The Biodiversity Strategy of the Ministry of Agriculture, Forestry and Fisheries

Decided in: July 2007;
Revised in: February 2012;
Revised in: March 2023;

The Ministry of Agriculture, Forestry and Fisheries (MAFF)

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I. Introduction

Economic and technological developments since the Industrial Revolution have enabled human beings to lead richer and more convenient lives in material terms while biodiversity is being lost at an unprecedented rate on a global scale. The global environment as a foundation to allow them to survive and continue living in abundance is facing its limits.

Especially, the progress of globalization and consequently extended supply chains have allowed production and consumption to take place far in the distance. As a result, we are unaware that changes in land use, expansion of exploitative farming, and trade and consumption of wild lives are imposing a greater burden on the environment. In addition, any livestock infectious disease, such as swine fever, or any zoonotic disease, such as COVID-19, spreads around the globe with astonishing speed once it breaks out.

Climate change has appeared as another serious threat to biodiversity, posing grave impacts on global food production and agriculture, forestry, and fisheries.

The human community could develop in a sustainable manner only when human activities are kept withing the "planetary boundaries." Especially, we must rethink our way of food production, an activity that takes place only in the conditions of the environment of the earth, including biodiversity, to develop a resilient food system that will benefit the environment, society, and economy as an urgent task of ours.

Lying across a broad range of climatic zones, from subtropical to subarctic, Japan has seen its different regions develop a great variety of agriculture, forestry, and fisheries in a manner adaptable to their own climate and natural conditions, fostering unique, rich biodiversity. Agriculture, forestry, and fisheries are supported by various ecosystem services that biodiversity delivers, such as stable climate, water purification, pollination, natural enemies of pests, soil formation, photosynthesis, and nutrient cycling. A variety of crops we use today are the result of continual improvements exploiting genetic diversity. As an essential activity that connects people to the earth and supplies food and other materials that human beings need to survive, agriculture, forestry, and fisheries have played critical roles not only in developing the economy of local communities and underpinning their culture and landscape but also in reconciling people and the nature and allowing a diversity of species to live and grow.

In Japan, meanwhile, agriculture, forestry, and fisheries are faced with a shortage of human resources with rapidly aging and declining population in rural communities, together with consequent decreases in cultivated area. There is concern that agriculture, forestry, and fisheries may lose their base for production and that rural settlements might be on the verge of extinction. In some regions, agriculture, forestry, and fisheries are actually falling into a decline.

As a response to these biodiversity and global environmental problems, the international community convened the 10th Meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD-COP10) in Japan in October 2010 and made many important decisions regarding agricultural biodiversity. Among them were the Aichi Biodiversity Target and the Strategic Plan for Biodiversity 2011–2020, that are new global targets for 2010 onwards on biodiversity conservation, including the Aichi Biodiversity Targets, and the Nagoya Protocol, arrangements on access to and benefit sharing of genetic resources.

Just before the CBD-COP10, the 5th Meeting of the Parties to the Cartagena Protocol on Biosafety (COP/MOP 5) was held, where the Nagoya - Kuala Lumpur Supplementary Protocol was adopted. At the proposal of Japan, the United Nations General Assembly declared the period 2011-2020 be designated the “United Nations Decade on Biodiversity."

In September 2015, the Sustainable Development Goals (SDGs) were adopted at the United Nations Summit. Then, an idea was presented that targets for natural resources should form the foundation for all other targets, and consequently value of biodiversity became generally recognized as a source of natural capital. Despite this growing recognition, the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), published in May 2019, pointed out that nature's contributions are deteriorating worldwide, that direct and indirect drivers of change have accelerated during the past 50 years, that international targets for conservation and sustainable use of biodiversity are likely to be missed, if things go as they are, and that these targets cannot be achieved without transformative change (that simultaneously addresses the indirect drivers).

In September 2020, the Secretariat of the Convention on Biological Diversity (CBD) published Global Biodiversity Outlook 5 (GBO5). It pointed out that none of the 20 individual Aichi Targets had been fully achieved, and that " Living in Harmony with Nature," the vision for 2050, cannot be achieved without a mix of actions in various fields, including the scaling up of efforts to conserve biodiversity at all levels, effective steps to address pressures driving biodiversity loss, and transformation of ways of production and consumption. Accordingly, the second part of the 15th Meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD-COP15), held in December 2022, adopted the Kunming-Montreal Global Biodiversity Framework, a set of new global targets for biodiversity to be achieved by 2030. The Framework includes 23 targets as urgent actions for conserving and sustainability using biodiversity while providing necessary means of implementation to halt and reverse biodiversity loss and put nature on a path to recovery.

Japan, meanwhile, enacted and amended laws related to these issues, including the Basic Act on Biodiversity (Act No. 58 of 2008) and the Act on the Promotion of Activities for Biodiversity Conservation through the Cooperation among Regional Diversified Actors (Act No. 72 of 2010). Reflecting the Kunming-Montreal Global Biodiversity Framework, adopted in 2022, Japan develops the next National Biodiversity Strategy, which consists of five strategic plans for achieving "Nature Positive by 2030."

In July 2007, the Ministry of Agriculture, Forestry and Fisheries (MAFF) developed the Biodiversity Strategy of the Ministry of Agriculture, Forestry and Fisheries (MAFF Biodiversity Strategy) to place a strong focus on biodiversity conservation in promoting agriculture, forestry, and fisheries. The MAFF Biodiversity Strategy was revised in February 2012 to respond to growing interest in biodiversity and the need for recovery of sustainable agriculture, forestry, and fisheries after the Great East Japan Earthquake.

In May 2021, with the purpose of developing sustainable food systems for the future of agriculture, forestry, and fisheries as well as local communities, the MAFF formulated the MIDORI Strategy, a strategy for sustainable food systems. It provides medium and long-term policy guidelines to enhance both productivity potential and sustainability in food, agriculture, forestry, and fisheries industries by promoting innovation for the reduction of environmental burden, including carbon neutrality by 2050 and the conservation of biodiversity. In May 2022, to secure success of the Strategy, the Act to Promote Low Environmental Impact Business Activities for the Establishment of Environmentally Harmonized Food Systems (Act No. 37 of 2022; aka "Green Food System Act") was enacted.

Given changes in the structure of agriculture in Japan and conditions surrounding the sector, the Ministry has started a discussion for the review of the Basic Act on Food, Agriculture and Rural Areas (Act No. 106 of 1999) almost 20 years after its enactment. Among the key issues for the discussion are the problem of global environment, including biodiversity conservation, together with the growing risk of food security.

Biodiversity serves as the foundation on which a sustainable society is built and the base on which the food industry and agriculture, forestry, and fisheries rely. Regarding the current state in and out of Japan described above, the MAFF Biodiversity Strategy is revised in a manner that it will help reconcile people and nature and realize a sustainable society that will hold itself withing the planetary boundaries. The revised Strategy should place the focus specifically on the relation between the food industry and agriculture, forestry, and fisheries, and biodiversity.

The Strategy is designed to: reverse the loss of natural capital, which underpins the food industry and agriculture, forestry, and fisheries; facilitate the mainstreaming of biodiversity (that is, lead a broad range of actors, such as the central and local governments, businesses, NPOs and NGOs, and the general public, to recognize how important conservation and sustainable use of biodiversity is, and act accordingly); make ecosystem services visible and integrate value of biodiversity into finance for developing ESG finance; and establish a new system of technology and further develop innovations while applying traditional wisdom of agriculture, forestry and fisheries in Japan; for achieving at the same time greater productivity and sustainability of agriculture, forestry, and fisheries. Taking the global trend into account, the Strategy is also intended to perform as a framework for biodiversity conservation in the Asian monsoon region, as it is different from western countries in climate conditions and the production structure.

The Strategy sets out challenges Japan should address in terms of biodiversity in agriculture, forestry, and fisheries and the direction of policies the MAFF should pursue over the next ten years or so, while presenting specific policy programs to be implemented over the next five years. The Strategy may be modified on an as-needed basis.

II. Current state of things and challenges to address

(1) Significance of biodiversity as a foundation for agriculture, forestry, and fisheries

Farmland, forests, and the ocean provide us with what we cannot do away with in living, such as rice, vegetables, fish, meat, lumber for houses we live in, and fibers as raw material for clothing and other daily goods. Most of the industries depend on natural capital, including biodiversity. For instance, the World Economic Forum estimates more than half of the global GDP relies on benefits delivered by nature.

Especially, agriculture, forestry, and fisheries act on nature adaptively, not adversely, using it ingeniously and facilitating the circulation of materials to receive benefits it grants. The sector can go on only when biodiversity is kept sound.

Crops and livestock have been developed through improvement of varieties with various features brought about as part of biodiversity. These varieties have enabled agriculture, forestry, and fisheries to deliver stable production. Ecosystem services which agriculture, forestry, and fisheries cannot do away with, such as soil and hydrological circulation, are provided by various ecosystems and organisms living there. Some of the ecosystem services directly benefit agriculture, forestry, and fisheries as natural enemies of pests, and pollinators and decomposers.

We also benefit from biodiversity in our everyday life as we go into the mountains to pick edible wild plants in spring, enjoy the fresh green of early summer, and go out to see scarlet leaves or pick mushrooms in autumn, feeling changes of the four seasons and spending life with a plentiful diet.

Conservation of biodiversity has much to do with the fight against climate change, as well. For instance, the GBO5 points out that around one-third of the net reductions in greenhouse gas emissions required to meet the Paris Agreement's goals could come from 'nature-based solutions.' The Aichi Biodiversity Targets are reflected by the SDGs in many points, and are included as important elements in conservation of the marine resources (Goal 14) and sustainable management of forests (Goal 15), as well as achievement of food security (Goal 2), and availability of safe water (Goal 6).

(2) Current state of biodiversity

(Current state of biodiversity around the world)

The GBO5 points out that biodiversity is declining at an unprecedented rate, and the pressures driving this decline are intensifying. It also states that nearly one-quarter (23.7%) of species are threatened with extinction unless the drivers of biodiversity loss are drastically reduced, with an estimated total of one million threatened species across all groups, and that wild animal populations have fallen by more than two-thirds since 1970, and have continued to decline since 2010. Forests, home to 60,000 tree species which provide habitat for 80% of amphibians, 75% of birds, and 68% of mammals, are being converted in use at an annual rate of 10 million hectares, although at a slower pace than before.

These global trends of biodiversity are expected to make significant impact on stability of food supply and agriculture, forestry, and fisheries. For instance, plants dependent on pollinators, such as bees, are responsible for 35% of global crop production, or an estimated annual market value of 235 to 577 billion US dollars (as of 2015) only among those directly affected. Among these crops are fruits, vegetables, seeds, nuts, and oil crops, which supply most of the micronutrients, vitamins, and minerals people consume.

The fishery output of fishing boats has been leveling off since the late 1980s. However, some point out that one-third of the marine fishery resources are in a state of overfishing, which, together with factors such as changes in fishing grounds due to climate change, has raised concerns about its possible impact on catches in the future.

(Current state of biodiversity in Japan)

Japan provides a great variety of animals and plants with their habitats in a small area of land as it lies long from north to south across many climate zones, including some alpine zones up to forest limit, with four distinct seasons, surrounded by the sea, covered with forests in 67% of the soil, and dotted with rice paddies that help maintain wetland ecosystems. Japan also sees that its rapidly aging and declining population, amid a growing number of people around the globe, poses unique problems for the country in terms of biodiversity.

In Japan, the secondary nature, formed through agriculture, forestry and fisheries, has provided a diversity of animals and plants with habitats through its history, as typically seen in "Satochi-Satoyama." natural woodlands or regions used commonly by local communities for their livelihoods. In recent years, however, the aging of the population and the consequent shortage of human resources leave some farmland abandoned and forests in poor management, that causes the loss of diversity of habitats formed and maintained by people there. With the decline in engagement of people with the nature, such as management and use of "Satochi-Satoyama," the population of wild pigs, deers, and other larger mammals has increased, which causes greater harm than ever to the livelihoods of people and their farm produce. Some invasive alien species, such as raccoons, are already difficult to prevent from spreading in the country. With the economic and social globalization, red imported fire ants, red-necked longhorns, and other Invasive alien species have unexpectedly gained entry into Japan.

Japan's climate - rather warm, rainy, and humid - is favorable for pests and weeds. The heavy burden of pest control and weeding is pointed out as one of the characteristics of its agriculture sector. Wisdom and innovation are needed to enable people to protect the habitats for a diversity of living creatures while leading their lives and earning their livelihoods in harmony with them.

In coastal and seashore ecosystems, tidal flats and seaweed beds are shrinking. Corals are shrinking in size and degrading in quality due to bleaching. In 2016, the Sekisei Lagoon, Okinawa Prefecture, suffered a drastic decrease of coral amid large-scale bleaching. Fisheries and marine resources in Japanese waters also face difficult problems. A resource evaluation performed on a maximum sustainable yield (MSY) basis found that the amount of resource lay below the MSY level for 69% of the fish species evaluated. Another evaluation of the levels and trends of the resources revealed that 56% of the fish species evaluated stood at a low level. A variety of factors are pointed out for the results, including changes in the marine environment, such as water temperature, decreases of seaweed beds and tidal flats as a spawning and breeding places due to development of coastal areas, and fish catches above the replenishment rate for some resources.

(3) Significance of rural communities facilitating biodiversity and ecosystem services and challenges they face

In Japan, agricultural, forestry, and fishing, or rural, communities facilitate biodiversity, supplying food and other necessities of life, such as water, fiber, and lumber, as well as offering places for spiritual and cultural richness, such as recreation and artistic creativity. Appropriate management of forests helps conserve biodiversity, mitigate climate change, control flood damage, and purify water, underpinning the safety of our daily lives.

Rural communities have formed distinctive landscapes and natural environments, and have served as a cradle for ecosystem services in the fields of culture and disaster control and reduction. Now, however, they are faced with difficult challenges, such as depopulation and decreases of workforce and successors. Based on its own analysis, the Policy Research Institute of Agriculture, Forestry and Fisheries (PRIMAFF) estimates that the number of settlements facing the threat of their existence will increase more than fourfold from 2000 in 2015 to 10,000 in 2045, and that 90% of them will be found in hilly and mountainous areas.

Agriculture, forestry, and fishery can be kept sustainable and allowed to conserve biodiversity and perform multifunctionality only with revitalization of rural communities. For that purpose, all the measures feasible must be deployed, including the securing of human capital for agriculture, forestry, and fisheries, as well as facilitation of greater variety in ways of work, efforts to expand concerned population, and effective application of new technologies and services. Especially, hilly and mountainous areas provide habitats for various organisms. Agricultural management in diverse manners - not only large-scale farming but also small-scale, family, and part-time agriculture, major styles of farming in hilly and mountainous areas - should be maintained, which is also critical from the viewpoint of biodiversity conservation.

As stated above, ecosystem services facilitated by rural communities, such as conservation of water resources and prevention of soil erosion, reduce risks of natural disasters, including storms and floods. They play critical roles in preservation of the national land and control and reduction of damage of disasters. They also supply water and energy we need in life and deliver cultural value by offering places for rest and relaxation and helping develop culture. Sustainable agriculture, forestry, and fisheries must be maintained and developed because they are essential in building a future that allows people to feel safety, security, and affluence personally. Common understanding of their importance should be raised among the whole nation.

(4) Positive and negative impacts of agriculture, forestry, and fisheries

(Positive impacts of agriculture, forestry, and fisheries)

Rice paddies, accounting for most of the arable land in Japan, maintain a unique ecosystem and provide habitat for various organisms. The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) classifies rice paddies as wetlands. A report states that 6,305 species have been found in rice paddies in Japan.

Conservation and management of grassland by people in the form of mowing and burning in the field helps preserve habitats of various plants and animals, including rare species, as secondary nature in a stable manner in some cases.

Planted forests, as well as "satoyama" forests, used to gather firewood, produce charcoal, and collect grass, also provide many living creatures with habitats and pathways for migration. At some seaweed beds and tidal flats, bedrocks are scrubbed or the sands are tilled, a practice that helps improve living environments for the marine life there and recover productivity of fisheries resources, facilitating ecosystem rehabilitation. As seen in these cases, agriculture, forestry, and fisheries have roles to play in providing a variety of animals and plants with a base allowing them to live and grow in rural communities. They have been rated as what helps conserve biodiversity.

(Negative impacts of agriculture, forestry, and fisheries)

However, agriculture, forestry, and fisheries may have a negative impact on biodiversity, depending on how they are practiced.

Among the specific alarming practices are ways of improving farmland and/or canals that give precedence to economics and efficiency; excessive application of pesticides and /or fertilizer; poor care of "satoyama" forests that may attract pests and/or noxious wildlife; discharge of domestic waste water that may cause pollution and/or reclamation that should shrink seaweed beds and/or tidal flats; and overfishing and/or aquaculture that may pollute water and/or use of antibiotics that may generate resistant bacteria. In fact, crops and grass introduced from overseas have played important roles in allowing people to live an affluent life. However, there are concerns about their escape into a natural ecosystem in some cases. Such activities of human beings, with little consideration for biodiversity, have degraded habitats for living creatures, making a significant impact on the biodiversity of Japan. At the United Nations Food Systems Summit, held in September 2021, it was pointed out that food systems were contributing to up to 80% of global biodiversity loss. Around the globe, attention is paid to impacts of agriculture, forestry, and fisheries on biodiversity.

As described above, rural communities and agriculture, forestry, and fisheries are closely related with biodiversity. Agriculture, forestry, and fisheries are dependent on biodiversity, while biodiversity is largely maintained by the sector.

An important viewpoint for keeping agriculture, forestry, and fisheries sustainable into the future and capable of supplying rich ecosystem services to society is that the positive impacts of agriculture, forestry, and fisheries on the ecosystem must be facilitated and the negative impacts must be reduced to create a virtuous cycle between the environment and the economy. Efforts to achieve this goal must be made, with the understanding of consumers, over the entire supply chain, including distributors as well as producers.

(5) Challenges the entire supply chain should address for biodiversity

With the diversification of diet and the liberalization of imports of agricultural, forestry, and fishery products, Japan sees its supply chains increasingly globalized. In FY2021, food self-sufficient ratio on a calorie basis is 38%. The self-sufficient ratio of wood and feed stood at 41.1% (2021) and 25% (preliminary for FY2021), respectively. Japan imported 100% of ammonium phosphate and potassium chloride, and 96% of urea, materials underpinning agriculture production as they are used to produce chemical fertilizer (between July 2020 and June 2021). As shown here, Japan is largely dependent on foreign countries for agricultural, forestry, and fisheries products and materials for production. Behaviors of Japanese consumers, in turn, make impacts on biodiversity in places of production overseas.

Looking at the world, it is turned out that 30% (1.4 billion hectares) of the global farmland area is used in vain to produce food that is not consumed. It is pointed out that monoculture and expansion of farming into wildlife areas unreasonably intensify negative impact that may contribute to the loss of biodiversity, such as diversity of mammals, birds, fish, and amphibians.

Plastic waste, discharged at production sites, as well as in the process of distribution and consumption, makes a negative impact on habitats of living organisms. A typical example can be found in the problem of marine plastic waste. In the food industry and agriculture, forestry, and fisheries, chemical resin products are used for agricultural materials, packages, and containers. Especially, consumption of packages and containers is growing. How these materials can be reduced, reused, recycled, and/or made renewable is one of the latest challenges to be addressed.

Since the adoption of the Aichi Biodiversity Targets at the CBD-COP10, awareness of biodiversity has also been growing rapidly in Japan, especially among businesses. Nevertheless, the progress towards the achievement of the Targets, whose target year was set at 2020, is less than satisfactory for Japan, as well as for the entire global community. Behind the result, as the GBO5 pointed out, lie indirect drives of biodiversity loss, such as unsustainable patterns of production and consumption and the global population growth. A shift away from "business as usual" across a broad range of human activities and transformation of the society is required. "The Future of Nature and Business," a report published in 2020 by the World Economic Forum, states that transitions in economic systems threatening biodiversity towards "nature positive" could deliver 10.1 trillion US dollars of business value and 395 million jobs by 2030.

What should become important to further mainstream biodiversity in agriculture, forestry, and fisheries, and to build a virtuous cycle between the environment and the economy, transformation of behaviors among actors, especially producers, consumers, and businesses. A key for the success lies in choices of consumers. That means that initiatives for facilitating biodiversity conservation in agriculture, forestry, and fisheries must be carried out with an eye to the entire supply chain, not only at the sites of production but also at those of distribution and consumption, including those overseas.

Given the growth of ESG finance around the globe and the progress of actions towards disclosure of nature-related financial information, including biodiversity, roles of financial institutions should be recognized to build close cooperation with them, so that actions of businesses and other actors can be led and accelerated. Cooperation with NPOs and research institutions, among others, should also be promoted to help players of supply chains transform their behaviors at scenes of production, processing, distribution, and consumption on the side of policy, financing, human resources, and know-how.

As mentioned above, measures for biodiversity conservation have much to do with the fight against climate change. For example, proper management and conservation of forests should make a positive impact on both biodiversity and climate change. However, some effort to mitigate climate change, such as installation of solar panels on an area of land prepared after a large-scale deforestation, may have a negative impact on biodiversity. Taking into consideration such relationships, efforts must be made to pursue measures to conserve biodiversity in coordination with fight against climate change by, for instance, eliminating trade-offs and/or expanding synergies between them.

Kunming-Montreal Global Biodiversity Framework

The CBD-COP15, having been scheduled to discuss a new global target as a successor to the Aichi Targets, was postponed due to the spread of COVID-19, before its First Part was held in Kunming, China, in October 2021, where the convention adopted the "Kunming Declaration," which expressed a resolution to halt biodiversity loss. The Second Part, held in Montreal, Canada, in December 2022, adopted the Kunming-Montreal Global Biodiversity Framework, a new set of global targets for biodiversity, with a target year set at 2030.

The Framework carries 23 targets that should be achieved by 2030. As it relates to agriculture, forestry, and fisheries, it requires ensuring that at least 30 per cent of terrestrial and inland water areas and of marine and coastal areas are effectively conserved and managed through the system of protected areas and other effective area-based conservation measures (OECMs) by 2030 (30 by 30); and reducing excessive nutrients lost to the environment and pollution risks from chemicals. It also includes targets for sustainable management of areas under agriculture, aquaculture, fisheries, and forestry.

III. 2030 Vision and its basic policies

1. 2030 Vision

A society in which the environment and the economy circulate and improve, taking advantage of the natural blessings nurtured in rural areas

2. Basic policies

(1) Conserve biodiversity and ecosystem services in rural areas

In Japan, rural (agricultural, forestry, and fisheries) communities have nurtured a variety of organisms through the practice of agriculture, forestry, and fisheries, forming a diversity of unique ecosystems, which have in turn developed their own features (localities), such as landscape, food culture, and traditional culture. Biodiversity serves local communities as a source of their wealth. Through their practice, those engaged in agriculture, forestry, and fisheries produce their products while playing important roles in conserving biodiversity and delivering a variety of ecosystem services. However, rural communities see their biodiversity being lost due to the lack of human intervention in the ecosystem amid the shortage of labor force in agriculture, forestry, and fisheries with the aging and shrinking population.

Rural communities must be supported in performing their roles. Those engaged in agriculture, forestry, and fisheries, regardless of their scale or type of business - whether operating on a large or small scale or whether as a family or part-time business - must be encouraged to pursue agriculture, forestry, and fisheries operated in harmony with the environment, so that rich biodiversity in rural communities in Japan and ecosystem services it delivers will be conserved.

(2) Reduce the impacts of agriculture, forestry, and fisheries on the global environment and contribute to its conservation

Agriculture, forestry, and fisheries are dependent on the global environment, including biodiversity. At the same time, they are a major tie binding human beings and the Earth, or an industry acting directly on natural capital. Practices of agriculture, forestry, and fisheries are significant not only to challenges concerning biodiversity and climate change but also to other fundamentals of SDGs.

With the growing global population, stable supply of food and conservation of the global environment can be achieved at the same time only when synergies between measures to address diverse problems are maximized while trade-offs between them are minimized based on scientific evidence to reduce environmental burden in the fields of food production and agriculture, forestry, and fisheries and conserve biodiversity and ecosystem services. Through its related policy programs, the MAFF Biodiversity Strategy encourages the national and local governments, as well as the actors in the supply chains, to better understand biodiversity and transform their behaviors for achieving "nature positive" and addressing challenges of the global environment in a unified manner.

Nature Positive

The commitment to achieving a society for living in harmony with nature by 2050 requires halting and reversing biodiversity loss to put nature on a path to recovery by 2030.

The 2030 Nature Compact, agreed at the G7 Summit in 2021, declared a commitment to "halt and reverse biodiversity loss by 2030."

The Kunming-Montreal Global Biodiversity Framework also states "To take urgent action to halt and reverse biodiversity loss to put nature on a path to recovery" as its 2030 Mission.

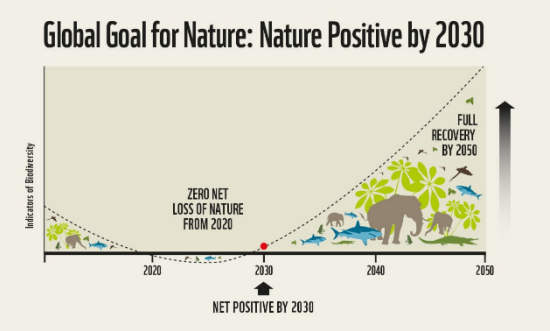


Figure: https://www.naturepositive.org

(3) Make efforts throughout the supply chain

All actors throughout the supply chain, from upstream to downstream, not only those working on the sites of agriculture, forestry, and fisheries but also those engaged in processing and distribution, consumption, and disposal and recycling, must be encouraged to act in cooperation for reducing environmental load and to conserve biodiversity and ecosystem services.

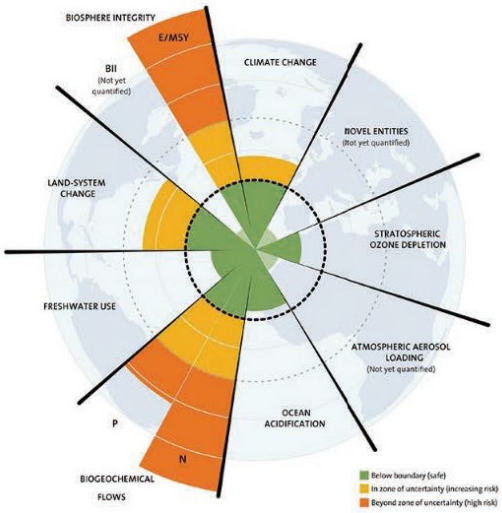
In terms of the "planetary boundaries," or limits of the earth, it is believed that the loss of biodiversity has passed the critical point. A critical look is also directed at food production and agriculture, forestry, and fisheries, sectors that exploit natural capital. With a spread of the ideals of SDGs and ESG, greater effort is being made to study approaches to greening from the financial side. Businesses could not raise funds in a stable manner, especially from institutional investors with their confidence, unless, as urgent challenges they must address for their sustainable growth, they evaluate and analyze what impact natural capital-related risks and opportunities will make on their financial conditions, integrate into their management policy reduction of the burden they may impose on the environment all through their supply chains, and disclose information of their initiatives. In addition to the Task Force on Climate-related Financial Disclosures (TCFD), the Taskforce on Nature-related Financial Disclosures (TNFD) was formally established in 2021. What is important for development of food production and agriculture, forestry, and fisheries into the future is effort throughout the supply chain to conserve biodiversity and make the entire food system more sustainable. Given that all actors are required to address these challenges proactively, the MAFF will also support these initiatives under the MIDORI Strategy. It is also expected that an improved sustainability of Japan's food system as a whole will enhance the reputation of its agricultural, forestry, and fishery products, helping promote their export.

Planetary Boundaries

When a set of elements representing changes of earth stay within a range that allows human beings to act safely, the human community can continue to develop and thrive. Once it should be surpassed, natural capital that they depend on will undergo irrevocable changes.

Among the nine environmental elements, the rate of species extinctions and the cycle of nitrogen and phosphorus have gone beyond the zone of uncertainty into that of high risk. Climate and land use changes have reached the zone of uncertainty; i.e., increasing risk.

Source: Adapted by the Ministry of Environment from Stockholm Resilience Centre (illustrated by Johan Rockström and Pavan Sukhdev, 2016)



(4) Promote understanding of biodiversity and behavioral change

Choices made by people in their daily lives, including buying behaviors, as well as actions at the sites of food production and agriculture, forestry, and fisheries, have influence on the burden laid on the environment throughout the supply chain. By extension, they have much to do with increases and decreases in biodiversity and ecosystem services.

Especially, it must be recognized that as Japan is dependent on imports for most of its food and other agricultural, forestry, and fisheries products, as well as fertilizer, feed, and other production materials, choices made day-to-day by consumers of the country have a significant impact on increases and decreases in biodiversity and ecosystem services along the supply chain, including sites of production in foreign countries.

Actors of the supply chains must be encouraged to use environmental-friendly materials and/or keep consumers informed for facilitating their understanding of biodiversity and transformation of behaviors. It is also expected that opportunities will be offered to understand and come in contact with nature through school education, experience of agriculture, forestry, and fisheries, and dietary education, among others, so that consumers and others will have better understanding, that the entire nation, not only those engaged in agriculture, forestry, and fisheries, will become aware of roles they have to conserve biodiversity, that choices of goods and demand for services will change, and that the supply side, or those

working on-site for food production and agriculture, forestry, and fisheries, will be encouraged to have better understanding and transform their behaviors.

(5) Pursue the greening of policy approaches

With interest growing in SDGs and the environment, food production and agriculture, forestry, and fisheries of Japan should also be transformed to harmonize with the environment and achieve greater productivity and sustainability at the same time. To facilitate this trend, the MAFF will also pursue the greening of its policy approaches.

Especially, given that projects carried out directly by the MAFF or with its subsidies have significant impact on how much burden food production and agriculture, forestry, and fisheries may impose on the environment at their sites, the Ministry will secure and develop talent who will work in the sectors from the viewpoint of biodiversity and ecosystem services conservation. The Ministry will also incorporate into its projects the viewpoint of biodiversity and ecosystem services conservation by, for instance, helping implement in society tools for smart agriculture, forestry, and fisheries, such as robotics, AI, and IoT, to enhance productivity and reduce environmental load at the same time. The MAFF will also pursue the greening of its policy approaches, with the expectation that the initiative will encourage actors of the supply chain to better understand biodiversity and transform their behaviors.

(6) Strengthen the implementation system

Those engaged in agriculture, forestry, and fisheries and small and medium-sized enterprises (SMEs), as well as local financial institutions supporting them, have great significance in conservation of biodiversity in rural communities and sustainable use of ecosystem services there. Large enterprises and institutional investors supporting them, as well as consumers, through their day-to-day choices, also have great influence for the prevention of further loss of biodiversity on a global scale. These actors should be encouraged to transform their behaviors, becoming more aware of biodiversity and ecosystem services.

For encouraging actors to effectively apply the MAFF Strategy to make the environment and the economy consistent, the MAFF will work with those engaged in agriculture, forestry, and fisheries, as well as relevant ministries and agencies, local governments, private-sector businesses, financial institutions, NPOs, research institutions, and other parties concerned, and develop a base on which they all can work together.

The Ministry will also enhance its system in a manner such that projects designed under the MAFF Strategy will be carried out in coordination with its other policy programs. In addition, the MAFF leads its local organizations, such as Regional Agricultural Administration Offices, to cooperate with actors working on-site in rural communities for helping the MAFF Strategy exercise greater affect there.

IV. Thematic Policies

(In this chapter, related targets of the Kunming-Montreal Global Biodiversity Framework are mentioned.)

1. Contribution of the agriculture, forestry and fisheries sectors to global environmental conservation

Greater dependence of agriculture, forestry, and fisheries on biodiversity among the industrial sectors implies in turn possibly larger contribution that the three sectors, as well as rural communities, may make towards its conservation. Parties concerned must understand the possibilities and take the lead in making contributions to conservation of the global environment.

Around the globe, initiatives for biodiversity conservation are becoming increasingly active. In May 2021, Japan announced its participation in the Leaders' Pledge for Nature, where political leaders committed to becoming united to halt and reverse biodiversity loss by 2030 for sustainable development.

At the G7 Summit held in June that year, to make the Pledge come true, the leaders declared the G7 2030 Nature Compact, where they committed to "tackle these interdependent and mutually reinforcing crises (of biodiversity loss and climate change) in an integrated manner, thereby contributing to the achievement of the Sustainable Development Goals and a green, inclusive, and resilient recovery from COVID-19."
At the United Nations Food Systems Summit, held in 2021, pointing out the importance of achieving greater productivity and sustainability at the same time, and taking into account climate, natural features, and dietary culture of countries when selecting approaches to the issues, Japan declared the pursuit of its MIDORI Strategy.

For making contribution to these initiatives and passing "food and diet" which should support life and the "environment" which should guarantee safety and security in life down to children in the future, the MAFF will address environmental problems, including conservation of biodiversity and fight against climate change, in a united manner and work with a variety of actors in and outside of Japan to find solutions and realize the 2030 vision.

(1) Aim to solve a set of global environment problems at once

The SDGs consist of 17 goals and 169 targets which countries around the globe agree for solving problems the world faces and building a sustainable society. When the 17 goals stratified into layers, natural capital forms the basis on which the other goals stand. Human beings maintain a society by making the best of what natural capital delivers. Food production and agriculture, forestry, and fisheries especially depend on natural capital, such as land, water, and biological resources. The sectors can develop sustainably only when natural capital is conserved and recovered while at the same time being used in a sustainable manner.

In view of the global population that will continue growing, Japan, dependent on imports for most of the food and feed materials it consumes, must prepare food security policies, taking into consideration stable supply and sustainable procurement of agricultural produce not solely for Japan but for the entire world.
Coming up with a virtuous cycle of the economy and the environment as a pillar of its growth strategy, the government of Japan has declared that the greatest resources available will be devoted for realizing a green society with a view to achieving carbon neutrality by 2050. The food production and agriculture, forestry, and fisheries sectors must also work actively to make contributions to the initiatives.

The "planetary boundaries," or limits of the earth, consist of nine elements, four of which - climate change, biodiversity, land-use change, and the flows of nitrogen and phosphorus - have already been surpassed. It is believed that the balance of the ecosystem will shift irrevocably, setting off a chain of negative phenomena. Urgent and bold actions are required now.

As a response to the current state and challenges described above, the MAFF formulated the MIDORI Strategy in May 2021 to develop a sustainable food system and take the initiative in and outside of Japan.

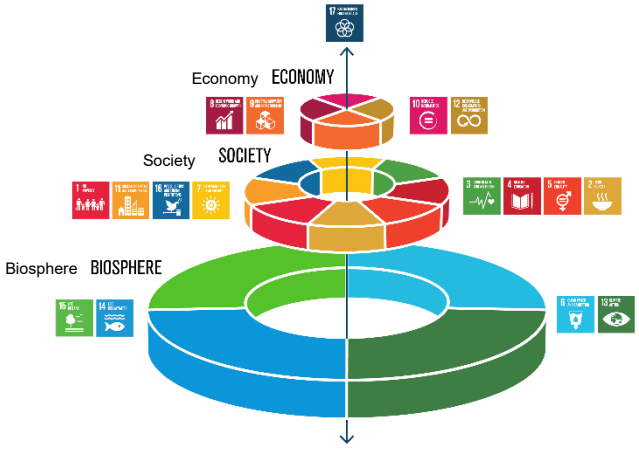
To solve a set of challenges concerning the global environment at once, international cooperation must be promoted for sustainable agriculture, forestry, and fisheries. Experts from Japan must be encouraged to participate in conventions on biodiversity and climate change, such as meetings of the conferences of parties (COP) of the Convention of Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCC), and those of the IPBES and the Intergovernmental Panel on Climate Change (IPCC). The MAFF will also actively participate in international discussions. Together with the national and local governments, actors in the supply chains must be encouraged to address

challenges of the global environment in a united manner. These initiatives must be designed to make active contributions to conservation of biodiversity, as well as that of the global environment, including prevention of desertification, sustainable use of water resources, and adaptation to, and mitigation of climate change.

SDGs Wedding Cake

When the 17 goals of SDGs are stratified into layers, natural capital forms the basis on which the other goals stand. Human beings maintain a society by making the best of what natural capital delivers. Without keeping natural capital sustainable, the other goals cannot be achieved.

Source: Stockholm Resilience Centre (illustrated by Johan Rockström and Pavan Sukhdev, 2016)



(2) Climate change and biodiversity (Targets 8 & 11)

Among the 17 goals of the SDGs, closely related with each other, climate change and biodiversity are in especially close connection.

The Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPPC) (February 2022) shows risks of climate change leading to loss of ecosystems, biodiversity, and ecosystem functions and services. The IPCC Special Report on Climate Change and Land (August 2019) states that climate change creates additional stresses on land, exacerbating existing risks to biodiversity. The IPCC Special Report on the Ocean and Cryosphere in Climate Change (September 2019) demonstrates impact of ocean warming observed so far on biodiversity and ecosystem services in coastal areas.

Biodiversity, in turn, has impact on climate, as it affects the cycles of nitrogen, carbon, and water.

Given that climate change and biodiversity affect each other, as stated above, challenges concerning the issues must be addressed in an integrated manner. However, many of the current policy measures are implemented on a stand-alone basis, without any consideration for synergy or trade-off between them.

According to IPBES-IPCC Co-Sponsored Workshop On Biodiversity And Climate Change workshop report, published jointly by experts from the two organizations, some of the measures for climate change adaptation and/or mitigation, such as use of large areas of land for renewable energy production, monoculture over a large area of land for bioenergy crops, and afforestation in ecosystems that have not historically been forests, may have negative impact on biodiversity and/or ecosystem services. It also states, on the other hand, that some solutions, such as those for prevention of loss and/or degradation of land and marine ecosystems, practice of sustainable agriculture and forestry, and reduction of food loss and/or waste, may provide co-benefits for both biodiversity and climate change.

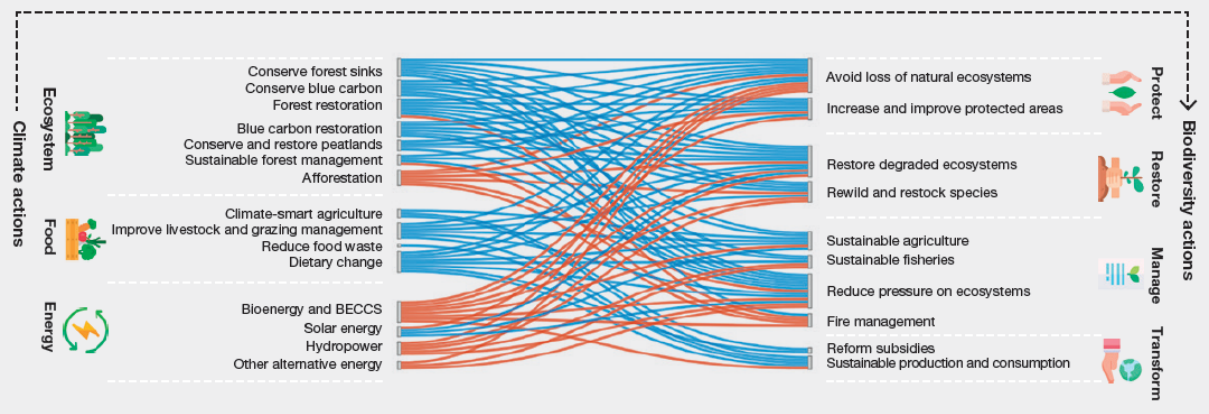
The Sharm el-Sheikh Implementation Plan, decided at the plenary meeting of the 27th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC-COP27), held in November 2022 in Sharm el-Sheikh, Egypt, underlines at the beginning the urgent need to address, in a comprehensive and synergetic manner, the interlinked global crises of climate change and biodiversity loss, and emphasizes the importance of protecting, conserving, and restoring nature and ecosystems to achieve the Paris Agreement temperature goal, including through forests and other terrestrial and marine ecosystems acting as sinks and reservoirs of greenhouse gases and by protecting biodiversity, while encouraging Parties to consider, as appropriate, nature-based solutions or ecosystem-based approaches for their mitigation and adaptation action.

As one of its targets, the Kunming-Montreal Global Biodiversity Framework also states minimizing the impact of climate change on biodiversity mainly through mitigation and adaptation actions, including through nature-based solution and/or ecosystem-based approaches.

In policy measures implemented for agriculture, forestry, and fisheries, challenges in climate change biodiversity should not be addressed separately. Instead, policy measures for adaptation to, and mitigation of, climate change should be carried out while examining whether biodiversity is taken into consideration, so that initiatives for solving the two problems will be pursued with attention paid to synergies and trade-offs between them to contribute to achievement of the SDGs.

Effects of actions to mitigate climate change on those to conserve biodiversity

The blue and orange lines represent positive and negative effects, or synergies and trade-offs, respectively. Some of the solutions are in the pilot and/or ideation phase, and interactions between them may change, depending on future developments.



Source: IPBES and IPCC (2021). The Scientific Outcomes of the IPBES-IPCC co-sponsored workshop on biodiversity and climate change, Figure 7-2 (p.152)

(3) Contributions to global conservation and recovery of forest ecosystems (Targets 15, 20, and 21)

Forests contribute to both mitigation of and adaptation to climate change as they provide a diversity of living creatures with habitats as well as absorb and store carbon dioxide and prevent natural disasters in mountainous areas.

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Faced with population growth and poverty, however, developing countries are compelled to engage in farmland development with large-scale deforestation and/or resource-exploiting agricultural production for obtaining more production and generating more income. The State of the World's Forests 2020, published by the Food and Agriculture Organization (FAO) of the United States, shows that conversion of forests to farmland and others, illegal logging, and wildfires, among others, still present challenges, and that in the tropical and subtropical regions, farmland development is responsible for more than 70% of the deforestation. As a result, loss and degradation of forests, especially tropical forests, which provide habitats to a tremendous number of species on the earth, continue around the globe. According to the Global Forest Resources Assessment (FRA) 2020, deforestation occurred at a rate of more than 11 million hectares per year between 2010 and 2020 (4.7 million hectares when offset against increases from afforestation, etc.) Deforestation and forest degradation on such a large scale causes loss of biodiversity on a global scale, and presents one of the main factors that increase the risk of sources of carbon dioxide emissions and occurrence of disasters of landslide and mudflow.

Developing countries constitute major producers of agricultural and forestry products. Developed countries, importers and consumers of the products, are required to promote cooperation for forest conservation and afforestation in developing regions and participate actively in international dialogs for

cooperating with producers and contributing to facilitation of sustainability of global markets, including those for agriculture and forestry products. Efforts must also be made to achieve the United Nations Strategic Plan for Forests 2017-2030, which defines contributions to international commitments related to forests, such as those under the Convention on Biological Diversity, and the Plan's international targets for forests. At the UNFCCC-COP26, the World Leaders Summit 'Action on Forests and Land Use' was held, and leaders have committed the Glasgow Leaders' Declaration on Forests and Land Use and other declarations to halt and reverse forest loss. To follow up the declarations, the Forest and Climate Leaders' Partnership (FCLP) was launched at the next UNFCCC-COP27.

To address these significant global-scale challenges, efforts must be made for contribution to the United Nations Forum on Forests (UNFF) and other institutions and standards and indicators through the Montreal Process. Technical and financial assistance, establishment of legal and sustainable wood supply chains, as well as bilateral cooperation for enhancing resilience of mountainous watersheds through development and conservation of forests and multilateral support through international organizations, such as the International Tropical Timber Organization (ITTO) and FAO, must be provided. Especially, as the ITTO has closed a memorandum of understanding (MOU) with the CBD secretariat for biodiversity conservation, continued support must be provided to the ITTO for its projects for sustainable forest management, including conservation of biodiversity. Support must also be provided for developing countries to encourage them to reduce emissions from deforestation and forest degradation (REDD) and/or develop technologies and human resources helpful to enhance disaster control and reduction functions of forests and facilitate control of deforestation and forest degradation and sustainable management of forests.

Study must be carried out in cooperation with a diversity of actors on sustainable ways of procurement consistent with conservation of forest ecosystems around the globe, and on ways to make visible initiatives pursued by producers on the ground for biodiversity conservation for facilitating understanding of consumers and creating demand for environment-friendly food and agricultural, forestry, and fisheries produce.

Through these policy measures, efforts must be made internationally to promote environment conservation and sustainable forest management for contributing to conservation of biodiversity on a global scale and to practice of responsible agriculture and better conservation and protection of forests and other important ecosystems.

The World Leaders Summit 'Action on Forests and Land Use': Overview

In November 2021, during the UNFCCC-COP26, The World Leaders Summit 'Action on Forests and Land Use' was held under the initiative of the chair, the United Kingdom, to give momentum to control of deforestation and recovery of forests. Japan participated in the four declarations, among others, published as deliverables of the event.

(i) Glasgow Leaders' Declaration on Forests and Land Use:
The signatories commit to working to halt and reverse forest loss by 2030. More than 140 countries have signed the Declaration so far.

(ii) Global Forest Finance Pledge
To achieve the targets of the Glasgow Leaders' Declaration, 12 countries and regions committed to collectively securing 12 billion US dollars of public finance over the coming five years.

(iii) COP26 Congo Basin Joint Donor Statement: Supporting the protection and sustainable management of the Congo Basin forests
Twelve countries, regions, and organizations pledged to finance 1.5 billion US dollars for protection of forests in the Congo Basin, Africa.

(iv) Joint statement on principles for collaboration under the Forest, Agriculture and Commodity Trade (FACT) Dialogue
The signatories declared that they would work together to encourage cooperation for building sustainable supply chains for agricultural commodities without loss of forests. So far, 28 countries and regions have signed the Statement.

(AS of January, 2022)

2. Mainstreaming biodiversity throughout the supply chain

In Japan, where paddy field farming has been practiced since the Jomon period about 2,500 years ago, there are a variety of living creatures with a life history that is adapted to the cultivation calendar of paddy rice in line with the four seasons. They are living and growing while they relate to each other to form the ecosystem of paddy fields where species endemic to Japan are also living and growing. In this way, production sites of agriculture, forestry, and fisheries, which are secondary nature, have formed a distinctive ecosystem that adapts to climates and topographies specific to each area and nurtures organisms including endemic species, and their land area is overwhelmingly larger than that of protected areas. As indicated in the Satoyama Initiative, in order that biodiversity can be conserved while the sustainable use of regional resources is ensured, and that a positive cycle between the environment and the economy can be maintained, it is necessary to make sustained efforts at production sites in agriculture, forestry, and fisheries with secondary nature.

However, it has become evident that efforts to directly change agriculture, forestry, and fisheries and the lifestyles of people at production sites alone will not stop the rapid loss of biodiversity, and it has been pointed out that social reform, including food systems, is needed. Moreover, the physical distance between consuming and producing areas, such as between consuming and producing countries, and between cities and rural areas/communities, has become too far for consumers to grasp the situation of producing areas, which has also been pointed out as another factor that has hampered such efforts. In other words, the economic system, in which consumers with no means to grasp the environmental impact of production sites seek high-quality, inexpensive products, has facilitated the import, manufacture, and distribution of inexpensive agricultural, forestry, and fishery products without adding costs for reducing their environmental burden to the products (externalization of costs), which is one of the factors facilitating the loss of biodiversity at production sites of global agriculture, forestry, and fisheries.

Agriculture, forestry, and fisheries can only be managed by utilizing the blessings of nature, and biodiversity is an indispensable production base, which produces soil and water that nurture agricultural, forestry, and fishery products. In addition, because the ecosystem in rural areas and communities not only produces agricultural, forestry, and fishery products but also provides many ecosystem services to the entire nation, including water resource conservation function, food culture, and beautiful landscapes, it is important to make sustainable use of this ecosystem in the future. To achieve sustainable food production and agriculture, forestry, and fisheries, it is necessary for all people who are engaged in the supply chain to understand this and make choices that lead to biodiversity conservation in their respective jobs and lives. In addition, because the benefits of ecosystem services extend to the entire society, it is important that the costs of reducing environmental burden and conserving biodiversity be borne not only by producers but also by the entire supply chain, which is linked to distribution, processing, and consumption, and be supported continuously by agricultural, forestry, and fisheries policy measures.

To this end, agricultural, forestry, and fisheries policy measures will incorporate a perspective focusing more on biodiversity throughout the supply chain, promote sustainable food production and agriculture, forestry, and fisheries, and revitalize rural areas and communities, which are the production sites of agriculture, forestry, and fisheries and the living places of those who are engaged in such production activities.

(1) Mainstreaming biodiversity at production sites [Target 10]

1) Agriculture

In rural and Satochi-Satoyama areas, a diversified environment established through proper maintenance by humans, including wooded areas, groves of shrines, homestead woodlands, and hedges, in addition to paddy fields, channels, and irrigation ponds, forms a network, and makes up a space with enriched biodiversity, in which various species of wildlife inhabit and grow, through people's continuous efforts in agriculture and forestry. In rural and Satochi-Satoyama areas that are secondary nature, there is a concern that the excessive use of pesticides and fertilizers or the implementation of projects using construction methods that prioritize economic performance and efficiency will have a negative impact on biodiversity. In addition, with the recent decline in the use of Satoyama forests and the increase in abandoned cultivated land due to a shortage of those engaged in agriculture and forestry, it is found that the number of organism species that had been seen in the past is decreasing, and that damage to agriculture and forestry due to wildlife is becoming serious owing to the expansion of the habitat ranges of certain wild animals.

Therefore, in order to conserve biodiversity in rural and Satochi-Satoyama areas that are secondary nature, and to provide a stable food supply and a natural environment rich in biodiversity to citizens, the government will promote agricultural production and the development and conservation of rural and Satochi-Satoyama areas, with more emphasis on reducing the environmental impact and conserving biodiversity through greening agriculture, forestry, and fisheries.

(i) Promotion of agricultural production focusing more on biodiversity conservation [Target 7]

In the MIDORI Strategy, key performance indicators (KPIs) are set to aim at reducing the risk-weighted use of chemical pesticides, reducing the use of chemical fertilizers, and expanding the area of organic agriculture. In addition to applying the existing superior technologies to other fields, the Strategy is aiming to develop innovative technologies and production systems sequentially by 2040 and realize their social implementation by 2050.

(Risk reduction of chemical pesticides, etc.)

The government is aiming to reduce the risk-weighted use of chemical pesticides by 50% by 2050.

Therefore, in addition to gradually utilizing the smart pest management technology, shifting from high-risk pesticides to lower-risk ones, and establishing and disseminating an integrated pest management that does not rely solely on chemical pesticides, by 2040, the government will develop new pesticides and other pest control technologies that may replace the use of conventional insecticides, including neonicotinoids that are widely used.

Moreover, the government will promote efforts to reduce the use of chemical pesticides by inspecting and reviewing existing farming methods in each production area to shift to more sustainable farming methods without losing productivity, such as reviewing the cultivation calendar.

Furthermore, the government will promote integrated pest management, under the Plant Protection Act (Act No. 151 of 1950), which was amended in 2022, through the establishment of plans by prefectural governments for the implementation of integrated pest management in accordance with the National Basic Guidelines for Integrated Pest Management (Ministry of Agriculture, Forestry and Fisheries Notification No. 1862 of November 15, 2022).

In order to ensure the safety of agricultural chemicals for the environment, the government sets standards for the use of each agricultural chemical upon rigorous scientific review of toxicity, water pollution, and effects on flora and fauna in the human living environment at the time of registration, and efforts will continue to be made to promote proper use, including compliance with the standards of use. In addition, in accordance with the Agricultural Chemicals Regulation Act (Act No. 82 of 1948), which was revised in 2018, all agricultural chemicals will be reevaluated in a sequential manner based on the latest scientific knowledge in order to further enhance the safety of agricultural chemicals.

(Reduction of chemical fertilizers and recycling of organic materials)

The government aims to reduce the use of chemical fertilizers made from imported raw materials or fossil fuels by 30% by 2050.

To this end, the government will demonstrate the improvement of productivity through the input of compost and promote the use of compost by farmers while developing an environment in which compost and other materials that are easy for crop farmers to use can be obtained anywhere, including the quality improvement of compost and the promotion of wide-area distribution through pelleting, thereby promoting the recycling of organic materials, such as replacing chemical fertilizers with compost and other materials.

In addition, the government will promote the efficiency improvement and smartification of fertilizer application, such as the introduction of “smart fertilizer application” that enables optimal fertilizer application by accumulating and utilizing data, while eliminating wasteful fertilization and improving efficiency through fertilization in accordance with soil and crop growth as well as local fertilizer application to the rooting zone that facilitates absorption by crops.

Moreover, the government will promote efforts to reduce the use of chemical fertilizers by inspecting and reviewing the existing farming methods at each production site to shift to more sustainable farming methods without losing productivity, such as by reviewing the cultivation calendar.

(Promotion of agriculture focusing on reduction of environmental impact, such as organic agriculture)

Efforts are further required to promote environmentally friendly agriculture that places a focus on the reduction of the environmental burden on rural and Satochi-Satoyama areas. Therefore, the government will promote the introduction of highly sustainable agricultural production systems that use technologies highly effective in improving soil properties and reducing the use of chemical fertilizers and chemical pesticides, and provide support to organizations established by farmers engaging in farming activities that are highly effective in biodiversity conservation, such as organic farming and winter flooding management, in conjunction with farming practices that seek to reduce the use of chemical fertilizers and chemical pesticides to less than half of the local practice levels in principle.

In addition, the government will promote the systematization and diffusion of practical organic farming techniques, which are highly effective in biodiversity conservation while reducing the environmental burden derived from agricultural production activities. The government will also support municipalities that work on initiatives involving the entire community, consistently from production in organic farming to consumption such as use in school meals. Along with this, technology for the next generation of organic agriculture will be established by 2040 so that many farmers can work on principal items. Through this initiative, the government aims to increase the ratio of organic farming* to total cultivated land to 25% (1 million ha) by 2050 (*international organic agriculture).

Furthermore, in order to promote the proper use of pesticides and fertilizers, proper treatment and recycling of waste, and control of greenhouse gas emissions, the government will promote the dissemination of international-level GAP, covering the field of environmental conservation.

Biodiversity restored by utilizing idle, devastated lands as vineyards

At “Mariko Vineyard” in Ueda City, Nagano Prefecture, opened in 2003 by Mercian Corporation, a subsidiary of Kirin Holdings Company, 168 species of insects, including endangered species, and 288 species of plants have been confirmed.

The conversion of idle, devastated lands into vineyards for Japanese wine grown under hedge planting and grass cultivation, and the proper management of undergrowth have led to the creation of high-quality, vast pastures and grasslands, thereby improving biodiversity.

(ii) Development and dissemination of agricultural production technologies focusing more on biodiversity conservation [Target 7]

(Development and dissemination of technologies to reduce the environmental impact of chemical pesticides, fertilizers, etc.)

With the spread of pests being a concern due to climate change and other factors, in order to reduce the risk posed by the use of chemical pesticides, it is necessary to promote the initiative of “integrated pest management” that does not rely solely on chemical pesticides but instead focuses on developing cultivation conditions that are less likely to have pests and weeds (prevention) and forecasting the pests (prediction).

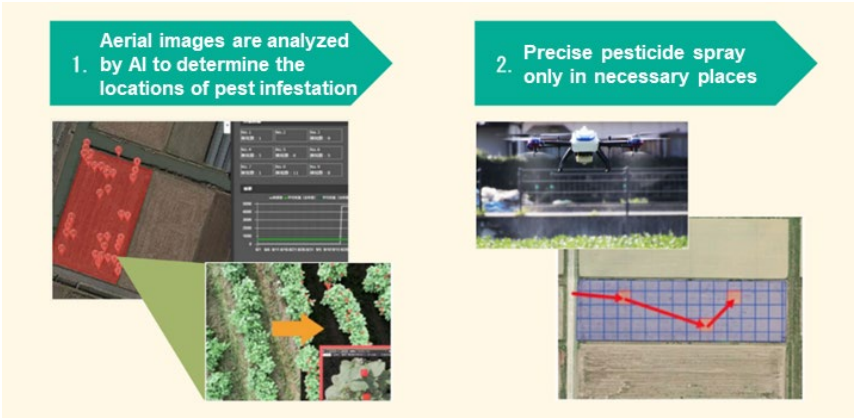
In particular, in order to reduce the risk caused by the use of chemical pesticides and to hold down the disturbance of ecosystems as much as possible, the government will promote the establishment of early detectable and highly accurate pest forecasting technologies using AI, etc., and the development of efficient spraying technology of chemical pesticides.

Moreover, the government will promote the development of smart agricultural technologies that focus on environmental conservation, such as the use of smart agricultural technologies to reduce pesticides and fertilizers, and the use of renewable energy for smart agricultural machinery, while supporting farmers in establishing and diffusing cultivation technologies from the perspective of biodiversity conservation, such as the demonstration of integrated pest management in accordance with the actual local situations and support for environmentally friendly agriculture.

Simultaneous reduction of costs and environmental burden through pinpoint pesticide spraying with drones

OPTiM Corporation, a system development company, and Michinoku Bank, Ltd. have established a smart agricultural regional trading company, OPTiM Agri Michinoku Corporation (Aomori City).

Utilizing the patented technology “Pinpoint Pesticide Spraying and Fertilization Technology” developed by OPTiM, the company uses drones to apply pesticides in a pinpoint manner only to areas where AI detects pests, thereby greatly reducing the environmental impacts.



(Promotion of technologies for soil productivity improvement and water management to achieve both productivity improvement and ecosystems conservation)

A decrease in the activities for soil productivity improvement and excessive use of chemical pesticides and fertilizers may lead to disturbance of the ecosystem of the region, including the degradation of soil and deterioration of soil fertility. There is also a danger of posing a problem to continuous agricultural production. Therefore, it is necessary to encourage activities for soil productivity improvement, effective and efficient fertilization, and pest control, and to implement agricultural production focusing more on biodiversity conservation.

For this reason, the government will facilitate the prevention of soil degradation and the maintenance and improvement of soil fertility through the introduction of no-till farming and crop rotation while promoting the use of organic matter in farmland soil through soil productivity improvement and proper fertilizer application based on soil assessment, diffusion and expansion of the use of pellet compost, and the introduction of green manure cultivation. In addition, the environmental impacts will be reduced by utilizing fertilizer components derived from organic materials such as compost and by improving fertilization efficiency through local fertilizer application to the root zone.

Furthermore, in addition to the previous assessment of the physical and chemical properties of soil, the government will promote the establishment of biological assessments for the advancement of soil productivity improvement.

Other than the above, the government strives to collect and provide information on water management technologies that take into account the living organisms, including winter flood control and postponing midseason drainage.

(iii) Promotion of conservation of ecosystem networks consisting of paddy fields, channels, irrigation ponds, etc. [Target 11]

The waterside environment in rural areas including paddy fields, channels, and irrigation ponds forms an organic network of the ecosystem. For instance, medaka and loach living in small rivers swim up to paddy fields and agricultural water channels during the spawning season and spawn in paddy fields and waterweeds in shallow waters. As such, various creatures use different environments for growth and inhabitation according to their life history. Such networks are conserved by the production and maintenance activities of farms and local residents, contributing greatly to biodiversity conservation. Moreover, because Japan is one of the most important landing zones for migrating birds in the world, it is important to improve the environment of agricultural villages such as paddy fields in order to maintain the habitat environment for these birds in the future as well. For this reason, it is important to form

networks of ecosystems that link forests with the ocean through rivers, in addition to seamlessly linking between rivers, paddy fields, channels, and irrigation ponds.

Moreover, maintenance and renewal are necessary for paddy fields and channels that form the waterside environment in rural districts in order to improve the efficiency of production activities or for disaster-prevention. Considering biodiversity conservation becomes necessary for the improvement and renewal of such agricultural lands and facilities.

Specifically, upon infrastructure improvement including farmland consolidation, the government will take into consideration the entire area and specify the species to be conserved in line with the local endemic ecosystems, in order to conserve the networks of ecosystems consisting of paddy fields, channels, and irrigation ponds. Through obtaining the understanding and participation of local residents, the government will systematically promote the development of fishways, biotopes, and other facilities that take into account ecosystems in a way that pays close attention to the life history and migration routes of respective specified species. And the government support measures to secure water for conserving ecosystems such as water for the winter flooding of paddy fields.

Lower Maruyama River and the Surrounding Rice Paddies," registered wetlands under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat: Toyooka Living together with Oriental storks"

Located in the northern part of Hyogo Prefecture, the "Lower Maruyama River and the Surrounding Rice Paddies" are formed by a variety of wetlands, centered on the Maruyama River with a very gentle flow where brackish water extends over 16 km upstream from the river mouth. Efforts have been made to create and regenerate a rich ecosystem involving various parties, with the keyword of "returning to the wild" Oriental storks that once went extinct.

In recognition of these initiatives, the site was registered as a wetland by the Convention on Wetlands of International Importance Especially as Waterfowl Habitat in 2012, and the expanded site was registered in 2018.

(iv) Promotion of livestock farming focusing more on biodiversity conservation [Target 7]

(Establishment of a system for the production increase and use of domestic feed)

With a feed self-sufficiency ratio of about 25%, Japan depends on foreign countries for most of its feed, and the structure is such that the consumption of feed in Japan affects the biodiversity in the production areas abroad. Therefore, it is important to increase the production of domestic feed, and the government will promote the establishment of a system to further increase the production of domestic feed and its use through the following initiatives: improving the operational efficiency and reinforcing the operation of feed production organizations, using good varieties of feed crops and stably producing them, using public ranches, promoting the production of domestic concentrated feed, and making new use of unused resources and improving their quality. At the same time, efforts will be promoted to reduce the environmental burden through the reduction of carbon dioxide emissions during feed distribution.

(Promotion of utilization of livestock excreta)

Livestock excreta is required to be properly managed under the "Act on the Appropriate Treatment and Promotion of Utilization of Livestock Manure" (Law No. 112 of 1999), and its utilization as manure and other materials has been promoted.

In order to further promote the use of manure, it is necessary to promote a variety of initiatives in response to the actual local situations, such as the production of high-quality manure to meet the needs of crop farmers and the promotion of wide-area distribution through pelleting, while at the same time making use of manure both within the management entity and within the region.

The government will also promote the use of energy by methane fermentation of livestock excreta and the recycling of resources by using liquid fertilizer from fermentation residues.

Furthermore, under the Japan Good Agricultural Practices (JGAP) in livestock farming, the government is implementing measures to reduce the environmental impact through appropriate storage and treatment of waste and other materials, as well as initiatives that take into account biodiversity, and will contribute to the reduction of the environmental impact at production sites by promoting the acquisition of GAP certification.

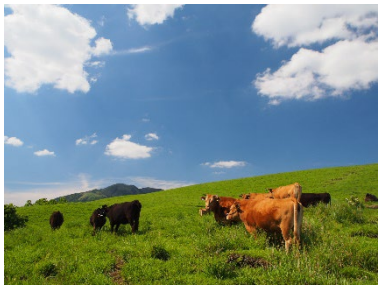
(Promotion of the improvement, conservation, and use of pastures and grasslands)

Pasture and grassland make up a precious ecosystem, providing a place to live for many species. Most pastures and grasslands are managed artificially with purposes such as grazing and mowing, and a peculiar natural environment is being formed and maintained by preventing the incursion of bushes. This contributes to the conservation of ecosystems and genetic resources, and the conservation of biodiversity of species favoring pastures and grasslands, such as wildlife protection. For example, pasture and grassland in Aso Kuju Highland are maintained as the habitat of plants like *Polemoniaceae* and *Echinops setifer*, or rare species of butterfly such as *Shijimiaeoides divina*, through human intervention such as agricultural production activities including grazing and mowing, or activities participated in by citizens.

On the other hand, in pastures and grasslands, the material cycle of soil, grass and pasture plants, and livestock is formed. Therefore, the government will promote the improvement of the capacity for food self-sufficiency/food self-sufficiency ratio through the improvement of the feed self-sufficiency ratio, effectively use national land, and establish cyclical livestock farming. At the same time, it also becomes possible to maintain sustainable production of livestock, and to maintain livestock farming. Therefore, it is important to continuously carry out adequate maintenance and management. In addition, the majority of pastures are alien species and may have an impact on the surrounding ecosystem, so appropriate measures will be necessary, such as prevention of the spread of alien species and conservation of indigenous species.

For this reason, support will be provided for activities undertaken on a community-wide basis, such as the promotion of grazing and improvement of grasslands to maintain the productivity and function of grasslands, and the development of grazing lands, including public ranches having valuable grassland resources.

Conservation of rare fauna and flora by maintaining pastures and grasslands and sustainable agriculture: Aso area, Kumamoto Prefecture



Pastures and grasslands naturally undergo transition to forests over time, but in the Aso region, one of the largest pastures and grasslands in Japan is maintained by continuous management by humans. Residents manage pastures and grasslands in all seasons mainly by “open burning” by which they burn grass, “grazing” by which they pasture cattle and horses, and “mowing” by which they cut grass. Because only the surface of the field is burned during the open burning in Aso, it does not affect plant seeds or insects in the soil, and the grassland is maintained while many rare plants and animals still remain.

In recognition of this, “Managing Aso Grasslands for Sustainable Agriculture” was designated a Globally Important Agricultural Heritage System (GIAHS) in May 2013.

(v) Promotion of urban agriculture [Target 12]

Agriculture in urban and peripheral areas not only supplies fresh agricultural products to urban residents, but also fulfills functions such as the following: maintaining the environment and scenery by providing water, greenery, and natural space to provide relaxation and enjoyment; providing space where anyone from children to adults can experience agriculture in the form of allotment gardens or have close contact

with creatures; securing open space in preparation for disasters; mitigating the heat island phenomenon as greenery in the city; retaining rainwater; recharging groundwater; and preserving biodiversity. The government will promote urban agriculture in which these diverse functions will be properly and fully realized in the future.

2) Forests and forestry

Japan is a forest-rich country, with forests accounting for two-thirds of its total land area. Such forests are a key element for the conservation of biodiversity as habitats of diverse wildlife. There are diverse types of forests, ranging from planted forests developed after the war for the greening of degraded national land to primeval natural forests that are registered as World Natural Heritage sites such as “Shiretoko,” “Shirakami-Sanchi,” “Yakushima,” “Ogasawara Islands,” and “Amami-Oshima Island, Tokunoshima Island, Northern part of Okinawa Island, and Iriomote Island.”

While the development of forests requires a long period, usually some decades, various environments are formed during their growth, consisting of grass plants, low- to medium-height trees, and high trees, and biodiversity in the forests changes accordingly, along with the habitats and growth environments for wildlife. Especially in the case of planted forests mainly consisting of coniferous trees, for example, proper forest management or maintenance such as thinning in accordance with the growth stage can improve the light environment and develop herbaceous species, and harvested or replanted forests can replace the grassland environment, which is being lost due to the drastic reduction in Japan, and function as hunting grounds for raptors. Biodiversity is conserved, together with the development of sound forests by creating forests with different forest ages in the aspects of space and time.

On the other hand, secondary forests mainly consisting of broad-leaf trees in Satoyama were once maintained in human interaction as a source of fuel and fertilizer and maintained their biodiversity, but it has become difficult to maintain them due to the decrease in their use as energy and materials since the 1950s to 1960s, as well as due to the decrease in the population living there and changes in the social structure. The increasing difficulty of maintaining Satoyama has resulted not only in the reduction of biodiversity but also in damage by birds and animals, and there is an urgent need to restore the ecosystem function of Satoyama through the use of it not only in forestry but also with the participation of various entities.

In addition, Japan imports about 60% of its domestic wood supply, while domestic forest resources are ready for harvest. When using resources from other countries, it is also necessary to keep in mind the biodiversity outside the country. In order to contribute to the creation of a sound material-cycle society, actions against global warming, and vitalization of mountainous villages in addition to the conservation of biodiversity within the country and abroad, it is necessary to further promote the effective use of forest resources within the country and abroad sustainably in multiple stages, while it is also necessary that wide public including city residents foster a greater understanding of forests, forestry, and wood use from the perspective of biodiversity conservation and the prevention of global warming, by being involved in fostering forests and sustainably using them according to their respective circumstances.

Furthermore, the Kunming-Montreal Global Biodiversity Framework sets forth the so-called “30 by 30” target of conserving and managing at least 30% of the world’s lands and oceans respectively through protected areas and “other effective area-based conservation measures” (OECM), and Japan also needs to appropriately conserve and manage these areas.

In light of these challenges, in order to promote the mainstreaming of biodiversity in the forest and forestry sector in Japan, the government strives to demonstrate the multiple functions of forests, including biodiversity conservation by comprehensively implementing measures for the management and conservation of forests, which are important building blocks, and for the sustainable use of forest resources.

In particular, based on the Basic Plan for Forest and Forestry formulated in June 2021, the government works to fulfill the publicly beneficial functions of forests, including the conservation of biodiversity, by continuously promoting the development of diverse forests consisting of various growth stages and tree species over a certain planar area, as well as by appropriately conserving and managing primeval natural forests. It also makes effective use of domestic forest resources by promoting the revitalization of domestic forestry centered on the promotion of the use of domestic woods, including new uses. The government will also promote measures against forest damage caused by wild birds and animals, promote public understanding of forests, forestry, and timber through forest environmental education, and promote the use of forest space through the forest-related service industry. At the same time, through

support for the conservation of forests and sustainable forest management abroad, the government contributes to biodiversity conservation in forests on a global scale.

(i) Conservation of biodiversity through management and conservation of forests [Targets 2 and 3]

(Management of diverse and sound forests)

Forest ecosystems are constantly changing over time due to natural regeneration, natural disasters, and human-induced logging and planting, and there are various vegetation types that are suitable for unique natural conditions and site conditions over a certain planar area.

It is important that forests of various growth stages and tree species are arranged in a balanced mosaic pattern in order to sustainably fulfill the multifunctional roles of forests, including the conservation of biodiversity, into the future, and it is necessary to promote the management and conservation of forests in a way to aim for achieving such conditions.

In view that all forests contribute to the conservation of biodiversity as habitats and growth environments for a wide variety of living organisms, the government will promote the development of ecologically diversified forests through the transition to broad-leaved forests, the promotion of long-term management, and the transition to mixed forests of conifers and broadleaf trees, as well as the implementation of thinning according to their current conditions and natural conditions. It will also promote appropriate forest development such as the steady implementation of reforestation after harvesting. In addition, in order to preserve the forest ecosystem, the government will promote measures to control forest pests, such as measures to control the damage caused by pine weevils and oak wilt, in collaboration with prefectural and other local governments, and will work to prevent wildfires. Moreover, technologies to reduce forest damage due to organisms and to coexist with them will be developed, such as developing varieties resistant to pests.

National forests account for about 20% of the entire national land area and about 30% of the total forest area, many of which are located in remote backbone mountain ranges and water source areas, and have diverse ecosystems including planted forests and primeval natural forests. Based on the location and the status of forest resources, the government is working on forest management with the aim of conserving biodiversity, maintaining and enhancing publicly beneficial functions such as the conservation of national land, sustainably and systematically supplying forest products, promoting local industries by utilizing national forests, and improving the welfare of residents. In managing the forests, the government will classify them into functional types such as nature management conservation type and water resource conservation type, promote the management of forests suitable for the breeding and growing rare species, and promote the thinning and the development of multi-layered forests. In addition, the government will promote the operation appropriate as public welfare forests in line with the concept of managing the forests that correspond to each functional type category, such as by taking into consideration the effective use of forest resources.

An image of developing ecologically diversified forests for the conservation of biodiversity

Biodiversity in forests is maintained by temporal and spatial variation in forests.

A wide variety of biota can be protected as a whole if different species can grow and live in each forest by considering the layout of forests in a wide area and arranging forests of various tree species, structures, and by forest ages in a mosaic pattern in regional forest management.

It is also important for organisms to grow and inhabit in a habitable environment that exists with a certain extent and continuity.

Therefore, in order to conserve biodiversity in forests, it is important to balance the mosaic of diverse forests with the planar expansion of the individual forests that constitute it.

A landscape in which various forest types are arranged in a mosaic pattern (Hokkaido University Graduate School of Agriculture, 2016)

Source: Excerpts from “Forest Management Textbook Taking Biodiversity into Consideration (Kanto and Chubu editions),” Forest Research and Management Organization, Forestry and Forest Products Research Institute

(Response to natural forests and rare wildlife species)

In natural forests, where primeval forest ecosystems are maintained, and in forests where rare wildlife inhabit and grow, the basic policy is to leave them to the transition of nature, and those who are related to national and private and public forests will work together to preserve and restore forest ecosystems, protect and manage scattered rare forest ecosystems, and ensure the continuity of these forests. At the same time, adaptive conservation and management will be promoted for Satoyama secondary forests, which constitute a complex ecosystem with farmland, grassland, etc. whose use is decreasing and is causing changes in species composition and species diversity.

In addition, national forests, which play an important role in conserving the natural environment, protecting wildlife, and reserving genetic resources, will be managed by focusing on the maintenance and enhancement of publicly beneficial functions including the function to conserve the natural environment. Moreover, rare wildlife species in national forests will be protected by taking into account the perspective of biodiversity conservation as well, in cooperation with local residents, volunteers, NPOs, etc.

(Extensive and elaborate protection and management of forest ecological networks in national forests)

Regarding national forests existing widely in remote mountain areas, there are many forests having beautiful landscapes including World Natural Heritage sites such as “Shiretoko,” “Shirakami-Sanchi,” “Yakushima,” “Ogasawara Islands,” and “Amami Oshima Island, Tokunoshima Island, Northern part of Okinawa Island, and Iriomote Island,” and World Cultural Heritage sites, forests maintaining rich ecosystems inhabited by rare wildlife, and forests forming favorable environments together with waterfronts such as mountain streams or other landscapes. They are also connected with various ecosystems other than forests, including agricultural land, rivers, and seas. In addition, from the perspective of biodiversity conservation, it is necessary to promote the conservation and management of these forests.

For this reason, the government has designated primeval natural forests and the forests necessary for the habitat and growth of rare wildlife as “Protected Forests” to promote adaptive protection and management through monitoring surveys, etc. The “Forest Ecosystem Reserve,” one type of protected forests, is positioned as a protection measure to maintain the value of the World Natural Heritage into the future. In addition, in order to promote interactions between populations and conserve species and genetic diversity by securing the migratory path connecting the habitats and growth environments of wildlife, the government will designate “Green Corridors” forming an ecological network that mutually connects the protected forests by also collaborating with those who are related to private and public forests. Furthermore, for forests along mountain streams and other water bodies that are not designated as protected forests or green corridors, natural forests are maintained as the migratory path of wildlife species and the supply source of seeds, and planted forests are developed into broad- leafed forests with the active introduction of broadleaf trees. By securing the continuity of forests from primeval natural forests centered on protected forests located in the upper river basins to downstream basins through these measures, efforts are made to protect and manage forest ecological networks more extensively and elaborately.

(Fulfillment of publicly beneficial functions of forests by protection forests)

Forests have functions to conserve national land, including water resource conservation and disaster prevention, and a function to conserve the environment, as well as publicly beneficial functions including the conservation of biodiversity. In order to ensure the fulfillment of these publicly beneficial functions, it is necessary to implement appropriate forest conservation and management. Therefore, forests that are especially expected to fulfill their publicly beneficial functions are designated as protection forests to control harvesting and conversion to other land use. At the same time, the installation of forest conservation facilities in devastated lands and the improvement of forests where their conservation functions have deteriorated are being promoted.

(Promotion of forest management by forest owners)

While the Government supports the management of forests by forest owners and private forestry operators entrusted with the management of forests by forest owners, local municipalities promote the management of forests whose owners are unable to manage appropriately with the use of the Private Forest Management Entrustment System. Along with this, the government will promote conservation and management efforts in areas where biodiversity is conserved by the private sector.

(ii) Contribution through forestry and utilization of domestic forest resources taking biodiversity into consideration [Target 1]

(Consideration for biodiversity in forestry practices)

In forests that require active human intervention for the cultivation of forest resources, the restoration of forests of diverse forest ages will contribute to increasing biodiversity through the harvesting of trees in an appropriate manner within the limitation of the productivity of forest ecosystems and by reliably updating the sites. In addition, forestry, which provides a bases for the productive capacity of the forest ecosystem, forms an environment consisting of a diverse hierarchical structure including grass plants, low- to medium-height trees, and high trees in the process of their respective growth process through nursery work, such as cutting, afforestation (planting, natural regeneration), weeding, bud picking, and thinning, for the purpose of using wood during forest growth which takes a long time, and provides a suitable habitat, growth environment, and biodiversity for wildlife in the forest in tune with this. From the perspective of sustainable use, preservation, and cultivation of forest resources, the government will also contribute to the conservation of biodiversity by establishing a labor-saving and low-cost afforestation system that incorporates an integrated operation and new technologies such as elite trees, and by properly implementing forestry practices such as reforestation and nursery.

In addition, in ensuring biodiversity conservation in forests, it is an important factor that forestry contractors who are actually engaged in the management and conservation of forests take actions not only from the perspective of wood production but also from the perspective of biodiversity conservation on the grounds of such recognition as above. In order to achieve this, under the forest planning system, Regional Forest Plans show guidelines on practices taking into consideration the protection of rare wildlife species.

As for forest certification, where private third-party organizations evaluate and certify sustainable forest management, biodiversity conservation is one of the important requirements for obtaining certification. As such, various efforts for the conservation of wildlife species are being initiated also at the actual working sites, including the establishment of protection forests along mountain streams and ridges and the conservation of hollow trees that are important for nesting.

The government continuously strives to adequately operate forest planning systems while further promoting the consideration of biodiversity conservation at the actual working sites of forestry operations by introducing specific case examples of efforts made.

In addition, adequate forestry practices will be promoted by training Forest General Managers (Foresters) who support the establishment of the Municipality's Forest Improvement Plan, Forest Practice Planners who play the central role in the formulation of Forest Management Plans in line with such Municipality's Forest Improvement Plans, and Forest Management Planners who practice sustainable forest management.

(Sustainable and effective use of domestic forest resources)

In order to fulfill the multifunctional roles of forests including biodiversity conservation and carbon fixation and to contribute to carbon neutrality, it is necessary to conduct proper development or management of forests, and to this end, it is important that wood supplied through adequate production activities is used by end consumers and that forest owners can collect from the profits the expenses they incurred.

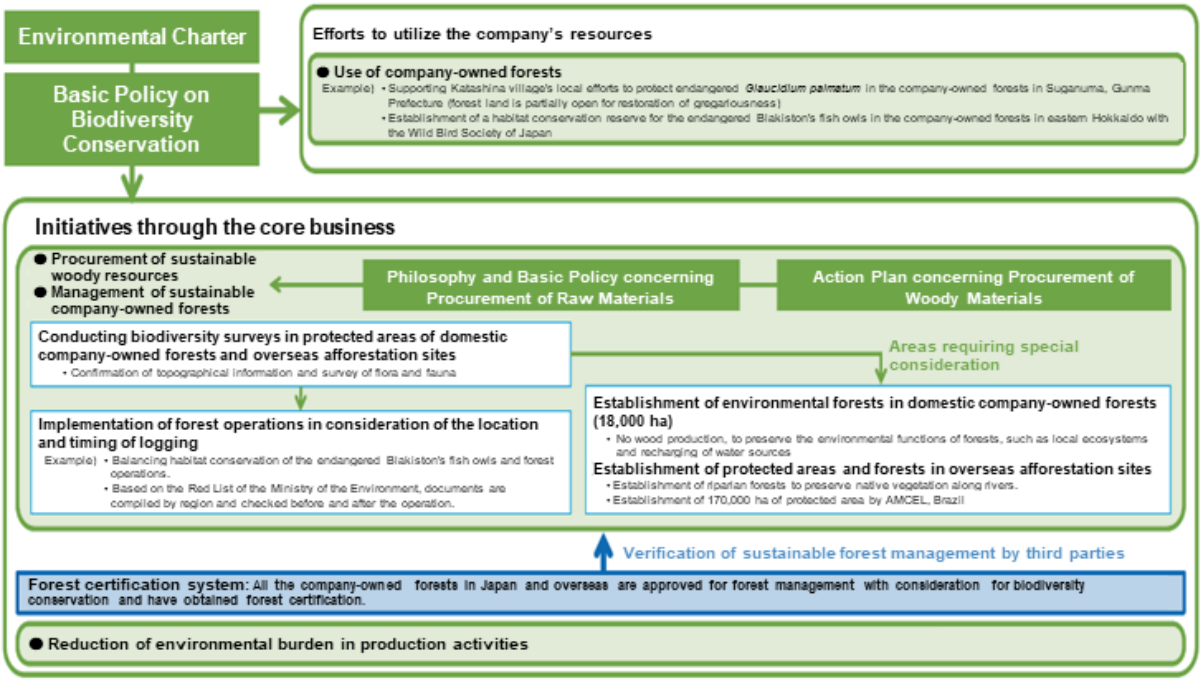
For this reason, the government will promote structural reforms, centered on the reduction of the costs of material production, distribution, and processing as well as the establishment of a stable supply system for products with reliable quality and performance, while developing and disseminating cross-laminated timber (CLT) and wood-based fire-resistant materials, and promoting the use of domestic timber in public buildings and private non-residential buildings, and the use of wood-based building materials, including hardwood, in furniture and interiors. In addition, in order to promote the use of woody biomass energy in

a form that ensures the sustainability of forests, the government will promote the use of heat and cogeneration with high energy conversion efficiency within the region, based on the utilization of unused materials and cascading.
Moreover, the government will promote research, technological development, application development, and diffusion of new materials that can substitute for plastics, such as cellulose nanofibers and glycol lignin derived from woody biomass, since these new wood-based materials have a high potential as a measure for plastic reduction.

"Basic Policy on Biodiversity Conservation" originating from the "Environmental Charter" and its implementation

With the "Environmental Charter" as its starting point, business activities of the Nippon Paper Group are being promoted under the "Basic Policy on Biodiversity Conservation," which stipulates its efforts to promote the development of technologies, products, and services that contribute to the conservation of forest biodiversity and the sustainable use of ecosystem services as the foundation of its business, as well as to reduce the environmental burden on biodiversity by actively engaging in recycling and resource conservation.

In the course of sustainable forest management, the company conducts biodiversity surveys of its own forests and takes initiatives to conserve them while striving to reduce the impact on biodiversity also in the manufacturing process of paper and other products, including wastewater treatment and the control of greenhouse gas emissions.



3) Fisheries industry

Japan is surrounded by the ocean and has extensive territorial water and exclusive economic zone, with many warm and cold currents running along the long coasts that stretch from north to south, and the coastlines are also diverse. As a result, the surrounding waters are home to 50 of the world's 127 marine mammal species and about 3,700 of the world's 15,000 marine fish species (including about 1,900 endemic to Japan), making it one of the most biodiverse waters in the world.

Since the fisheries industry uses natural resources, it is an environment-dependent industry relying on the bounties of the sea. Therefore, it is especially important to keep the soundness of the entire ecosystem that supports productivity, including not only conserving the fishery target species but also non-target ones, such as their feed species.

In particular, the coastal area of Japan has been closely involved with human activities from ancient days. People have been continuously conducting artisanal fisheries, including shellfish and seaweed gathering, while managing their resources. Such a sea area, where high productivity and biodiversity conservation are ensured with human intervention harmonized with the natural ecosystem, is now recognized as

“Satoumi,” and should continue to be conserved appropriately. For further offshore areas, it is important to ensure appropriate management and sustainable use of marine resources based on scientific evidence.

As shown above, it is necessary to secure a stable supply of fishery products that support the healthy dietary pattern of people into the future, as well as to promote the establishment of a strong fisheries industry and affluent and vigorous fishing villages through conserving Satoumi and the oceans.

In addition, the “Basic Act on Ocean Policy” (Act No. 33 of 2007) promulgated in April 2007 sets as its basic principle the harmonization between marine development and its use, and conservation of the marine environment. The Act sets forth the securing of marine biodiversity and conservation of other favorable marine environments as the basis for the existence of humankind. Furthermore, the “Marine Biodiversity Conservation Strategy” formulated by the Ministry of the Environment in March 2011, aims to conserve biodiversity that ensures a sound structure and functions of the marine ecosystem, and to use marine ecosystem services (bounties of the sea) in a sustainable manner. Conservation of Satoumi and the ocean conforms with such a concept.

In addition, the MIDORI Strategy strives to promote a new resource management system, develop and disseminate artificial juvenile production technology for cultured fish, and develop and disseminate alternative raw materials for fish meal, with the aim of recovering fish catches through appropriate management of fishery resources and establishing a sustainable aquaculture system that does not place a burden on natural resources. Through these initiatives, the government will contribute to the conservation of marine biodiversity.

(i) Promotion of the conservation and restoration of the marine environment [Targets 2, 3, 7, and 8]

(Conservation and restoration of the environment of fishing grounds including seaweed beds and tidal flats)

Seaweed beds play a major role in the growth of fishery resources, as seaweed and seagrass that are growing abundantly absorb carbon dioxide in the water and supply oxygen, providing marine species with spawning grounds, habitats for larvae and juveniles, and feeding grounds. In addition, tidal flats, which are often found in estuaries, are highly bioproductive, because nutrient salts and organic matter from the land area and various types of plankton from the sea are supplied by tidal action. Seaweed beds and tidal flats not only provide habitat for benthic species such as bivalves as well as larvae and juveniles, but also provide a purification function of water quality by these species and a buffer zone function to control rapid fluctuations in concentrations of nutrient salts flowing in from the land area.

However, the areas of these seaweed beds and tidal flats are decreasing, due to the development of coastal areas. Even in the existing seaweed beds and tidal flats, it has been pointed out that productivity in seaweed beds and tidal flats has declined due to the following: the dieback of seaweed and the change in species composition due to the rise in seawater temperature; the effect on seaweed beds due to the increase in activity of phytophagous fish such as rabbitfish that eat up seaweed, and the expansion of the distribution; the occurrence of dysoxic water masses; and the decrease in the supply of sediment from the land area.

In this context, it is important to raise the productivity of the entire ecosystem by conserving seaweed beds and tidal flats and recovering their functions. Based on the “Seaweed Bed and Tidal Flat Vision,” the government promotes maintenance and management activities by fishery workers and various other parties using methods appropriate to the environment of the water, such as the removal of species causing feeding damage in seaweed beds and tidal flats, transporting of seagrass, seaweed, and bivalves that secures genetic diversity and local endemism, and tilling of fishing grounds. Along with this, it will also promote the regeneration, restoration, and creation of seaweed beds and tidal flats in collaboration with the activities above.

Although coral reefs cover only 0.1% of the Earth’s surface, they form an important ecosystem for the conservation of biodiversity, with more than 90,000 species identified. In addition to being a place where diverse species coexist, they offer a variety of benefits, including rich fishing grounds, disaster prevention functions as a natural breakwater, and tourism resources. Coral reefs, on the other hand, form a highly fragile ecosystem. In Japan, massive bleaching occurred over a wide area in 2016 due to rising seawater temperatures, etc., and as much as 90% of reef-building corals bleached in the shallow area of Sekisei Lagoon, the largest reef area in Japan, which extends between Ishigaki Island and Iriomote Island. In addition to rising seawater temperatures, the degradation of coral reefs is becoming increasingly serious

in various locations due to various factors such as feeding damage by crown-of-thorns starfish, destruction of corals by typhoons, sediment such as red soil flowing in from the land area, nutrient salts, and chemical substances. Therefore, the government will work to develop technologies for the area-wide conservation and restoration of coral reefs, and support local activities such as coral transplanting, removal of species causing feeding damage, and removal of floating matter and sediment.

In addition, as for the deterioration of the growing environment for aquatic flora and fauna due to domestic effluent, etc., measures to reduce the negative impact on water quality from the land area will be continuously promoted, through measures such as the development of septic tanks and community sewerage systems (rural community sewerage facilities), the promotion of environmentally friendly agriculture, and measures to prevent soil runoff from agricultural land and its surroundings.

Since red tide and dysoxic water masses are still occurring in closed sea areas such as the Ariake Sea, Yatsushiro Sea, and Seto Inland Sea, efforts will be made to monitor the occurrence of these phenomena, clarify the mechanism, develop technologies to reduce the damage in fisheries caused by red tide and dysoxic water masses ,etc. In addition, in recent years, there are some sea areas where the impact of a change such as decrease in nutrients such as nitrogen and phosphorus on fishery resources has been pointed out. Therefore, the “Law Partially Amending the Law concerning Special Measures for Conservation of the Environment of the Seto Inland Sea” (Law No. 59 of 2021), which came into effect in April 2022, stipulates a nutrient salt management system that enables supply and management of nutrient salts as needed. And the government will work to facilitate harmony and balance between improving water pollution and ensuring the sustainable use of fishery resources. Based on such a situation, efforts will be made to clarify the effects of nutrient salts on fishery resources and to examine nutrient salt management according to the characteristics of each sea area.

(Promotion of measures against marine plastic waste)

Marine plastic waste has a negative impact on marine ecosystems due to accidental ingestion by marine species and entanglement with marine species, and has also caused damage to fisheries due to contamination of fish catches and entanglement with fishing boat screws, thereby affecting navigation. In addition, it has been pointed out that microplastics, which are gradually degraded by ultraviolet rays, etc. and get crushed and fragmented, have the property of adsorbing various chemical substances on their surfaces, raising concerns that they may affect marine species through the food chain.

For this reason, the government will promote the development and diffusion of fishing gear recycling technology, the development of fishing gear made from environmentally friendly materials such as marine biodegradable plastics, and, in cooperation with the Ministry of the Environment, the establishment of a system in which marine debris collected by fishery workers during their operations is brought back and then disposed of by local governments.

(ii) Promotion of development or maintenance of coastal environment/fishing ports and fishing grounds taking biodiversity into consideration

Fishing ports and fishing grounds not only serve as the production base for fisheries but also contribute greatly to the formulation of an environment that serves as the spawning grounds for marine species including species other than those targeted for fishing and as the nurturing grounds for larvae and juveniles by creating calm waters and highly productive environments. It is necessary to develop or maintain fishing ports and fishing grounds by giving due consideration to biodiversity.

Therefore, upon the development or maintenance of fishing ports and fishing grounds, utilization of various natural materials should be considered by giving full consideration to the impact on the natural environment of the site at each stage of planning, design, and construction. It is also necessary to understand the impact as far as possible through monitoring, and to promote the development or maintenance of fishing ports and fishing grounds by taking into consideration the natural environment, including biodiversity.

Particularly when developing or maintaining fishing ports or seacoasts, effort should be made to minimize changes in the surrounding natural environment. When implementing the project, the government will actively promote the creation of fishing ports and coastal environments harmonized with the surrounding natural environment. Examples include fishing port facilities that adopt construction methods and structures which offer habitats for fish and shellfish, including dikes wherein seaweed beds are formed for aquatic animals and plants to inhabit and propagate, and the development or maintenance of coastal

areas and implementation of coastal erosion control to mitigate the impact on the natural environment. The government also promotes development of fisheries community sewerage systems in fishing villages to alleviate the loads of foul water inflow to the nearby waters of fishing ports, and measures to conserve the quality of waters near fishing ports such as removing sludge within the fishing ports.

Regarding the improvement of fishing grounds, the increase of productivity of the entire ecosystem is pursued to in a way that facilitates the recovery and increase of living aquatic resources as well as the maintenance and recovery of a rich ecosystem. For those purposes, the creation of a favorable growing environment in accordance with the dynamics and life history of aquatic resources (growing environment including the material cycle mainly focusing on aquatic resources) will be promoted.

(iii) Further promotion of fishery resource management [Targets 4, 5, and 9]

(Promotion of a new resource management system)

The fisheries industry in Japan has a vitally important role to play in providing the citizens with a stable supply of fishery products, as well as in contributing to the development of fisheries and the promotion of fishing villages. However, since the volume of fishery production in Japan has been on a long-term downward trend, it is necessary to halt this downward trend in order to ensure a stable supply of fishery products to citizens.

In addition, the SDGs set Goal 14 “conserve and sustainably use the oceans, seas, and marine resources for sustainable development” to be achieved by 2030, and a goal to “by 2020, effectively regulate harvesting and end overfishing, illegal, unreported, and unregulated (IUU) fishing, and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics” was set in Target 14.4.

In response to such a situation, the Fisheries Act (Act No. 267 of 1949) was amended (hereinafter referred to as the “New Fisheries Act”) for the first time in approximately 70 years with the aim of developing fishery productivity by ensuring the sustainable use of fishery resources, and with the goal of achieving the maximum sustainable catch (MSY: maximum sustainable yield), it was stipulated that a new resource management system based on quantity control be implemented.

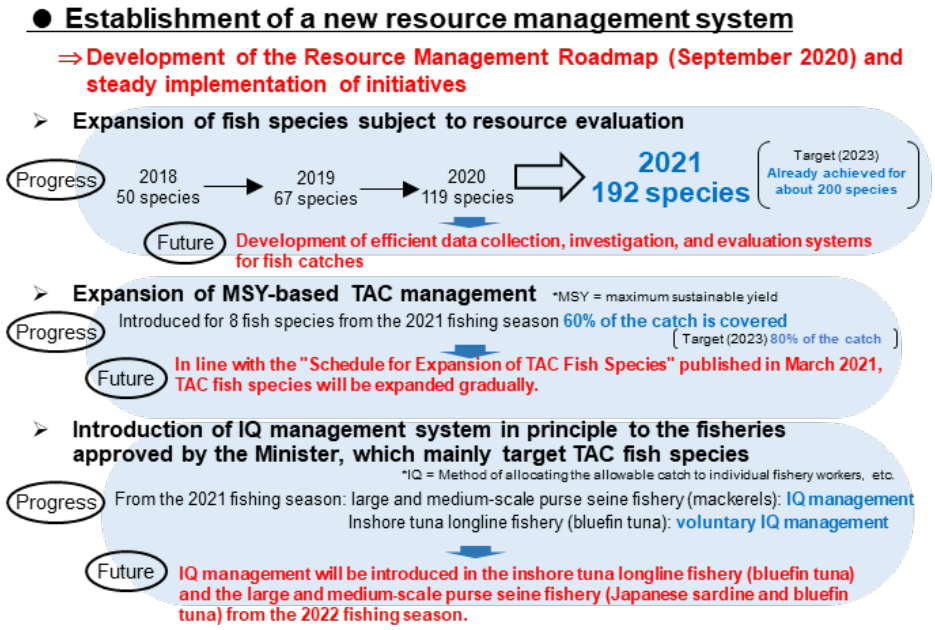
With the aim of establishing this new resource management system, in September 2020, prior to the enforcement of the New Fisheries Act (December 2020), the government has set the “Roadmap for the Promotion of New Resource Management (hereinafter referred to as the “Roadmap”), which laid out the immediate goals and specific paths for promoting resource management. The Roadmap aims to restore the catch to 4.44 million tons by FY2030 through the promotion of a new resource management system, and stipulates that the following specific measures be taken by FY2023: (i) expanding the number of fish species subject to resource assessment to about 200 and developing a system to electronically collect landing information for the collection of catch and other information, (ii) setting 80% of the total catch to be managed by the total allowable catch (TAC), (iii) introducing in principle the management by individual quota (IQ) for fisheries licensed by the Minister, which mainly target TAC fish species, and (iv) transferring the voluntary resource management (resource management plan) currently carried out by fishery workers to a resource management agreement based on the New Fisheries Act. The MIDORI Strategy also positions “appropriate management of fishery resources in line with the road map,” and the government will steadily implement the steps outlined in the road map to achieve both productivity improvement and sustainability.

Promotion of a new resource management system: Introduction of quantitative management of TAC, IQ, etc.

Conventionally, official regulations on resource management have focused on controlling fishing capacity by limiting the number and tonnage of fishing vessels and limiting fishing gear, fishing methods, fishing seasons, etc. However, due to technological innovations in fishing in recent years, the fishing capacity per ship and tonnage, etc. have increased, and the methods of management based on restrictions on the number and tonnage of fishing vessels, etc. are reaching their limits, which has rather made it impossible to ensure the sustainable use of fishery resources without converting to restrictions on the catch itself.

For this reason, the new Fisheries Act made it the responsibility of the national and prefectural governments to properly conserve and manage fishery resources, and also stipulated that the resources should be managed with the aim of achieving the MSY for fish catches and that management methods should be based on TAC.

In addition, the new Fisheries Act stipulates that the management of TAC should be based on the IQ by which the quantity is allocated to each fishing vessel, and that the management by the IQ system will be introduced in principle by FY2023 for fisheries licensed by the Minister, which mainly target TAC fish species.



(International resource management)

Regarding the sustainable use and management of highly migratory fish including tuna, the government will strive to set forth conservation and management measures based on scientific grounds and to eliminate IUU fishing through Regional Fisheries Management Organizations (RFMOs).

As for whales, in accordance with the “Basic Policy for Ensuring Sustainable Use of Whales” formulated in October 2020, they shall be used sustainably based on scientific evidence, as with other marine resources. In addition, the government will continue to promote the collection of scientific information necessary for the resource management of whales, including the collection of scientific data during non-lethal surveys and whaling operations, and contribute to the resource management of whales based on scientific knowledge in collaboration with international organizations such as the International Whaling Commission (IWC).

(Efforts for effective resource management)

To make resource management more effective, it is necessary to ensure compliance with resource management rules. In accordance with the New Fisheries Act, penalties have been strengthened for poaching and transporting abalone, sea cucumber, and other species that are maliciously poached, and enforcement will continue to be strengthened in accordance with the Act. Moreover, from the perspective

of ensuring an order of stable operations in the waters around Japan, the government will further strengthen the measures against illegal operations by foreign fishing vessels, etc.

In addition, the “Act on Ensuring the Proper Domestic Distribution and Importation of Specified Aquatic Animals and Plants” (Act No. 79 of 2020), came into force in December 2022, which aims to prevent the mixing of illegally caught or gathered aquatic animals and plants in the distribution process and the inflow of aquatic animals and plants derived from IUU fishing. This Act requires fishery workers who deal with specific aquatic animals and plants to report to governmental agencies, to communicate the catch number and other information, and to prepare and keep transaction records. With respect to specific animals and plants, the “class I specified aquatic animals and plants” are defined as aquatic animals and plants that are under a significant risk of illegal and excessive catching in Japan and thus particularly need resource management, and “class II specified aquatic animals and plants” are defined as aquatic animals and plants that require import controls under this Act from the perspective of preventing international IUU fishing. Abalone, sea cucumber, and glass eel (to be applicable from December 2025) are designated as class I specified aquatic animals and plants, while mackerel, skipper, sardine, and squid are designated as class II aquatic animals and plants, and the government strives to ensure proper distribution of aquatic animals and plants in Japan in accordance with this Act.

(iv) Promotion of biodiversity-friendly fisheries [Targets 5 and 9]

Maintaining an ecosystem in which aquatic species exist is important for sustainable fisheries.

Therefore, the government will work to reduce bycatch through the steady implementation of measures adopted by RFMOs) to mitigate the bycatch of sharks, seabirds, and sea turtles, the development and improvement of bycatch mitigation measures that are easy to implement and effective for fishery workers, and the educational and outreach activities. In order to avoid the extinction of Steller sea lions and reduce damage to fisheries at the same time, it will also promote measures such as appropriate management of the number of migrating Steller sea lions based on scientific knowledge. In addition, it will promote the conservation of endangered wildlife aquatic species by introducing strict measures, such as a ban on catching, based on scientific knowledge, as well as assessing the endangerment of marine species and producing a red list (list of endangered wildlife species) of them.

Furthermore, in order to protect the vulnerable ecosystems existing in seamounts and other areas and to coexist with sustainable fisheries, appropriate conservation measures will be implemented, based on an assessment of the impact of demersal fisheries on the vulnerable ecosystems, through RFMOs.

(v) Establishment and operation of marine protected areas [Targets 2 and 3]

Marine protected areas are defined as “Marine areas designated and managed by law or other effective means, in consideration of use modalities, aimed at the conservation of marine biodiversity supporting the sound structure and function of marine ecosystems and ensuring the sustainable use of marine ecosystem services. ” in the eighth meeting of the Headquarters for Ocean Policy held in May 2011 (Director-General: the Prime Minister). Areas that fall under this definition include Protected Water Surface that is suitable for spawning by aquatic animals and nursing juvenile fish, where development is regulated and catch is closed.

Oceans are included in the “30 by 30” target, which is set out in the Kunming-Montreal Global Biodiversity Framework in 2022. As of January 2021, Japan had designated approximately 13.3% of its marine areas as marine protected areas, but in order to achieve the target, it is necessary to designate marine areas that can be counted as OECM and to ensure conservation in these areas. In light of this, the designation of marine protected areas and OECMs will be promoted appropriately, including the improvement of their management by effectively utilizing existing legislation, in order to ensure the conservation of biodiversity and the sustainable use of ecosystem services in marine areas. Marine protected areas are not necessarily areas prohibiting human activities as is clear in the definition above. Japanese-style marine protected areas will be promoted with the common understanding that effective marine protected areas could include sustainable use as well as the conservation of biodiversity through voluntary co-management by fishermen.

With regard to the high seas, intergovernmental conferences have taken place in light of the United Nations General Assembly resolution in June 2015 to elaborate the text of an international legally binding instrument under the United Nations Convention on the Law of Sea (UNCLOS) on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ). At the plenary meeting, measures such as area-based management tools including marine protected areas have been

identified as one of the major topics of negotiation, and the process of designating area-based management tools including marine protected areas and regulatory measures have been discussed. The government will actively participate in the meeting to commit to the conservation and sustainable use of BBNJ.

(vi) Promotion of the release of juvenile fishes, sustainable aquaculture production, and conservation of inland water fisheries taking biodiversity into consideration

(Promotion of the release of juvenile fishes that takes biodiversity into consideration)

Since the recent stock statuses of many fisheries resources in the surrounding waters of Japan are at low levels, it is necessary to maintain and enhance the resources by carrying out improvements, including the release of fish seeds in an effective manner as part of resource management, and improvement of the growth environment for small larvae and juveniles, while also taking into consideration biodiversity.

For this reason, as for the release of juvenile fishes, in accordance with the “Technical Guidelines for Reducing the Risk of Impacts on Genetic Diversity Related to the Release of Artificial Seedlings,” efforts are made in a form that secures the genetic diversity of species in the marine area, such as obtaining, to the extent possible, the parent fish from the stock in the marine area where juvenile fishes will be released. The government will continuously promote efforts while giving due consideration to biodiversity.

(Promotion of sustainable aquaculture production that does not degrade the environment of fishing grounds)

Since aquaculture is an important sector that accounts for half of the world’s supply of fishery products, it is important to promote efforts that take environmental burdens into account by managing fisheries and reducing the burden on natural resources.

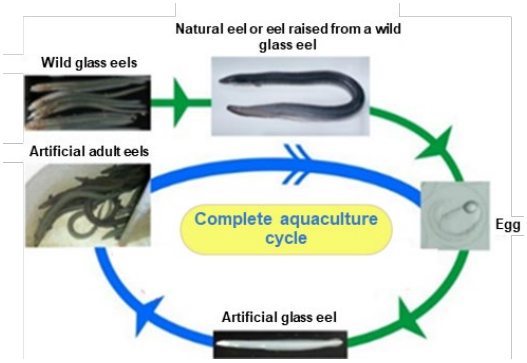
Therefore, sustainable aquaculture production that does not degrade the environment of fishing grounds will be realized by converting from fresh feed, which has a high environmental burden, to formula feed, which has a low environmental burden and high feeding efficiency, and by reducing the proportion of fish meal in the formula feed through the development of protein substitutes for fish meal such as plant materials such as soybeans as well as animal materials including insects. In addition, the government will promote the development and dissemination of artificial juvenile production technologies in the aquaculture of Japanese eels, bluefin tuna, etc. In the MIDORI Strategy, the government is also making efforts for the development and dissemination of artificial juvenile production technologies and alternative raw materials for fish meal to realize the social implementation of innovation. Furthermore, the introduction of closed recirculating aquaculture system isolated from the marine environment will enable the development of aquaculture that can reduce the burden on the marine environment, and operators will implement necessary measures to avoid adverse effects caused by the emergence of drug-resistant bacteria in aquaculture farms while promoting a sustainable aquaculture production system that does not rely on antimicrobial agents.

The government will implement salmon and trout propagation projects while ensuring harmony with ecosystems in the North Pacific and by taking into consideration the maintenance of the species characteristics and diversity between and within the species, envisaging the maintenance and sustainable use of salmon and trout resources. It will also strive to develop advanced techniques for releasing artificially developed fish seeds in a way that enables coexistence with wild fish. Thus, the government will promote a project for developing a technique of producing artificially developed seeds of salmon and trout while taking into consideration ecosystems in rivers and their surroundings.

Toward sustainable use of eels: Development and diffusion of artificial seedling production technology in aquaculture

Aquaculture accounts for most of the supply of eels in Japan, and about 70% of the eels distributed in the country are imported from China and Taiwan.

Recently, the stock status of Japanese eels has deteriorated, and it has been pointed out that changes in the marine environment, excessive fishing of parent eels and young eels (glass eels), and deterioration of habitats are the main factors. Therefore, it is necessary to ensure the sustainable use of eels by taking appropriate measures against these individual factors.



In eel farming, wild glass eels that come over to the estuary in the winter and spring are caught and raised as seedlings in aquaculture ponds. In 2010, complete aquaculture was successful, in which parent fish are raised from eggs and eggs obtained from the parent fish are hatched, and now, with the aim of establishing a mass production system for the commercialization of eel seeds, initiatives are being taken to develop feed conducive to good growth and survival and breeding tanks with high productivity through industry-academia-government collaboration in other fields.

(Promotion of conservation of inland water fisheries)

Inland water fisheries in rivers and lakes are indispensable for people's living, not only providing edible and ornamental fishery products as production sites for fisheries and aquaculture but also providing places to have contact with nature such as fishing and recreation. However, the fishing ground environment and biodiversity in inland waters have deteriorated due to the deterioration of habitats and growth environments for aquatic flora and fauna caused by the influence of establishments in rivers and the decrease in water quality, as well as due to feeding damage by Great Cormorants and alien fish.

To this end, the government will utilize the Council based on the "Act on the Promotion of Inland Fisheries" (Act No. 103 of 2014) to establish a system in which efforts toward the restoration of the inland water fishing ground environment are promoted through mutual understanding between inland water fisheries cooperatives and river administrators, etc., as well as to proceed with the development of effective population management methods for Great Cormorants and control of alien fish, etc. By utilizing these methods, the government will promote control activities by inland water fisheries cooperatives. In addition, the government will promote efforts of stock enhancement while taking into consideration the conservation of biodiversity in inland water fisheries through the development of stock enhancement methods in consideration of the fishing ground environment as well as the improvement of spawning grounds and seeding production facilities.

With regard to eels, there is a licensing system for eel aquaculture by the Minister of Agriculture, Forestry and Fisheries in accordance with the "Act on the Promotion of Inland Fisheries," and the government will strictly control the upper limit of the number of juvenile eels entering the ponds agreed between the relevant countries and regions that share Japanese eel resources, and promote measures such as the protection of eel resources that descend from rivers into the sea. Moreover, efforts will be made to prevent poaching and the distribution of illegal catches by strengthening penalties for glass eel poaching along with the revision of the Fisheries Act in 2020, and by designating glass eels as class I specified aquatic animals and plants in the "Act on Ensuring the Proper Domestic Distribution and Importation of Specified Aquatic Animals and Plants" (applicable from December 2025).

4) Prevention of damage to agriculture, forestry, and fisheries through proper management of wildlife [Targets 4, 6, and 9]

(i) Promotion of the reduction of damage due to wildlife and the development and conservation of Satochi-Satoyama areas

Much wildlife inhabits Satochi-Satoyama areas, each of them having an important role in the ecosystem. They have been closely related to human living and have been used as necessary resources. In addition, humans have been in contact with living nature through activities such as wildlife observation. On the other hand, as symbolized by the boar embankment (*shishi-dote*) or boar hedge (*shishi-gaki*) used from

ancient times by farmers to protect harvests, there have been agricultural damages caused by wild boars and other animals. Recently, with the decline of human activities in Satochi-Satoyama areas, an increase in abandoned cultivated lands, a decrease in the number of hunters, and the trend toward less snow due to global warming, wild boars, Sika deer, and other wildlife have expanded their habitat ranges. They are having a serious impact on the lives of people in rural areas and communities although the cost of damage to crops caused by wildlife is on the decline.

Basically, wild animals are timid and are afraid of humans. They tend to hide in places like neighboring bushes in order to enter agricultural lands. In order to prevent damage due to wildlife, it is important to manage the habitat environment that allows humans and wild animals to maintain a reasonable distance and build an adequate relationship. For this reason, it is necessary to take comprehensive countermeasures in conjunction with the prevention of damages and regulation of wildlife population sizes.

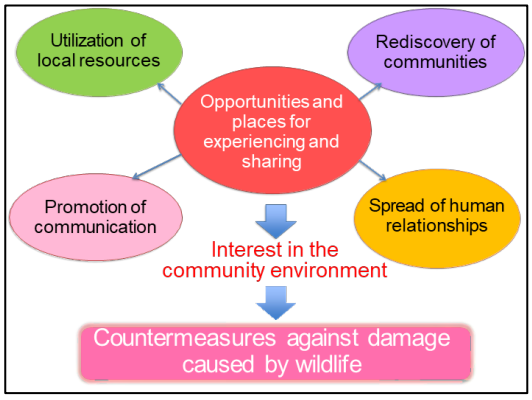
Therefore, a regional system will be developed with the promotion of the preparation of a damage prevention plan by municipalities based on the "Act on Special Measures for Prevention of Damage Related to Agriculture, Forestry and Fisheries Caused by Wildlife" (Act No. 134 of 2007), which was revised in 2021. In addition, based on said plan, the government will comprehensively support measures jointly implemented by the community, such as habitat environment management through the development of buffer zones, including bush cutting in areas neighboring agricultural land, the prevention of damages by installing guard fences, and the regulation of wildlife population sizes in order to maintain adequate habitat density.

In particular, damages to agriculture and forestry caused by overpopulated wildlife like Sika deer and wild boars are becoming serious, posing a threat to biodiversity conservation. In order to ensure the effectiveness of regulating wildlife population size, the government will improve and reinforce countermeasures against the expansion and worsening of damages, including the development and securing of hunters who capture wild animals through the establishment and promotion of teams for implementing measures to prevent damage due to wildlife, reinforcement of the animal capture system through support for activities, promotion of wide-area capture in cooperation with each prefecture and municipality, promotion of measures utilizing new technologies such as ICT, and development of human resources with expertise in wildlife management. At the same time, in order to effectively use captured birds and animals as local resources, the government will promote the development of incineration disposal facilities, the promotion of adequate utilization of captured wildlife like Sika deer and wild boars as edible meat through the development of sales channels and new products, and the development of human resources for captors and those engaged in processing facilities.

Promotion of community-wide measures against damage caused by wildlife through "experience" and "sharing"

The community of Kamisanko in Shibata City, Niigata Prefecture, established "Kamisanko Seiryu no Kai" (Kamisanko Seiryu Association) in 2012, and the whole community is working on countermeasures against damage caused by wildlife under the theme of "sustainable farming village."

With the keywords of "experiencing" and "sharing," they have succeeded in encouraging village residents, including non-farmers, to cooperate in countermeasures against damage caused by wildlife, by raising awareness for the village environment through agricultural experience exchanges and the utilization of GIS.



Source: Lecture materials at the Kamisanko Seiryu no Kai of the Eighth National Wildlife Damage Control Summit

(ii) Promotion of forest damage control caused by wildlife

Regarding the damage to forests caused by wildlife, including Sika deer, the impact on the multifunctional roles of forests is a cause of concern, such as the feeding damage of understory vegetation in addition to feeding damage to planted trees, runoff of soil due to trampling, and the disappearance of precious alpine plants. As such, effective countermeasures are required.

Consequently, based on the coordination with policies for wildlife conservation and management as well as the status of damages caused by wildlife and their inhabitation status, the government promotes countermeasures against the damage to forests widely and effectively, including active population control and damage prevention, while also introducing ICT that will help reduce costs and labor. In addition, it is necessary to properly promote countermeasures that take coexistence with wildlife into consideration, including the transition to mixed forests of conifers and broadleaf trees or broad-leaved forests, which considers habitat environments for wildlife based on the actual local situations.

In national forests, efforts will be actively promoted, such as capturing Sika deer in cooperation with the local concerned governmental agencies, based on the monitoring surveys of Sika deer inhabitation and damage, and also regeneration and restoration of forests will be promoted as needed.

(iii) Promotion of measures against damage to fisheries caused by wildlife

Some of the organisms that make up the marine ecosystem are wildlife that can damage fisheries and aquaculture, causing damage to fishing gear and feeding damage to catches of fish, while measures considering biodiversity are needed, such as avoiding the extinction of said species.

In particular, there are many cases where marine animals such as Steller sea lions damage fishing gear in the waters around Hokkaido, appropriate conservation and management countermeasures will be implemented based on the latest scientific knowledge, including the management of the number of migrating Steller sea lions based on scientific grounds, in order to both avoid their extinction and reduce damage in fisheries.

In addition, the giant jellyfish generated in large quantities in the East China Sea and adjacent waters migrate to the waters around Japan, bringing significant damage to fisheries. As for giant jellyfish that appear in wide areas, surveys on jellyfish occurrence are being conducted, and appropriate measures such as effective extermination will be taken.
As for Great Cormorants, the government will promote damage control measures by developing and diffusing effective population management methods, such as placing dry ice on nests by using drones to control breeding, and by supporting inland water fisheries cooperatives engaged in control activities. Moreover, since Great Cormorants migrate and breed over a wide area, the government will reinforce damage control measures by promoting wide-area collaboration with the Ministry of the Environment as well as prefectural and other local governments, and by efficiently and effectively implementing various measures, mainly capturing cormorants, across the country.

(iv) Prevention of entrenchment of alien species

(Measures against alien species based on the Act on Alien Species, etc.)

As for the measures to prevent damage to agriculture, forestry, and fisheries caused by wildlife, alien species may become the target, and it is important to take action as soon as possible because, for example, there are many species that show vigorous fertility due to no natural enemies in Japan, which tend to bring severe damage.

Measures against alien species are implemented based on the “Act on the Prevention of Adverse Ecological Impacts Caused by Designated Invasive Alien Species” (Act No. 78 of 2004, hereinafter referred to as the “Act on Alien Species”), and the government is striving to prevent damage by designating as invasive alien species those that harm or can potentially harm the ecosystems, human life and bodies, and agriculture, forestry and fisheries. It should be noted that, even among alien species that are not designated as invasive alien species, there are some species that have already harmed or are likely to harm agriculture, forestry, and fisheries, and ecosystems.

In the Aichi Biodiversity Targets, an individual target of “identifying and prioritizing invasive alien species and their entrenchment pathways by 2020, and controlling or eradicating species with high priority” was presented, and in the national strategies, “formulating the ‘Alien Species Damage Prevention Action Plan’ (tentative name) to organize the concept of control priorities, promoting planned control, etc., and encouraging each entity to take action on countermeasures against alien species and to take voluntary initiatives at the local level” and “preparing a list of not only invasive alien species under the Act on Alien Species but also invasive alien species that harm or are likely to harm the ecosystems, etc. in Japan” were identified as some of the national targets.

In response to this, in March 2015, the government published the “action plan for prevention of damage by alien species” and the “list of alien species that may pose risks to ecosystems in Japan” (list of alien species to prevent ecological damage).”

Since the collaboration among various parties involved in the measures against alien species is important, the government will promote the countermeasures against alien species by utilizing the “list of alien species to prevent ecological damage,” and by calling on various parties, including relevant ministries, local governments, business operators, NPOs, and citizens to increase their awareness and understanding of alien species and take appropriate action.

(Prevention of damage to agriculture and forestry)

Alien species like raccoons not only cause damage to agricultural, forestry, and fisheries products, but also pose threats to the ecosystems of Satochi-Satoyama areas. Therefore, regarding these invasive alien species, their capture will be promoted, with the intention of eradicating them, through the confirmation and approval of the pest control implementation plan created in accordance with the Act on Alien Species.

For alien species that cause water flow problems in agricultural water channels, such as golden mussels and Asian clam, the government will promote the development of methods to eradicate them in entrenched areas, as well as early detection methods to prevent the expansion of their distribution. In addition, the government will promote the development of efficient control technologies using chemical agents, and the development of management technologies to prevent the spread of invasive weeds, such as bur cucumbers and *Alternanthera philoxeroides*.

Moreover, with regard to pests that damage crops, such as *Pomacea canaliculata* and *Aromia bungii*, the government has conducted tests and research on their ecology and control methods, made control countermeasures known to the public, and provided support for control measures implemented by prefectures. Timely and appropriate control of them will be continuously promoted in collaboration with prefectural and other local governments. Furthermore, with regard to alien species that threaten endemic forest ecosystems, the government will take countermeasures to eliminate them through adaptive management and to prevent the expansion of their habitat ranges while taking into account the current impacts on the ecosystem.

(Prevention of damage to fisheries)

For alien species that damage inland water fisheries, the government will assess their inhabitation and develop and disseminate effective control methods according to their habitat environment and habitat density. As for invasive alien species (largemouth bass, smallmouth bass, bluegill) that are to be controlled by the Fisheries Agency, damage control measures will be promoted by supporting inland water fisheries cooperatives working to control these species. In addition in lakes and marshes where largemouth bass had been designated under the class 5 common fishery right even before they were designated as an invasive alien species, breeding them for the maintenance of a livelihood is permitted as an exception, and they are used for recreational fishing. Therefore, in these lakes and marshes, the local endemic ecosystem will be conserved and restored by, for example, working with relevant organizations to explore ways of subsistence that do not depend on alien species.

(Prevention of invasion into Japan)

As for pests that may harm useful plants such as crops, in order to prevent their entry into Japan, the plant protection station conducts inspections (import plant quarantine) at ports, airports, etc. on plants, etc. and their containers or packages that are imported as cargo, personal belongings, or postal items.

Even for those other than the pests subject to quarantine, when organisms suspected to be designated invasive alien species, etc. are found in import plant quarantine, the plant protection station contacts Customs and the Ministry of the Environment in response to a request for cooperation from the Ministry of the Environment.
The invasion of the pests, etc. will be continuously prevented through these efforts.

(Prevention of entrenchment of alien species used in agriculture, forestry, and fisheries)

With regard to alien species used in agriculture, forestry, and fisheries, some species are classified into “industrially managed alien species” as invasive alien species in the “list of alien species to prevent ecological damage,” and measures are required to prevent their spread and entrenchment into the habitats and nursery areas of indigenous species, including their transformation to indigenous species.

Regarding the buff-tailed bumblebee used for pollination of farm crops, it has been designated as an invasive alien species, and transformation to an indigenous species is encouraged. When using it out of necessity, adequate management will be required with measures such as setting double doors for the entrance to the facility so as to prevent the spread into the habitat ranges of indigenous species.

When using alien plants in revegetation works projects such as greening works, the basic principle is to avoid species listed on the “list of alien species to prevent ecological damage,” including invasive alien species. When no alternative species exists, measures to prevent the spread of their habitats will be promoted while considering the impacts on the current ecosystem.

For exotic grasses, the government will promote measures to prevent impacts on the ecosystem, such as preventing the spread of habitats from mowing and grazing lands and preserving indigenous species.

With regard to industrially managed alien species such as brown trout, the government will promote initiatives to prevent the expansion of their habitat ranges in collaboration with relevant parties, since the broad contribution of these species to the revitalization of not only the fishing industry but also the local economy despite a risk of damage to the ecosystem.

(2) Assist the production frontline by efforts throughout the supply chain

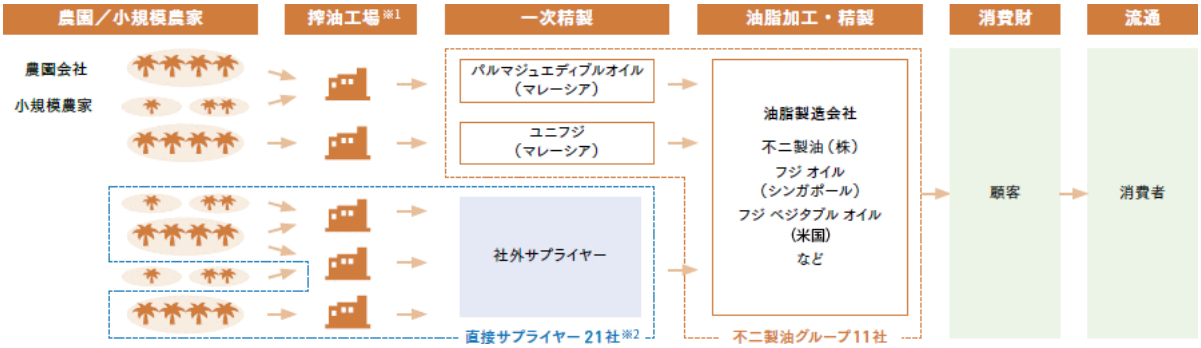
1) Establishment of biodiversity-conscious systems of procurement, distribution, consumption, and resource circulation [Targets 7, 15, 16]

As the people in Japan are becoming more diverse in their value systems and more interested in healthy eating habits and sustainable production and consumption, the business community has come to regard sustainability efforts as a major criterion in corporate rating and ESG financing. For food companies in particular, it is important for their market valuation to conduct business activities in line with internationally prevailing sustainability practices. The Ministry of Agriculture, Forestry and Fisheries is also aiming to realize sustainability-conscious procurement of imported raw materials by food companies by 2030.

Initiatives for sustainable palm oil procurement based on responsible procurement policies

Palm oil is easier to process and yields more per unit area than other vegetable oils, and so it is used widely in the food and chemical industries. It ranks first among the world’s production of vegetable oils and fats. However, palm production is not free from concerns over deforestation by plantation development and human rights abuses such as forced labor and child labor.

In March 2016, the Fuji Oil Group formulated the Responsible Palm Oil Sourcing Policy stating no deforestation, no new development of peatlands, and no exploitation of indigenous peoples in the palm oil supply chain. Its efforts with specific targets for 2030 were recognized in the form of Minister of Agriculture, Forestry and Fisheries Award at the 22nd Green Purchasing Awards.



Source: Fuji Oil Group official website

(Recycling of plastic resources in food, agriculture, forestry, and fisheries)

In recent years, there have been concerns about the impact of plastic waste on biodiversity, including the rapidly rising problem of marine plastic waste. Discharge reduction and recycling of plastic waste are important, also from the perspective of biodiversity conservation.

In agriculture, plastics are used as farm production inputs, including covers for plastic greenhouses and hoops, for mulching, as silage wrap for livestock farming, and as film coating of fertilizers. The plastics problem needs to be addressed appropriately in agriculture, too.

Agricultural input suppliers and others have been voluntarily engaged in initiatives to help solve the marine plastic problem, such as the appropriate treatment of used agricultural films, promotion of the use of biodegradable mulch, and prevention of the outflow of plastic-coated fertilizer shells. In addition, based on the Basic Policy on the Appropriate Treatment of Plastics Used for Greenhouse Horticulture, administrative agencies and farmers' organizations are involved in the promotion of appropriate treatment, being aware that farmers, who discharge the waste, are generally small in scale while the plastic waste is generated in vast and dispersed areas. We will continue to hold regional block council meetings and prefectural council meetings throughout the country to promote sharing of information and local challenges and to ensure that the pertinent laws and regulations are duly understood.

The food industry uses a wide variety of plastic products, such as PET bottles, trays, and cutlery. In particular, containers and packaging are being used increasingly for essential uses, due to the impact of the novel coronavirus. In accordance with the Resource Circulation Strategy for Plastics and the Act on Promotion of Resource Circulation for Plastics (Act No. 60 of 2021), the government will promote efforts of circulating plastic resources (Reduce, Reuse, Recycle, Renewables) at each stage of manufacturing, sale, and waste discharge in the food industry.

Specifically, the government will promote initiatives in the food industry, such as promoting environmentally friendly design of plastic products in the food industry, reducing the use of one-way plastics the restaurant industry provides free of charge, and voluntary collection and recycling of plastics by retailers and other waste-generating businesses.

As part of measures to address the problem of marine plastic waste, the government will help ensure appropriate disposal of waste generated by fishing by promoting planned disposal of fishery waste by fishermen and others as well as the development of marine biodegradable plastics for fishing gear and other items that do not necessarily require high strength or durability. In collaboration with the Ministry of the Environment, in addition, we will promote the establishment of a framework by which fishermen would collect marine debris during their operations and bring it back for disposal by the local government.
Further, based on the Plastic Resource Circulation Act, the government will promote the reduction and recycling of plastic product industrial waste through guidance and advice to discharging operators of the food, agriculture, forestry, and fisheries industries and recommendations, announcements, and orders to large-volume discharging operators.

“Setouchi Oceans X” aims to reduce marine litter in the Seto Inland Sea

In December 2020, the Nippon Foundation and the four prefectures of Okayama, Hiroshima, Kagawa, and Ehime, which face the Seto Inland Sea, joined forces to launch the Setouchi Oceans X, a five-year project to combat marine litter.

Setouchi Oceans X aims to reduce the amount of marine litter flowing into the Seto Inland Sea, increase the amount collected, and show a Seto Inland Sea Model to the rest of the world for measures against marine litter with an eye toward a recycling-oriented society. The project has four pillars: “research,” “business-community collaboration,” “awareness, education, and action,” and “policy formulation.”

(Promotion of the distribution of wood and wood products with consideration for multiple functions of forests.)

Since the distribution of illegally harvested wood may have adverse effects on multiple functions of forests, including biodiversity, the government will require confirmation of legality by wood-related business entities in accordance with the Act on Promotion of Distribution and Use of Legally-harvested Wood and

Wood Products (Act No. 48 of 2016) (commonly known as the "Clean Wood Act"), and will promote the dissemination of legally harvested wood, etc. to consumers, etc.

(Certification system to support preferred procurement from producers committed to biodiversity conservation)

In order to support preferred procurement of wood from producers committed to biodiversity conservation, the government will promote a forest certification system that will encourage consumers to selectively purchase wood and wood products (certified wood) from forests certified based on certain criteria for forest management.

In addition, the government will cultivate better recognition among consumers of the fisheries eco label attached on marine products caught with consideration to the sustainability of ecosystems and resources, and promote the use of the certification system by producers and distribution and processing operators.

(Initiatives to reduce business-derived food loss and waste)

There is concern in the world from a biodiversity and climate change perspective about the deforestation of forests and large-scale monoculture agriculture to meet the growing demand for food.Japan depends on foreign countries for most of its domestic food needs. Reducing food loss and waste from the food industry is important, also from the perspective of biodiversity conservation.

For this reason, the manufacturers, wholesalers, and retailers will jointly work to alter their business practices that tend to generate food loss and waste in the supply chain. The efforts include relaxation of delivery deadlines, the easing of expiry date labeling, and extension of expiry dates. Supported by the understanding and cooperation of both food businesses and consumers, in addition, the government will promote bring leftovers home and sale of seasonal foods in quantities just enough to satisfy true demand.

Through these initiatives, we aim to reduce business-derived food loss and waste to half the FY 2000 level by FY 2030.

Furthermore, we will work to minimize business-derived food loss and waste by 2050, through technological advances such as AI-based demand forecasting and development of new packaging materials.

(The role of financial institutions in the supply chain)

Financial institutions play an increasingly big role in mainstreaming biodiversity in the supply chain.

As shown in the "Dasgupta Review" published by the UK HM Treasury in February 2021, the relationship between biodiversity and the economy will become even closer in the future from the perspective of the planetary boundary, and the respective roles of actors in the supply chain will become more important. As the SDGs become more widespread in the world, high expectations are emerging that sustainable finance that includes ESG elements will contribute to achieving the goals.

As ESG finance continues expanding rapidly, financial institutions, including institutional investors, are expected to duly evaluate companies that sustainably conduct environmentally friendly management, including biodiversity efforts, and to expand their investments and loans to such companies. In addition, international discussions are accelerating on disclosure of biodiversity information for use by investors in their company evaluation.

In light of these trends, research and development will be carried out on methods to monitor, evaluate, and disseminate biodiversity initiatives at each stage of production, processing, and distribution. In parallel, the domestic distribution and import/export of food, materials and supplies, and raw materials will be studied, and efforts will be made to make policy approaches greener with a view to increasing investment opportunities in the agriculture, forestry, and fisheries industries in Japan.

Turning to domestic trends, an increasing number of financial institutions have introduced environment-rated loans by assessing the environmental activities of the borrower to determine loan eligibility, applicable interest rates, and other conditions.

Some regional banks, Shinkin banks, and other local financial institutions see biodiversity and other environmental issues as seeds for industrial growth, and have begun to engage in environmentally friendly businesses on their own in collaboration with local governments and companies.

With this trend in mind, the government will promote efforts to support environmentally- friendly production and business activities through loans and other means, and will seek out and disseminate pioneering good practices in order to encourage local initiatives elsewhere.

2) Promote understanding of biodiversity and behavioral change [Targets 9, 12, 14, 15, 16]

(Promoting understanding of environmentally friendly agriculture)

The MIDORI Strategy calls for promoting initiatives to reduce the use of chemical fertilizers and the risk-weighted use of chemical pesticides and to expand the cultivation area of organic agriculture.

In order to secure consumers' understanding, interest, and trust in organic farming and other environmentally friendly agriculture, the government will assist municipalities that work on a community-wide basis, from the production of organic agriculture to the consumption of organic agriculture, including its use in school lunches. At the same time, we will work with retailers and food and beverage businesses that handle domestically produced organic food products, to promote efforts to stimulate demand so that consumers can gain an understanding of organic agriculture initiatives that contribute to the achievement of the SDGs as well as the agricultural products produced there. In addition, the government will promote building of networks to encourage interaction and collaboration among local governments that utilize organic agriculture to promote regional development. We will strive to provide necessary support so that good practices of initiatives that support organic agriculture in local communities can be shared and the public can be informed of such initiatives.

We will foster consumers' understanding about agricultural products produced in compliance with the organic JAS which are produced in fields that adopt environmentally friendly cultivation methods that minimize the environmental impact of agricultural production as much as possible for the purpose of maintaining and enhancing the natural circulation function agriculture, based on avoidance of the use of chemically synthesized fertilizers and pesticides.

Proactive use of organic agricultural products in school lunches

The city of Usuki in Oita Prefecture is promoting environmentally friendly "Honmamon agriculture," which does not rely on chemical fertilizers or pesticides and conserves farmland and the surrounding ecosystem. In FY 2010, the city established the Usuki City Soil Preparation Center to produce Usuki Yume Compost from plants and trees (80%) and pig feces (20%). Also, the city operates a certification system of its own, whereby the mayor certifies agricultural products grown in fields without chemical fertilizers or pesticides as Honmamon Agricultural Products.
It is also working to create an environment in which organic farming is economically viable by securing sales networks. It supports initiatives to promote local production for local consumption, such as promoting the use of local food materials in restaurants and school lunches in the city. In the elementary and junior high schools in Usuki, about 40% of the vegetables used in school lunches are locally grown with the cooperation of about 70 farmers there.

(Promotion of Shokuiku (food and nutrition education) and agricultural, forestry, and fishery experience)

Education and learning are important to deepen understanding and knowledge of biodiversity and to induce behavior change. It is especially important to learn and experience nature and living things through school education and immersion in nature.

The Fourth Basic Plan for the Promotion of Shokuiku aims to promote Shokuiku as a national campaign, with diverse stakeholders deepening mutual understanding, cooperation, and collaboration based on the ideas of the SDGs, in order to realize healthy dietary habits of the citizenry and a sustainable society that is conscious of the environment and food culture.

Since it is necessary to take into consideration the environmental impact of the cycle from food production to consumption on the environment, the government will promote Shokuiku on environmentally friendly

food production and consumption ; with special regard for education and piquing the interest of citizens in food production methods that are highly effective in preserving biodiversity conservation and promoting ethical consumption that leads to sustainable food systems.

Because it is today rather difficult to see the activities of agriculture, forestry, and fisheries and their relationship with living creatures, the government will promote hands-on activities related to agriculture, forestry, and fisheries that not only deepen interest and understanding of the production of agricultural, forestry, and fishery products, but also gain a better understanding of how nature and supported by diverse activities of the people involved.

The use of local products contributes also to the reduction of environmental burden by distances between production and consumption areas and curbing the amount of carbon dioxide emissions associated with their transportation. In addition, in order to promote the use of local agricultural, forestry and fishery products at farmers' markets, etc., the government will promote the establishment of a production and supply system for various items and the development of processed products, as well as the establishment of a system for stable production and supply of local agricultural, forestry, and fishery products in school lunches and company cafeterias, thereby expanding the use of local agricultural, forestry, and fishery products.

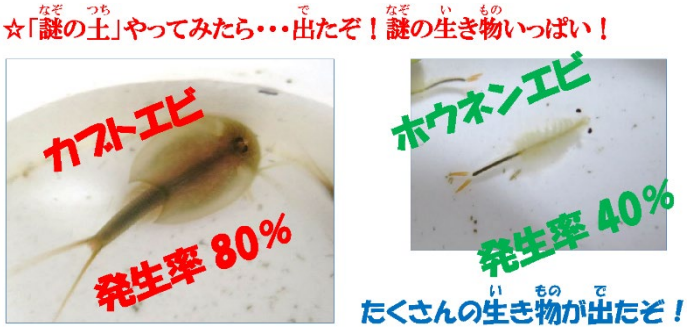
Furthermore, due to diversification of lifestyles, the excellent washoku(the traditional food culture of Japan) culture have been fading with time and their unique characteristics lost . The government will promote washoku school lunches and otherwise encourage activities to pass down to the next generation the traditional local food cultures. The protection and inheritance of food culture is important in supporting the cultural richness of dietary habits and also contributes to reducing the burden on the environment and realizing a sustainable food supply. Efforts will be made to have the child-rearing generation better understand the goodness of food culture and put it into practice at home. By the same token, stories and value-added information about local food culture will be centrally and systematically put together and disseminated in an easy-to-understand manner.

National forests with excellent natural landscapes and suitable for forest bathing, nature observation, and forest sports are designated as "recreational forests." In addition, the government is promoting "the development of forests with public participation under contract" by concluding agreements with private organizations that wish to develop forests on their own and providing them with a forest field. In addition, the government will promote the establishment of "corporate forests," which enable companies and other entities to establish forests as a place for social contribution, employee education, or interaction with customers by entering into a shared forest collection agreement with the government.

Sumiyoshi Scarecrow Project: Learning about life in rice paddies and agricultural culture through rice farming experience

Sumiyoshi Taisha Shrine in Osaka City has run the Sumiyoshi Scarecrow Project since 2013. Participating kindergartens and elementary schools in the area receive the same rice seedlings that are used in the Shrine's Otaue Shinji ritual (sacred rice planting), an important intangible folk cultural property of Japan. The students grow the rice in the school garden and learn how to make scarecrows and study the creatures that inhabit the rice paddy. In addition to the rice seedlings, the Shrine distributes dried soil of its sacred rice paddy under the name of "Wonder Earth." When mixed in water, various aquatic life emerges. The students are excited to observe them, and in this way, they learn the interaction between rice farming and the ecosystem. Through this project, Sumiyoshi Taisha aims to contribute to the achievement of the SDGs by working to preserve the sacred rice paddy environment and preserve traditional culture.

Watering the Wonder Earth for observation



Project newsletter, Onda Tsushin, reports findings of a questionnaire survey.

(Promotion of sustainable production and consumption)

The efforts of national and local governments alone are not enough for successful promotion of sustainable consumption in the agriculture, forestry, and fisheries sector. It is important to disseminate information, including efforts at retail stores, with the cooperation of producers and companies that constitute the supply chain. For this reason, it is necessary for various actors to work together and combine their strengths, such as technology and information, in order to realize it as an initiative of the entire society.

Therefore, with the aim of achieving the SDGs by 2030, we have launched SCAFFF2030 ---- Sustainable Consortium 2030 for Agriculture, Forestry, Fisheries and Food (in Japanese "afunowa2030") through collaboration among the Ministry of Agriculture, Forestry and Fisheries, the Consumer Affairs Agency, and the Ministry of the Environment. The consortium of companies and organizations is engaged in actions to achieve food and agricultural sustainability. Using this as a platform, we will promote dialogue with diverse stakeholders, encourage the transformation of values and behaviors from consumption to sustainability-oriented consumption, and work to promote sustainable production and consumption.

In the Basic Policy pursuant to the Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Act No. 100 of 2000) (commonly known as the "Green Purchasing Act"), the use of organic produce in cafeterias by the State and other entities has been added as an item to be considered. Accordingly, the Ministry of Agriculture, Forestry and Fisheries will take the lead in promoting the use of organic produce in its cafeterias, and through these initiatives, will contribute to the expansion of demand for environmentally friendly agricultural, forestry, and fishery products, including organic produce, and the sustainable development of food, agriculture, forestry, and fisheries.

(Promoting understanding of the function of agriculture and rural areas)

For the conservation and management of rural spaces as commonly-shared assets of all the people in Japan, support will be extended to the groundwork and other cooperative efforts by communities, private companies, and government agencies to make better use of the rural environment or to use rural areas as places for education, tourism, and other activities, availing themselves of the rich biodiversity and other

local resources. In addition, the government will support efforts to create communities that would be able to take advantage of the food culture and beautiful landscapes of the rural areas and respond to the changing needs of the society in the wake of COVID-19. Through these measures, the government will promote the understanding of the general public about the roles the agriculture and rural communities play in biodiversity. In parallel, it will promote exchanges between urban and rural areas as well as the creation, growth, and settlement of people through countryside stay, etc. At the same time, the government will promote urban agriculture, in which urban residents can easily participate.

Furthermore, the government will make use of systems that evaluate regional efforts regarding biodiversity conservation including the FAO's Globally Important Agricultural Heritage Systems (GIAHS) view to promoting the diverse values of agriculture, forestry, and fisheries in Japan, both at home and abroad and to revitalize rural areas.

(Promotion of understanding of measures against wildlife damage)

We will inform the general public widely of the current situation and countermeasures taken against damage to agriculture, forestry, and fisheries caused by wildlife.

In particular, the damage caused to agriculture and forestry by excessively increasing wildlife such as wild boars and Sika deer has become serious in recent years, posing a threat to biodiversity conservation. In addition to various countermeasures such as development and securement of wildlife hunters, efforts for utilization of captured wildlife as regional resources are promoted, which include promotion of adequate utilization of captured wildlife as edible meat, development of human resources with knowledge of hygiene management for hunters and those engaged in processing facilities, and branding of wildlife meat (game meat).

(Promotion of the development of forests with public participation)

There is a need to increase public understanding and interest with respect to the roles of forests and forestry in building a sustainable society and the significance of wood use. Efforts will be made to promote forest development activities by diverse players through the networking of companies, NPOs, and others and to hold greening events to raise awareness among the public. At the same time, in order to promote forest environmental education and "Mokuiku" (wood use education), the government will provide opportunities for a wide range of hands-on activities such as nature nurturing through the use of nearby forests, provide information on places for hands-on activities, strengthen cooperation with educational institutions, and provide future forestry workers with hands-on learning experiences about forestry.

(Promotion of understanding of conservation of fishing grounds and ecosystems in inland waters)

Fisheries cooperatives that hold the inland water fishing licenses manage the sustainable use of their fishing ground rivers and lakes, including breeding of fishery resources through releases and improvement of the river environment. These cooperative activities play a major role in the conservation of inland water ecosystems. Rivers, lakes, and marshes are indispensable for the public as places to enjoy nature, such as fishing and recreation, and the understanding and cooperation of the public as users are essential for their good conservation and management. The government will promote awareness activities by fisheries cooperatives in order to widely spread the public understanding of the importance of inland water ecosystems and the activities of fisheries cooperatives responsible for their conservation and restoration.

3. Promotion of conservation and use of agricultural, forestry, and fishery spaces

Agriculture, forestry, and fisheries spaces in Japan are natural environments that are maintained through agricultural production activities and other human intervention. The promotion of rural areas through agriculture, forestry, and fisheries is important from the perspective of achieving multifunctionality that include the preservation of a rich natural environment, biodiversity, and formation of good landscape. Human activities of the agriculture, forestry, and fisheries industries protect the landscape and maintain biodiversity.

However, the deterioration of community functions resulting from the progress of depopulation, aging, and mixed habitation has made it difficult to adequately maintain and manage the local farmland,

channels, farm roads, and other local infrastructure. In this way, full performance of the multifunctionality is prevented. We need to develop measures that would address this difficulty adequately. The development of these measures and the resolution of environmental and social issues that we face require us to deal with them on the basis of nature-based solutions (NbS). We must pass on to the next generation the rich nature without degradation and rather, with further accumulation.

The “30 by 30” Target of the Kunming-Montreal Global Biodiversity Framework; that is, to conserve and manage at least 30% of land and marine and coastal areas by 2030 as protected areas and OECMs, is to be achieved in conjunction with the broader landscape and seascape efforts, and accompanied by targeted sustainable management of agriculture, forestry, and fisheries in the area.

(1) Securing and developing human resources for the conservation and use of agricultural, forestry, and fisheries spaces (Targets 1, 2, 3, 10, 22, 23)

(Measures for farming village areas)

Support will be provided for the continuation of appropriate agricultural production activities in hilly and mountainous areas, from the perspectives of preventing increase of abandoned farmland and securing multifunctionality. Likewise, support will be extended to joint community-wide cooperative activities from the perspective of conserving and improving the quality of local resources, such as farmland and water for agriculture. In addition, we will support the groundwork and other joint activities by communities, private companies, and the government to make use of the rural environment. Also, we will support community-wide initiatives that utilize the rich biodiversity and other local resources in making agricultural, forestry, and fisheries villages places for education, tourism, and other activities. In addition, the government will support efforts to create communities that would be able to take advantage of the food culture and beautiful landscapes of the rural areas and respond to the changing needs of the society in the wake of COVID-19. Through these measures, the government will promote the understanding of the general public about the roles the agriculture and rural communities play in biodiversity. In parallel, it will promote exchanges between urban and rural areas as well as the creation, growth, and settlement of people through countryside stay, etc.

In addition, the agriculture, forestry, and fisheries workers are expected to further age and decrease in number. For the sustainability of the primary industry, it is important to expand the human resource base that sustains the rural areas. Therefore, the government will work on strengthening career education at universities, etc., as well as developing and securing new employees in agriculture, forestry, and fisheries, promoting diverse farm management styles, including half-farming and half-X, and developing systems and human resources to support the area. In particular, it is important to have the views of women, who have the perspective of consumers, reflected in the formulation of local policies, in order to ensure the sustainability and diversity of agriculture, forestry, and fisheries, and rural and fishing villages. Therefore, the government will promote the development and promotion of leading female agriculture, forestry, and fishing workers, and the creation of an environment in which women can be more active through the “Nougyou-Joshi” (Women Farmers) Project and other measures. Furthermore, we will promote the social implementation of smart agricultural technologies such as automatic grass cutters and automatic water management systems, which would lead to a significant reduction in working hours.

Securing a local workforce through enhancement of "half-farmer, half-X" workstyle

Regarding the agricultural production front, some local governments have taken steps to spread the "Half-Farmer, Half-X" style of working that combines farm work with, for example, tourism, sake brewing, etc.

For instance, since FY 2010 Shimane Prefecture supports people relocating from outside the prefecture who work as Half-Farmer Half-X. Among those certified as such are "Half-Farmer, Half-Agricultural Employee (employed by an agricultural corporation)", "Half-Farmer, Half-Kurabito (employed by a sake brewery)", "Half-Farmer, Half-Service Provider (working at a Michi-no-Eki, delivering newspapers, etc.)" and "Half-Farmer, Half-Self-employed (gardener, plasterer, photographer, etc.)"

A half-farmer, half-X worker (a farmer and sake brewery employee in Shimane Prefecture)

(Measures for mountain village areas)

Mountain villages in Japan, while accounting for only 2.5% of the population, represent about 50% of the country's land area and about 60% of its forest area. They play an important role in improving the lives of the people by supplying agricultural and forestry products, and serving a public interest by recharging water sources and mitigating climate change, as well as by developing a distinctive local culture linked to the diverse natural environment.

However, mountain villages are becoming increasingly depopulated and aging, and problems such as deforestation due to workforce shortage have arisen. It is necessary to secure workforce and maintain the vitality of mountain village areas in order to develop and conserve forests and conserve biodiversity.

For this reason, the government will promote migration and settlement by securing new entrants into the industry through the "Green Employment" program and other measures. Simultaneously, it will help create new values in mountain villages by promoting integrated agriculture and forestry management and "forest-related service industry" that takes advantage of the natural, cultural, landscape, and other resources rich in biodiversity in mountain villages.

(Measures for fishing village areas)

In the face of declining and aging population of fishing villages that could weaken their vitality and hinder their ability to display their multiple functions, the government will seek to secure new employees through training support for those who wish to work in the fishing industry. In addition, it will promote the creation of an environment in which women can be more active in the fishing and fisheries industries through the "Ocean Treasure! Suisan-joshi Genki Project."

(2) Promotion of conservation and use of agricultural, forestry and fishery spaces (Targets 1, 2, 3, 10, 11)

(Measures for revitalization of rural areas)

In order to conserve biodiversity in rural areas, a variety of activities are being carried out, including the practice of community-wide organic agriculture to revive native species, efforts to preserve irrigation ponds as biotopes in farmland development, the conservation of agricultural land and water, the construction of paddy fishways and habitats for migratory birds, efforts to develop buffer zones to reduce wildlife damage, the creation of forests, the planting of trees to preserve fishing grounds, and the maintenance and management of seaweed beds and tidal flats.

Various efforts to conserve biodiversity through agriculture, forestry, and fisheries in many parts of the country have also resulted in increased sales of agricultural, forestry, and fishery products and have

contributed to the revitalization of the agriculture, forestry, and fisheries industries and the rural communities.

Such broad biodiversity conservation efforts give momentum to community-wide efforts, because they involve not only those engaged in agriculture, forestry, and fisheries but also a wide variety of players, including local governments, NPOs, local residents, companies, and educational institutions, reflecting the unique characteristics of the area.

In addition, the government is working to prevent and eliminate idle cropland by conducting the usage survey and the survey on intended use as prescribed in the Cropland Act (Act No. 229 of 1952). Prevention and elimination of idle cropland contributes to biodiversity conservation such as preventing abandoned croplands, which are vulnerable to dominance of invasive plants in vegetation.

A sake brewery in Noto rehabilitates abandoned cropland by growing sake rice in an initiative called "Satoyama conservation."

The Noto region is one of the world's most valuable agricultural landscapes, having been designated as Japan's first GIAHS in 2011.

However, the growing number of abandoned cropland due to the aging of the population has become a problem in recent years.

With the aim of preserving the agricultural landscape of Noto, Kazuma Sake Brewery, based in Noto Town, Ishikawa Prefecture and founded during the Meiji Period, launched a project in 2014 to produce sake, starting all the way from turning abandoned cropland into paddy fields and growing rice there with partner farmers. Abandoned croplands from more than 100 landowners were leased and cultivated for growing raw material rice for sake.

By 2021, about 26 hectares of abandoned cropland (six times the area of Tokyo Dome) had been restored, and since that year the brewery sources all the rice it needs from the Noto area.

(Measures for the sustainable use of Satoyama forests)

A Satoyama forest is an important place in terms of biodiversity conservation, where a variety of wildlife adapted to its environment can live and grow through the addition of moderate intervention by the local residents, such as raking fallen leaves and picking firewood. It is also expected to serve as an easily accessible place for people to come in contact with and learn about nature. In addition, proper management will be ensured through active use of the local resources not only as wood for timber but also as renewable energy sources such as charcoal and firewood.

In recent years, however, depopulation and aging of rural areas and changes in people's lifestyles have reduced such utilization of Satoyama forests and accelerated plant succession, resulting in changes in the composition and diversity of species. It is necessary to promote new approaches to Satoyama forests by diverse actors.

For this end, we will promote the multifaceted and sustainable use of Satoyama forests by supporting forest creation, weeding, and thinning in cooperation with local communities, companies, NPOs, etc., and by studying measures to make better use of community-based forests.

In promoting these activities, it is necessary to work in an integrated manner to secure wood demand, including its use for biomass energy.

(Promotion of conservation and use of the fishing village environment)

Fishing villages not only operate fishing but also have multiple functions, such as the formation of a good natural environment and landscape, the inheritance of local cultural traditions, and the provision of comfort spaces for people. They offer places where people can learn the importance of nature, and so it is necessary to conserve and make good use of the fishing village environment. However, the multifaceted functions of fisheries and fishing villages can only be realized when people live in fishing

villages and the fishing industry is operated soundly. The government will promote exchanges and settlement between cities and fishing villages, such as “Seaside Stay”, hands-on learning, and contact with nature, to deepen people’s understanding and interest in fisheries and fishing villages for their revitalization. In addition, the government will promote the preservation and formation of good fishing village landscapes that are friendly to people, and the inheritance of historical and cultural heritage.

(3) Promotion of biodiversity conservation through forests, villages, rivers, and seas (Targets 10, 11, 12)

(Promotion of biodiversity conservation in rural areas)

Paddy fields have the aspect of being wetlands, which are important as habitats for waterfowl and various other creatures. The practice of winter flooding, which is a farming method to enhance biodiversity, is becoming widespread, and construction of paddy fishways to ensure continuity between channels and paddy fields for the passage of creatures is also underway. Children use these waterfront environments, such as paddy fields and channels, as places for learning and fun.

It is important to praise and support such local efforts, which will protect the lives and habitat of extremely rare creatures such as storks and ibises, expand the living space for a wide variety of familiar creatures in the region, and lead to the conservation of biodiversity in Japan as a whole.

To this end, while seeking to build consensus in the region, the government will promote the development of infrastructure for biodiversity conservation based on expert opinions, and will improve the environment of rural areas and Satochi-Satoyama, including the creation of spaces where people can come in contact with nature.
In addition, the government will promote environmentally friendly agriculture, including organic farming, and support the establishment and spread of cultivation techniques that contribute to biodiversity conservation. At the same time, the government will further encourage activities to enhance biodiversity conservation at local levels, such as deepening understanding and awareness about agriculture, forestry, and fisheries as well as biodiversity by using paddy fields and channels as a place to explore living creatures there and otherwise learn from and play in the waterfront environment, and offering more opportunities for people to interact with nature.

(Promotion of biodiversity conservation integrally in forests, villages, rivers, and seas)

As a fisherman/writer said, "The forest is a lover of the sea." Forests not only have the functions of recharging water sources and preventing sediment runoff, but also contribute to the biodiversity of the sea by supplying nutrients to the sea through rivers flowing through Satochi-Satoyama and rural areas, and helping the seaweed and phytoplankton living in Satoumi grow.

Fishermen have long known that forests near the sea attract fish, and they have worked to preserve the forests near the sea by building shrines to limit access and having the local lord prohibit logging in the “tomeyama (restricted mountain).” Today still, a total area of 60,000 hectares has been designated as fish-attracting protected forests under the Forest Act (Act No. 249 of 1951), and conservation measures such as restrictions on logging are in place. In recent years, furthermore, rocky-shore denudation and other environmental problems in coastal areas have become more apparent. It has become a matter of common knowledge that mountain nutrients are brought to the sea through rivers to nurture marine life and seaweed, and efforts to plant trees in the upper reaches of rivers have become popular among fishermen.

For people living and working in rural areas and Satochi-Satoyama, the function of forests to recharge water sources is also important. Efforts are being made to preserve forests as water sources. In agricultural production activities, too, impacts on biodiversity in Satoumi and elsewhere can be reduced by proper use of pesticides and fertilizers. Furthermore, biodiversity in forests, villages, rivers, and seas can be conserved by building and improving the infrastructure with attention to the life history and migration of organisms in channels and others and focusing on the ecological networks. In this way, forests, rural and Satochi-Satoyama areas, and Satoumi are interconnected with each other, and so are the scenes of action of forestry, agriculture, and fisheries industries. It is necessary to conserve biodiversity throughout the entire ecosystem. To this end, the government will actively promote initiatives to conserve biodiversity that bring the forests, villages, rivers, and seas together, including agricultural production that places greater emphasis on biodiversity in rural areas and Satochi-Satoyama areas,

support for broad-leaved tree planting activities by fishermen and others, the designation and conservation of fish-attracting protected forests, and forest maintenance to preserve fishing grounds.

Expansion of sales channels for ASC-certified oyster farming and collaboration among forests, villages, rivers, and seas

In 2016, the oyster farming section of the Tokura sub-office of the Shizugawa branch of Miyagi Prefecture Fisheries Cooperative Association became the first in Japan to obtain the Aquaculture Stewardship Council (ASC) aquaculture certification, an international certification that only environmentally and community-conscious aquaculture can obtain.

In the same town, the Minamisanriku Forest Stewardship Council has obtained an FSC certification, and the seaweed and seaweed beds in Shizugawa Bay have been registered under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat. There, the public and private sectors are working together to create a sustainable production system linking the forests, villages, rivers, and seas.

(4) Promotion of ecosystem-based disaster risk reduction [Target 11]

Large-scale natural disasters such as earthquakes and heavy rains associated with extreme weather events have become more frequent and severe in many parts of Japan. The promotion of disaster prevention and mitigation in agriculture, forestry, and fisheries and rural areas, as well as measures to strengthen national resilience, has become an issue in order to prepare for disasters that are likely to occur in the future.

Ecosystem services that rural areas provide, such as air and water regulation and soil erosion control, serve to reduce the risks of storms, floods, and other natural disasters, and play an important role in homeland conservation and disaster prevention and mitigation. In addition, the Millennium Ecosystem Assessment states that, in addition to providing food and water for living, rural areas also provide natural landscapes and places for recreation.

Protecting agriculture, forestry, and fisheries, and rural areas from disasters and making them sustainable is essential to creating a future in which people can feel safe, secure, and prosperous. Therefore, the government will promote the resilience of agriculture and rural areas through measures to improve fisheries community sewerage systems and irrigation ponds in response to frequent and intensifying severe disasters, as well as River Basin Disaster Resilience and sustainability by All measures such as “paddy field dam”.

In view that mountain disasters tend to become more severe and frequent due to the increasing frequency of heavy rain in short period, the government will promote the establishment of forest conservation facilities in protected forests and other areas that need to fulfill their public-interest functions, the revitalization of forests with reduced functions, and the development of coastal disaster prevention forests.

Enhancement of flood prevention functions through “paddy field dam”

In recent years, there is a growing interest in the flood prevention function of rice paddies to prevent and mitigate flood damages by temporarily holding rainwater. Coined "paddy field dam", it is a practice of reinforcing the rainwater holding function of a rice paddy by installing a regulating plate at the drain outlet to control the outflow of water to prevent sudden rise of water levels in rivers and channels. The risk of inundation damage to farmland, settlements, and urban areas is expected to be reduced through the "paddy field dam" practice.

4. Promotion of conservation and sustainable use of genetic resources

Since the beginning of agriculture, Japan has introduced and developed a variety of cultivated plants suitable for diverse environments to secure food supplies. Even today, people's lives depend on diverse biological resources used as food, pharmaceuticals, fuel, and other resources. However, globally, diverse genetic resources are at risk of decrease and loss due to environmental degradation caused by climate change and development practices, rapid decrease of tropical rainforests, and progressing desertification.

On the other hand, among genetic resources, landraces and crop wild relatives in the tropics with excellent resistance to high temperatures and pests are, in particular, essential for overcoming the deteriorated environment and new pests associated with climate change and for developing new varieties that contribute to the stabilization of food production, and coupled with recent advances in scientific technology including biotechnology, they are expected to contribute to the resolution of food, environment, and energy issues. In addition, as landraces and edible wild plants in Japan possess distinctive eating qualities or functionality, and are also the medium through which the indigenous food culture of Japan has been passed down, their conservation and promotion of their use will also lead to the revitalization of rural areas.

Collecting and preserving such valuable genetic resources, passing them on to the next generation, using them sustainably, and sharing them fairly and equitably are internationally important, and they are included in Target 2.5 of the SDGs.

In 2017 Japan concluded the Nagoya Protocol on access to genetic resources and benefit sharing, which was adopted at CBD-COP 10, and it is necessary to continue to develop sustainable agriculture, forestry, and fisheries by collecting and using genetic resources in accordance with the protocol. At CBD-COP 15 in 2022, improved access to genetic resources and equitable benefit sharing for their utilization were listed as one of the goals in the Kunming-Montreal Global Biodiversity Framework, and the sharing of benefits arising from the use of digital sequence information (DSI) of genetic resources was also decided. It is important that Japan continues to be actively involved in discussions for international rulemaking, including the consideration of a multilateral benefit-sharing mechanism which is expected to be discussed further, and to contribute to the formation of international consensus in cooperation with relevant ministries and agencies.

Furthermore, as an international initiative on plant genetic resources, Japan concluded the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR) in 2013, which has a multilateral system for the smooth acquisition and utilization of plant genetic resources under the rules common to all countries, and will continue to participate in negotiations on the treaty in order to facilitate the acquisition of plant genetic resources through the strengthened multilateral system.

(1) Promotion of conservation and sustainable use of genetic resources useful for agriculture, forestry, and fisheries [Targets 4, 5, 9, 13]

Since the properties that genetic resources possess, namely resistance to high temperatures and long rains, pest and oligotrophy tolerance that allow low input of chemical pesticides and chemical fertilizers, super high-yield ability that reduces production costs, and a high energy conversion property, are expected to produce new varieties that contribute to solving food, environmental, and energy problems, it is essential to collect and sustainably conserve diverse genetic resources as well as advance research and study for their use by imparting property information and genomic information.

Therefore, the government will collect and sustainably conserve genetic resources, such as landraces and crop wild relatives, which are to be provided for research and development, including the breeding of new varieties; strengthen characterization; improve preservation efficiency by cryopreservation technology at ultra-low temperatures; strengthen research support through the distribution of research materials, as well as clarify the gene functions in the genome research of genetic resources; develop technology for their use, breed new breakthrough varieties; and create new industries. In particular, in order to maintain the sustainable production of wagyu cattle, which is a genetic resource indigenous to Japan, the government will promote livestock improvement that takes genetic diversity into account. At the same time, in order to utilize local resources such as locally raised chickens stably, the government will promote the use of technologies such as the preservation technology of poultry genetic resources using primordial germ cells (PGCs), the source cells of eggs and sperm.

In addition, amid the growing requests related to forests, such as for countermeasures against hay fever and scenery preservation, policies are to be implemented to promote the collection and conservation of

forestry wood genetic resources and the development of new varieties of woods in order to secure good seeds and seedlings needed for the proper development and conservation of forests in Japan towards the future.

Furthermore, regarding genetic resources useful for agriculture, forestry, and fisheries, their use for the purpose of research and technological development combined with strengthened industry-academia-government collaboration will be promoted.

In the meantime, the aspect that the diversity of genetic resources forms unique local features including food culture shall not be forgotten. Washoku, traditional Japanese food culture, registered as a UNESCO Intangible Cultural Heritage, is a diverse food culture that strongly reflects the characteristics of each region including local cuisine, and uses a variety of locally based food materials, such as seafood, agricultural products, and wild vegetables.

In this way, diverse genetic resources are not only used as ingredients and production materials, but also play a role in the formation of local food cultures. Therefore, it is important to engage in the protection and passing on of food cultures such as local dishes unique to each region to lead to the revitalization of rural areas.

Conservation of plant genetic resources and local revitalization using traditional foods "Akajaga (red potatoes)" and "Awabatadaizu (Awabata soybeans)"

The Plant Biology Research Club at Gunma Prefectural Seta Norin High School is working to conserve genetic resources and promote local revitalization through the revival of the cultivation of Akajaga (red potatoes) and Awabatadaizu (Awabata soybeans), traditional food materials of Kanna Town, Gunma Prefecture and their utilization.

Awabatadaizu, discovered in a survey in 2011, was cultivated by only a small number of farmers at that time, but as a result of holding cultivation workshops, receiving consultation on cultivation techniques, and distributing good seeds, the area under cultivation and the yield of Awabatadaizu has increased dramatically. Okutano Miso, made from Awabatadaizu, has been developed and sold in collaboration with a miso shop in Kanna Town, and local food tasting events and delivery classes have been held at elementary schools, among other local revitalization activities. The club was awarded the Minister of Agriculture, Forestry and Fisheries Award at the 2019 Biodiversity Action Awards.

(2) Ensuring biodiversity in Japan through regulation of genetically modified crops [Target 17]

The four main genetically modified crops cultivated in the world are soybean, maize, cotton, and oilseed rape, and the area under their cultivation is on the rise. Japan imports and uses genetically modified crops produced abroad, such as maize for feed, soybean for oil, and oilseed rape.

New crop varieties that contribute to solving various problems will continue to be developed through the use of recombinant DNA technology. On the other hand, however, there is a possibility that genetically modified crops, etc. may affect the biodiversity of Japan through hybridization with wild plants, and it is necessary to ensure biodiversity in Japan through the regulation of genetically modified crops, etc.

For this reason, in 2004 Japan put into effect the Act on the Conservation and Sustainable Use of Biological Diversity through Regulations on the Use of Living Modified Organisms (Act No. 97 of 2003, hereinafter referred to as "Cartagena Act"), in accordance with the Cartagena Protocol on Biosafety, an international framework for the regulation of living modified organisms. Under the Cartagena Act, Japan has introduced a mechanism to require scientific assessment of the effects of each species of genetically modified crops on biodiversity, depending on the stage of development, and only crops that are confirmed to have no effects on biodiversity of Japan, even when carried under unsealed conditions or grown in natural environment, are allowed to be cultivated or distributed. Specifically, the effects of genetically modified crops on biodiversity will be evaluated based on scientific knowledge, mainly from the perspectives of (i) whether they turn into weeds to affect other wild plants (competitive advantage), (ii)

whether they produce substances harmful to wild animals and plants (productivity of harmful substances and (iii) whether they can hybridize with native wild plants and spread their genes (crossability).

In addition, in accordance with the Cartagena Act, border inspections are to be implemented for seeds for cultivation so as to prevent distribution in Japan of any plant for which the potential effect on biodiversity of Japan is unidentified. In the unlikely event that a plant with an unidentified effect on biodiversity of Japan is found to be distributed in Japan, measures, such as giving orders to recall and prohibit use of such plant, shall be taken steadily.

Furthermore, accumulation of new scientific knowledge required for the assessment of effects on biodiversity, development of testing technologies for genetically modified crops, and information provision to the public shall be conducted.

At the Meeting of the Parties to the Cartagena Protocol on Biosafety in 2010, the Nagoya-Kuala Lumpur Supplementary Protocol relating to liability and redress in the event of damage to conservation or sustainable use of biodiversity caused by the transboundary movement of living modified organisms was adopted. Japan, too, amended the Cartagena Act in 2017 and concluded the Supplementary Protocol. It is important for Japan to continue to appropriately regulate living modified organisms based on the Act.

In addition, prior to the production and distribution of genome editing crops, which do not fall under the category of living modified organisms, the Ministry of Agriculture, Forestry and Fisheries has established a procedure to accept information from developers and publish it on MAFF website, after confirming that the crops have no problems, while consulting experts on the effects on biodiversity.

5. Evaluation and utilization of Initiatives to conserve biodiversity in the agriculture, forestry, and fisheries sector

There are three broad definitions of biodiversity: ecosystem diversity, species diversity, and genetic diversity.

To date, the population size of some species, called indicator species, has been mainly used as data for evaluating the diversity of species in the evaluation of biodiversity conservation efforts in measures related to agriculture, forestry, and fisheries. This is because the government has positioned the recovery of the population of species reduced by the environmental burden resulting from agriculture as an effect of its efforts.

Biodiversity conservation is an economically valuable initiative for agriculture, in which the quality and quantity of ecosystem services that organisms create are restored through the recovery of the number of species and populations of organisms. However, excessive attention on the recovery of populations of endangered species alone without a broad understanding of the above has made it more difficult to communicate the significance of biodiversity and its conservation efforts to farmers.

Therefore, it is necessary to promote measures for biodiversity and its conservation while gaining the understanding of the people on site by communicating not only the effects on biodiversity but also the benefits it will bring to agriculture, forestry, and fisheries and rural communities. It is also necessary to communicate that the agriculture, forestry, and fisheries industry and rural areas not only supply agricultural, forestry, and fisheries products, but also produce ecosystem services such as water source cultivation functions, food culture, and the provision of beautiful landscapes, in order to foster an understanding of the significance of biodiversity conservation efforts among the general public and to promote behavioral change.

Meanwhile, as ESG finance continues to expand rapidly, financial institutions, including institutional investors, are required to appropriately evaluate companies that sustainably conduct environmentally friendly management, including biodiversity efforts, and to expand their investments and loans to such companies.

To this end, basic data will be developed while utilizing the results of past research, such as the properties and survey methods of biota characteristic of ecosystems formed by agriculture, forestry, and fisheries, and the development of evaluation methods for biodiversity in agricultural, forestry, and fisheries spaces and ecosystem services generated by biodiversity utilizing the basic data will be promoted in collaboration with research institutes. In addition, in order to effectively promote related policies, the government will develop science-based assessment methods to understand the positive and negative impacts of efforts based on these policies on biodiversity, and will consider using these assessment methods to visualize the effects of biodiversity conservation efforts on biodiversity and ecosystem services, as well as promote

the deepening of national and international understanding of biodiversity-friendly agriculture, forestry, and fisheries products. Furthermore, in order to support the smooth transition of companies regarding ESG value assessments and information disclosure standards, the government will provide information and take other measures in collaboration with relevant ministries and agencies, with a view to expanding investment and financing in environmentally friendly activities, including biodiversity friendly activities, food, agriculture, forestry, and fisheries, and related technological development.

(1) Survey and research on biodiversity in agriculture, forestry, and fisheries spaces [Target 21]

(Promotion of initiatives related to biodiversity in agroecosystems)

As for assessment methods of biodiversity related to agricultural methods, in order to understand the effect of agricultural methods contributing to biodiversity conservation, such as the difference between environmentally friendly agriculture and conventional agriculture, research was conducted in 6 regions across Japan. As a result, a new evaluation method was developed using birds in paddy fields and their prey and plants for assessment, and an explanatory manual was published in March 2018. In addition, in order to promote the assessment and conservation of the organism conservation function of agricultural water channels, a program was developed to assess the habitability of fish in channels from data of fish living in channels and environmental data, and a manual and an evaluation program were published in March 2018. In the future, the government will use these manuals to collaborate and cooperate with prefectures and volunteering farmers to put the assessment method into practice at production sites.

In order to further promote effective agricultural methods for the conservation of biodiversity in the future, it is necessary to identify and properly evaluate ecosystem services derived from biodiversity. For this reason, the government will continue to promote research to maximize the functions of indigenous natural enemies and pollinator insects, which are representative beneficial insects, and promote the development of highly economical cultivation management systems that actively utilize them. In addition, the government will analyze the growth information of soil microflora and crop (soybean) and the interaction with environmental factors in order to elucidate and demonstrate soil microbial functions.

(Promotion of initiatives related to biodiversity in forest ecosystems)

In recent years, due to the growing awareness of environmental issues on a global scale, the promotion of sustainable forest management has been recognized as an important issue, and efforts have been started in countries around the world to monitor, evaluate, and report on the status of their forests using the standards and indicators of sustainable forest management agreed upon in the international process. In order to promote sustainable forest management in Japan as well, it is necessary to continuously monitor, assess, and report on the status of forests, including biodiversity, and trends in their changes, and to reflect these findings in the formulation of regional forest plans.

Therefore, it is necessary to fully grasp data on non-commercial tree species and biodiversity in the forest resources survey conducted in Japan, and the government will promote monitoring of forest resources, in which data related to internationally agreed standards and indicators, such as wood production, biodiversity, prevention of global warming, and conservation of water resources in watersheds, are collected and analyzed by a unified method. The results of the survey will continue to be made available to the general public for further use in academic research. The government will also promote research that contributes to promoting public understanding of forest ecosystem management and biodiversity conservation for sustainable forest use.

(Promotion of initiatives related to biodiversity in marine ecosystems)

With regard to the oceans, the government will continue research and study on the resource trends of major target fish species caught in coastal areas and the high seas, as well as their factors of variation, and will continue to accumulate relevant data.

In addition, seaweed beds and tidal flats in coastal areas, which have significantly decreased in area, greatly contribute to fisheries and ecosystem services by decomposing organic matter supplied from the land area and providing spawning and breeding grounds for marine organisms, and also affect the increase and decrease of aquatic resources. In order to sustain sustainable fishery production while maintaining a good fishing ground environment and biodiversity, it is critical to maintain the diversity and function of decomposers, which play an important role in the ecosystems of seaweed beds and tidal flats.

(2) Visualization of initiatives to conserve biodiversity in the agriculture, forestry, and fisheries sector [Targets 15, 16]

(Visualization of initiatives to conserve biodiversity in products)

In order to promote decarbonization and biodiversity conservation efforts at production sites to reduce environmental impact, it is essential to foster understanding of the products at the distribution and consumption stages and to evaluate them appropriately. The MIDORI Strategy also calls for the promotion of visualization of business operators' efforts, including labeling methods, to promote consumer understanding and behavioral change.

In some regions, there have been examples of communication among producers, distributors, and consumers through products by displaying biodiversity conservation efforts on products. With reference to these efforts, the Ministry of Agriculture, Forestry and Fisheries will consider a method for displaying on products efforts to conserve biodiversity.

(Promotion of visualization linking supply chains)

In recent years, there have been an increasing number of cases in which companies procure certified products to demonstrate to investors their efforts of environmental consideration in their business activities, including the use of natural capital. For crops such as palm oil and cacao that are grown in plantations in tropical regions, there is a certification, for which one of the criteria is that they are grown without agricultural land development through illegal logging, and procuring these certified products is considered to contribute to the conservation of biodiversity on a global scale.

On the other hand, for domestically produced agriculture, forestry, and fisheries products, although there have been examples of the use of certified products for which one of the requirements is the contribution to biodiversity conservation, the rate of obtaining certification is extremely low. The reasons for this include a large labor force required to refrain from using chemical pesticides such as insecticides/fungicides and herbicides in the Asian monsoon region with a relatively vigorous emergence of pests and weeds, to which Japan belongs, the complicated procedures and expenses required to obtain certification, and the difficulty of selling certified products with additional costs. In addition, in order for companies to procure a certain amount of certified products on an ongoing basis, it is more likely that they will have to choose imported products, because they will not be able to secure sufficient quantities from domestically produced certified products alone. Moreover, in view that the agriculture, forestry, and fisheries industry and rural areas are themselves the basis of ecosystem services, and that some producers have not obtained certification but are practicing equivalent production methods, it is hard to say that their failure to obtain certification means that they are not contributing to biodiversity. From the above, simply promoting the procurement of certified products without considering certification criteria may not lead to the promotion of biodiversity conservation efforts in Japan.

In order to protect Japan's agriculture, forestry, and fisheries, as well as the unique lives and cultures that result from them, it is necessary to examine visualization methods that take into account the actual conditions of Japan's natural environment and the agriculture, forestry, and fisheries industry, and to encourage distributors, consumers, and others to choose sustainable domestic agriculture, forestry, and fisheries products. In addition, in order to increase the value of domestic agricultural products through wider use of visualization methods, it is necessary to consider not only certification but also less costly and more reliable methods using new technologies, such as IoT and blockchain.

To this end, the government will survey and analyze the status of visualization methods for biodiversity conservation efforts used in Japan and abroad, and provide information that will serve as a reference for producers and companies that intend to start initiatives.

(3) Consideration of providing biodiversity data that finance and business can use [Target 15]

The Economics of Ecosystems and Biodiversity (TEEB), proposed by the European Commission and Germany in 2007, positions the benefits derived from natural capital (stock) as ecosystem services (flow), and advocates the idea that the economic value of ecosystem services must be considered in all decision making by the general public, businesses, and government; in other words, "the internalization of the value of nature" is necessary.

In response to this, the Ministry of Agriculture, Forestry and Fisheries has published the "Guide to Agriculture, Forestry and Fisheries Utilizing Natural Capital: Towards Economic Partnerships for

Biodiversity Conservation," a manual which describes the significance and value of activities that contribute to the conservation of biodiversity in rural areas from an economic perspective, and summarizes the methods for establishing economic partnerships between agriculture, forestry, and fisheries workers and companies. In addition, a summary pamphlet has been prepared for both agriculture, forestry, and fisheries workers and companies in an effort to foster understanding.

While the MDGs (Millennium Development Goals) put the development of developing countries at the center of the agenda and developed countries are in a position to assist them, the SDGs adopted by the United Nations General Assembly in 2015 became goals encompassing all aspects of economy, society, and environment. The SDGs are a common challenge for developed countries, and as responsible action has come to be required to achieve them, ESG-related information has started to be disclosed in annual reports, especially by global companies, to show their contribution to the SDGs. Against the backdrop of the Principles for Responsible Investment (PRI), financial institutions have come to emphasize ESG evaluation in their investment and loan decisions, and the amount of ESG investment and loan in the world continues to increase year by year.

In the Dasgupta Review published in February 2021, it was pointed out that human demand has already greatly exceeded nature's supply capacity, and that in order to establish a sustainable relationship with nature, it is necessary to change the way economic success is measured and to transform institutions and systems so that economic activities can be conducted with a balance between supply and demand.

In light of these circumstances, sustainability disclosure, including ESG, is undergoing significant changes. In November 2022 the European Commission gave final approval to the Corporate Sustainability Reporting Directive (CSRD), an amendment to the Non-Financial Reporting Directive (NFRD, enacted in 2018). Under the directive, the scope of companies covered has been significantly expanded, and it is expected that disclosure requirements will be applied in a phased manner from FY 2024 at the earliest, not only to large companies but also to small and medium-sized companies meeting certain requirements, and companies outside the EU. Meanwhile, the International Financial Reporting Standards (IFRS) Foundation established the International Sustainability Standards Board (ISSB) in November 2021 to develop international standards for sustainability reporting, and the move toward unification of information disclosure standards is accelerating.

In recent years, companies have been required to disclose their climate-change risks and opportunities to investors and others, and large companies are increasingly analyzing their climate-change risks and opportunities and disclosing them in their environmental and financial reports, in support of the final report (TCFD recommendations) released in June 2017 by the Task Force on Climate-related Financial Disclosures (TCFD) established by the Financial Stability Board (FSB).

In addition, the Taskforce on Nature-related Financial Disclosures (TNFD) was officially launched in June 2021, and a declaration to welcome the TNFD was made at the G7 finance ministers' meeting the same year. With the aim of changing global financial flows toward “nature positive” by companies disclosing natural capital-related information in accordance with a standardized framework, the final version of the disclosure framework is scheduled to be released in September 2023. TNFD has stated that it will seek to integrate its framework with existing evaluation methods, such as TCFD recommendations and IFRS standards.

Meanwhile, capturing the momentum of the SBT Initiative (SBTi), which promotes the setting and implementation of science-based targets for climate change (SBTs), the SBT Network (SBTN) was established in 2019 to respond to corporate demand for global system-wide target setting. In September 2020, the SBTN released a draft of the initial guidance for companies on the establishment of the “SBTs for Nature,” and is in the process of releasing its target-setting methodology to companies by early 2023.

In addition, as the Kunming-Montreal Global Biodiversity Framework in December 2022 set a target for businesses, especially large corporations, multinational corporations and financial institutions, to take steps to disclose their biodiversity risks, and their dependence and impact on biodiversity, the movement toward disclosure is expected to accelerate in Japan and abroad.

In light of this situation, it is necessary to work with relevant ministries and agencies to encourage companies involved in the food, agriculture, forestry, and fisheries industries to obtain timely information on international trends concerning ESG assessment methods and information disclosure requirements for companies, and to consider providing biodiversity data that can be used for corporate assessment, in order to facilitate a smooth transition.

In addition, the government will work to promote related measures in a way that companies involved in the food, agriculture, forestry, and fisheries industries can improve their ESG scores by internalizing the value of nature in their decision making, and investments and loans to companies engaged in promoting production activities that contribute to biodiversity conservation will increase.

Taskforce on Nature-related Financial Disclosures (TNFD)

TNFD was launched in June 2021, with the mission of developing and delivering a risk management and disclosure framework for organizations to report and act on nature-related risks so that global financial flows will shift toward nature-positive outcomes. The framework is to be tested and reviewed in 2022, and the final version of the information disclosure framework will be released in September 2023 to promote its use.

2020 – 2021	**Phase 0: Preparation**	Informal Working Group (IWG) formed in July 2020; TNFD launched in June 2021
2021 – 2022	**Phase 1: Construction**	Task force members announced; TNFD framework creation started
2022	**Phase 2: Testing**	Framework testing and reviewing in emerging and developed markets
2023	**Phase 3: Discussion**	Broad discussion with financial regulators, data producers, and data users in 20 emerging and developed markets
Second half of 2023	**Phase 4: Publication**	Framework announced through major events and independent public relations activities
From September 2023	**Phase 5: Dissemination**	Ongoing guidance to support the implementation of the framework

V. Strengthen the Implementation System

In order to encourage the implementation of the MAFF Strategy across the entire supply chain to achieve both environmental protection and economic development, it is necessary to strengthen the implementation system to ensure steady execution of initiatives on site.

To this end, in effectively promoting the MAFF Strategy, the government will clarify the roles required of each entity, and encourage various entities such as relevant ministries and agencies, private companies, local governments, research institutes, and financial institutions to act independently in cooperation with each other.

(Citizens)

Citizens are first required to develop an appropriate understanding of the current state of biodiversity in Japan and abroad, and the relation of the agriculture, forestry, and fisheries industry and rural areas to biodiversity. Next, by becoming aware of the relationship between products and services the citizens use in their daily lives and biodiversity, and by selecting more sustainable products and services, citizens are expected to contribute to the realization of a “society in which the environment and economy circulate and improve together, while taking advantage of the natural blessings nurtured by rural areas" that the MAFF Strategy aims to achieve.

(Educational institutions)

Educational institutions are required to provide education on the relationship between biodiversity and ecosystem services, and daily life, as well as on the background of biodiversity loss. It is also necessary to develop human resources and secure tools to educate people on biodiversity. In addition, it is desirable to foster understanding consumers by increasing the opportunities to visit production sites. It is hoped that these efforts will contribute to deepening the proper understanding by citizens and encouraging their behavior change.

(Media)

It is desirable for media to widely disseminate the importance of biodiversity conservation efforts, based on scientific findings. It is hoped that this will contribute to deepening the proper understanding by the citizens and encouraging their behavior change.

(NPOs and NGOs)

NPOs and NGOs are required to play a role in supporting more effective and efficient efforts to conserve biodiversity by taking action, providing support, and promoting information sharing in collaboration with diverse entities. In addition, as the participation of the general public in these activities makes them more aware of the blessings of nature nurtured in rural area, NPOs and NGOs are expected to play a major role in the dissemination and enlightenment of knowledge on biodiversity as well.

(Agriculture, forestry, and fisheries workers)

Agriculture, forestry, and fisheries workers maintain the biodiversity of rural areas and the ecosystem services it generates through their production activities, and they play the most important role in the conservation of regional biodiversity. On the other hand, it is also necessary to promote reduction of the environmental load of agriculture, forestry, and fisheries’ production activities. Therefore, agriculture, forestry, and fisheries workers are expected to comply with the law, respect the various plans of the national and local governments, understand the impact of production activities on biodiversity, and work with private companies, cooperatives, and research institutes to utilize technologies that have lower environmental impact and can maintain productivity.

(Private companies and cooperatives)

In addition to evaluating and analyzing the financial impact of risks and opportunities associated with natural capital, incorporating the reduction of environmental load of the entire supply chain into management policies, and disclosing information related to initiatives, private companies are expected to engage in repeated dialogue with financial institutions to convey their values and initiatives. Cooperatives are also required to contribute to the reduction of environmental load at production sites through the sale of production materials and the procurement and distribution of products. These measures are expected

to expand ESG investments and loans with the recognition of financial institutions, and to promote greater sustainability of the entire food systems, including agriculture, forestry and fisheries.

(Financial Institutions)

Financial institutions, including institutional investors, are required to evaluate companies that sustainably conduct environmentally friendly, including biodiversity friendly, management and to increase investment in such companies. Regional financial institutions such as regional banks and shinkin banks are expected to actively contribute to the virtuous cycle of the environment and the economy in rural areas, not only as the main banks for local small and medium-sized enterprises, but also by viewing the environmental sector, including biodiversity, as a growth industry in the agriculture, forestry, and fisheries sector and expanding loans for environmentally friendly businesses.

(Research Institutes)

Since research institutes have the latest knowledge on biodiversity, they are required to provide technical advice and guidance on the related measures of the MAFF Strategy from a long-term perspective, as well as promote the development of evidence data and evaluation methods to show the relationship between biodiversity and ecosystem services, and their conservation efforts. It is also expected that, in collaboration with the national government and financial institutions, research institutes will examine less costly and more reliable methods for making efforts visible, thereby contributing to efforts at production sites and promoting behavior change in companies and consumers.

(Local governments)

Local governments are responsible for the conservation of biodiversity and the promotion of agriculture, forestry, and fisheries in their areas by having thorough knowledge of local conditions. Therefore, they are expected to cooperate closely with the relevant agencies and departments to conserve regional biodiversity and use it sustainably so that comprehensive measures corresponding to various related plans such as the MAFF Strategy and the MIDORI Strategy can be implemented. In addition, since there is a limit to the problems that can be solved by one local government alone, it is desirable that related local governments share their roles and work closely together.

(National government)

In order to enhance the effectiveness of the MAFF Strategy, the Ministry of Agriculture, Forestry and Fisheries will encourage the relevant departments and agencies and local organizations, such as Regional Agricultural Administration Offices and National Forest Regional Offices, to share their roles and work together on relevant measures. In addition, the MAFF will support agriculture, forestry, and fisheries workers and private companies in disseminating their biodiversity conservation efforts to investors and consumers in Japan and abroad, and promoting biodiversity conservation efforts being undertaken at production sites. In disseminating information, emphasis is placed on the perspective of the receiving party, and efforts are made to communicate information in an easy-to-understand manner with a content and means appropriate for each target in cooperation with various entities.

Local organizations such as Regional Agricultural Administration Offices and National Forest Regional Offices will actively promote measures related to the MAFF Strategy in collaboration with local organizations of relevant ministries and agencies and local governments, and will also make efforts to publicize and disseminate biodiversity conservation activities undertaken by various entities so that they become familiar to local residents.

Relevant ministries and agencies will work together to encourage local organizations of the government to promote not only the measures of their ministries and agencies, but also initiatives that contribute to the achievement of the SDGs and the Kunming-Montreal Global Biodiversity Framework, to enhance the effectiveness of the MAFF Strategy.