* highlights the interdependencies between human health, food security, poverty reduction and sustainable wetland management and calls for Contracting Parties to “strengthen collaboration and seek new partnerships between the sectors concerned with wetland conservation, water, health, food security and poverty reduction”;
3. RECOGNIZING that rice paddies (flooded and irrigated fields in which rice is grown), a typical agricultural landscape for a significant proportion of world rice cultivation, have provided large areas of open water for centuries in regions with a variety of rice-growing cultures, and, in addition to producing rice, also provide other animal and/or plant food sources and medicinal plants, thus acting as wetland systems and helping to sustain livelihoods and human well-being in these regions;
4. NOTING that rice paddies in many parts of the world support important wetland biodiversity, such as reptiles, amphibians, fish, crustaceans, insects and molluscs, and play a significant role in waterbird flyways and the conservation of waterbird populations;
5. FURTHER RECOGNIZING that aquatic biodiversity associated with rice paddies can make an important contribution to the nutrition, health and well-being of rural populations;
6. RECOGNIZING ALSO that in some particular regions, it is important that irrigated rice paddies remain connected to surrounding natural/semi-natural habitat, in particular to wetlands, for the sake of biodiversity;
7. RECALLING that “rice fields” are included in the Ramsar Classification System for Wetland Type as a human-made wetland (“Type 3 Irrigated land; includes irrigation channels and rice fields”) and thus, where appropriate, may be designated as, or included in, Wetlands of International Importance (Ramsar sites), and that at least 100 designated Ramsar sites around the world include rice field habitats that play important ecological

- roles and support a range of biodiversity, including supporting internationally important populations of breeding and non-breeding resident and migratory waterbirds;
8. NOTING that some sites associated with rice paddies are or could be included in the Globally Important Agricultural Heritage Systems (GIAHS) Programme, which was initiated by the Food and Agriculture Organization of the United Nations (FAO) and promotes the dynamic conservation of areas important for indigenous techniques and cultural and biodiversity values, and RECOGNIZING that such sites could provide examples of wetland wise use;
  9. CONCERNED about current and potential threats to the role of rice paddies as sustainable wetland systems, as well as about the potential and current impacts to the surrounding environment, caused by factors such as inappropriate agricultural practices relating to water management and change of natural flow, as well as introduction of new taxa, including invasive alien species, use of high levels of harmful agricultural chemicals, and the impact of inappropriate conversion of rice paddies to other land uses;
  10. NOTING that some water management approaches, such as flooding of rice paddies when they are not in use for rice production, have been adopted in order to provide suitable habitat for some fauna, including migratory waterbirds, and to control weeds and pest insects;
  11. ALSO CONCERNED that inappropriate conversion of wetland to paddy field may have potential negative impacts on local biodiversity and related ecosystem services, and AFFIRMING that this Resolution is not to be used to justify conversion of existing natural wetlands into human-made wetlands, nor to justify inappropriate conversion of land to human-made wetlands;
  12. ALSO AFFIRMING that the focus of this Resolution is specifically on the maintenance and enhancement of the ecological and cultural role and value of appropriate rice paddies as wetland systems, consistent and in harmony with the Convention, internationally agreed development goals, and other relevant international obligations;
  13. RECALLING that Resolution VIII.34 (2002) highlighted, *inter alia*, the importance of ensuring that agricultural practices are compatible with wetland conservation objectives and that sustainable agriculture supports some important wetland ecosystems, and AWARE of the work currently being undertaken in response to Resolution VIII.34 by the Scientific and Technical Review Panel (STRP) and the Guidance on Agriculture-Wetlands Interactions (GAWI) initiative with the FAO, Wageningen University and Research Centre, the International Water Management Institute (IWMI), Wetland Action, and Wetlands International, including the preparation of a framework for guidance related to interactions between wetlands and agriculture; and
  14. NOTING that information and products related to rice paddy farming are available through the work and publications of the Organization for Economic Cooperation and Development (OECD) on agriculture and biodiversity, including agri-biodiversity indicators; that information on wetland, water and rice farming is available in the Comprehensive Assessment of Water Management in Agriculture (CA); and that the analyses of distribution and representativeness of Ramsar wetland types, currently being