

JICA Biodiversity Finance Impact Tool (Biodiversity-FIT)
Guidance on Biodiversity Mainstreaming

Part II
Sector-Specific Guidance for Biodiversity
Mainstreaming

Tourism Sector

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1. Importance of Biodiversity in the Tourism Sector

1.1 Relationship between Ecosystem Services and Tourism

The tourism sector is highly dependent on a wide range of ecosystem services provided by the natural environment. Natural assets such as scenic landscapes, clean water, rich biodiversity, a pleasant climate, and cultural and spiritual values form the foundation for enhancing visitors' experiences and the attractiveness of destinations. For example, natural resources including national parks, World Heritage sites, hot spring areas, and coastal, lake, and mountainous environments directly provide tourism and recreational services. In addition, local traditions, festivals, and food cultures—shaped through interactions between ecosystems and human societies—constitute cultural ecosystem services that support the diversity and sustainability of tourism.

At the same time, the tourism sector faces various challenges and risks arising from ecosystem change and degradation. Excessive tourism development and infrastructure construction, environmental pressures caused by high concentrations of visitors, increased waste generation and wastewater discharge, the introduction of invasive species, and changes in land use can all undermine the capacity of ecosystems to deliver services. Reported impacts include depletion and deterioration of water resources in tourist destinations, degradation of landscapes and habitats, and the loss of cultural values, all of which affect the sustainability of tourism itself and the resilience of local communities. Furthermore, climate change and the increasing frequency of natural disasters are heightening the vulnerability of tourism resources.

Against this backdrop, nature-positive approaches to tourism—aimed at maximizing the benefits of ecosystem services while promoting the conservation and restoration of natural capital and coexistence with local communities—are gaining increasing attention. Examples include the promotion of ecotourism and responsible tourism, experiential tourism that leverages local natural and cultural resources, the conservation and sustainable use of natural and cultural heritage, the introduction of renewable energy and green infrastructure, improved waste reduction and water resource management, and environmental education and capacity building for local residents and tourism stakeholders. These initiatives not only enhance the quality and value of tourism, but also contribute to the maintenance and enhancement of ecosystem services, the strengthening of local resilience, and the achievement of the Sustainable Development Goals (SDGs), and are increasingly recognized as strategic investments in the tourism sector.

1.2 Linkages with Local Communities and Culture

Biodiversity in the tourism sector is not limited to natural assets or scenic resources, but is deeply intertwined with local culture, traditions, and social structures. In many tourist destinations, natural landscapes and ecosystems are closely integrated with local festivals, traditional events, food

cultures, crafts, and spiritual practices, providing visitors with unique and place-specific experiences. For example, satoyama¹, terraced rice fields, coastal areas, hot spring regions, and World Heritage sites are valued as cultural landscapes that reflect the historical coexistence of nature and human society, thereby enhancing their significance as tourism resources. International frameworks such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Taskforce on Nature-related Financial Disclosures (TNFD) also emphasize the importance of “cultural ecosystem services” and “spiritual values” in the tourism sector, leading to a renewed recognition of tourism’s role in sustaining regional identity and cultural heritage.

In addition, traditional knowledge and customary practices developed by local communities through long-standing coexistence with the natural environment are increasingly recognized as valuable wisdom for sustainable tourism resource management. In Japan’s tourism policies and JICA’s support for the tourism sector, strong emphasis is placed on community-led tourism development, the conservation and sustainable use of cultural and natural heritage, and the promotion of community-based tourism (CBT). For instance, conservation activities for natural and cultural heritage, experiential programs related to traditional festivals and local food culture, and ecotourism initiatives led by local guides promote interaction between visitors and local communities, while contributing to regional economic revitalization and social inclusion. Furthermore, tourism can serve as a platform for environmental education, intergenerational knowledge transfer, and the active participation of women and youth, thereby generating diverse social values.

In this way, biodiversity conservation in the tourism sector forms a fundamental basis for sustaining cultural values and social cohesion within local communities, and plays a key role in enhancing the sustainability of tourism and the resilience of regions. Integrating perspectives on ecosystem services and cultural values into the planning, implementation, and evaluation of tourism projects is essential for achieving truly sustainable tourism and inclusive regional development.

1.3 Global and Domestic Initiatives toward Nature Positive Approach in the Tourism Sector

In the Kunming–Montreal Global Biodiversity Framework (GBF) adopted in 2022, achieving nature-positive outcomes defined as halting and reversing biodiversity loss by 2030 was set as a global objective. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has recommended promoting behavioral change among tourism operators through sustainable destination management, the enhanced use of ecosystem services, and the disclosure

¹ Satoyama refers to mountains and forests surrounding rural settlements and farmlands, characterized as secondary natural environments that have been formed and maintained through long-term human use and management. (Ministry of Environment Japan (2022) “Satoyama in Japan -For Nature-based Solutions-”)

of nature-related risks². The United Nations World Tourism Organization (UNWTO) is also promoting “Nature Positive Tourism,” strengthening international frameworks that position tourism as a contributor to biodiversity conservation and the well-being of local communities³. In addition, international organizations such as UNEP, IUCN, and the World Bank are advancing policy integration and practical approaches based on Nature-based Solutions (NbS), including the restoration of wetlands and coastal areas, the introduction of green infrastructure, and the promotion of nature-based tourism experiences⁴. Furthermore, the Taskforce on Nature-related Financial Disclosures (TNFD) is encouraging transformations in decision-making and financial flows among companies, including tourism operators, through the disclosure of nature-related risks and opportunities, thereby supporting the realization of nature-positive management in the tourism sector⁵.

In response to these initiatives, multilateral development banks (MDBs) revised the Common Principles for Tracking Nature Finance in November 2025 and introduced a new “Common Nature Finance Taxonomy⁶”. This taxonomy classifies investments and projects that contribute to nature-positive outcomes into four categories: (a) restoration and conservation of biodiversity or ecosystem services; (b) reduction of the direct drivers of biodiversity or ecosystem services loss; (c) integration of nature-based solutions across economic sectors; and; and (d) design and implementation of policy, tools or other sectoral instruments enabling (a) to (c). The taxonomy standardizes eligible activities across seven sectors⁷, including the Industry, trade, and services sector (such as tourism, manufacturing, trade and retail), and is positioned as a framework to enhance the consistency and transparency of nature finance. Furthermore, the International Capital Market Association (ICMA) published “Sustainable Bonds for Nature: A Practitioner’s Guide⁸” in June 2025, providing practical guidance for the issuance of sustainable bonds targeting projects that contribute to biodiversity and natural capital. These initiatives reflect the expanding scale of nature-related investment in international capital markets, including investments in urban and regional development.

² IPBES (2019). “Global Assessment Report on Biodiversity and Ecosystem Services”. <https://ipbes.net/global-assessment>

³ UNWTO (2024). “Nature Positive Travel & Tourism In Action”. <https://www.e-unwto.org/doi/epdf/10.18111/9789284425020>

⁴ IUCN (2020). “Guidance for using the IUCN Global Standard for Nature-based Solutions”. <https://iucn.org/resources/publication/iucn-global-standard-nature-based-solutions-first-edition>

⁵ TNFD (2023). “Recommendations of the Taskforce on Nature-related Financial Disclosures”. <https://tnfd.global/publications/recommendations/>

⁶ World Bank (2025). MDB Common Nature Finance Taxonomy <https://www.worldbank.org/en/topic/environment/publication/mdb-common-nature-finance-taxonomy>

⁷ 1. Forestry, agriculture, fisheries, and aquaculture, 2. Mining and energy, 3. Transportation, 4. Waste management, water, and sanitation, 5. Industry, trade, and services, 6. Financial sector, and 7. Cross-cutting themes (Renewable Natural Resources Asset Management, Urban Development and Disaster Risk Management, Green Buildings)

⁸ International Capital Market Association (2025). “Sustainable Bond for Nature: A Practitioner’s Guide”. <https://www.icmagroup.org/assets/documents/Sustainable-finance/2025-updates/Sustainable-Bonds-for-Nature-A-Practitioners-Guide-June-2025.pdf>

Domestically, Japan's "National Biodiversity Strategy and Action Plan (NBSAP) of Japan 2023-2030, the sixth edition (2023)" and the "Annual Report on the Environment, the Sound Material-Cycle Society and Biodiversity in Japan (2023)," both formulated by the Ministry of the Environment, Japan emphasize the vision of simultaneously achieving net-zero GHG emissions, a circular economy, and a nature-positive. Within this policy framework, priority is placed on the conservation and restoration of tourism destinations, national parks, and World Heritage sites, the promotion of green tourism and ecotourism, the certification of Nationally Certified Sustainably Managed Natural Sites⁹, and the introduction of green infrastructure. In addition, the "The New Tourism National Promotion Basic Plan (2023)" (Ministry of Land, Infrastructure, Transport and Tourism) highlights sustainable tourism, enhanced destination management, and regional revitalization through tourism, while promoting the conservation of natural and cultural resources and strengthened regional collaboration¹⁰.

Based on the JICA Global Agenda with 20 Strategies for Global Development, JICA positions the tourism sector as a cross-cutting priority across multiple areas, including "Private Sector Development" and "Natural Environment Conservation", and contributes to the achievement of the SDGs, particularly Goals 8, 11, 12, 14, and 15. The tourism sector thus represents a key driver in leading the transition toward an economy and society that coexist in harmony with nature.

Furthermore, projects for which biodiversity mainstreaming in development operations has been examined using this guidance and for which contributions to biodiversity are confirmed will be reported to the OECD-DAC under the Rio Marker for Biodiversity¹¹, and will also be communicated externally.

⁹ Nationally Certified Sustainably Managed Natural Sites refer to areas certified by the Ministry of the Environment, Japan where biodiversity conservation is achieved through private-sector initiatives, including company-managed forests, satoyama landscapes, and urban green spaces. These sites form part of Japan's efforts to achieve the 30by30 target—to conserve at least 30 percent of land and sea areas by 2030—and are registered internationally as Other Effective Area-based Conservation Measures (OECMs), which contribute to biodiversity conservation outside formally designated protected areas.

¹⁰ Japan Tourism Agency, Ministry of Land, Infrastructure, Transport and Tourism (2023). "The New Tourism Nation Promotion Basic Plan" <https://www.mlit.go.jp/kankocho/en/kankorikkoku/kihonkeikaku.html>

¹¹ Since 2002, projects that contribute to at least one of the three objectives of the Convention on Biological Diversity (CBD)—namely, (i) the conservation of biological diversity, (ii) the sustainable use of its components (ecosystems, species, or genetic resources), and/or (iii) the fair and equitable sharing of the benefits arising from the utilization of genetic resources—have been reported as the Rio Marker for Biodiversity in the OECD-DAC Creditor Reporting System (CRS) statistics.

The criteria for assigning the Rio Marker "Biodiversity" under the OECD-DAC are set out in the following official guidance documents:

[https://one.oecd.org/document/DCD/DAC/STAT\(2018\)26/FINAL/en/pdf](https://one.oecd.org/document/DCD/DAC/STAT(2018)26/FINAL/en/pdf)

2. Main Challenges and Potentials of Biodiversity in the Tourism Sector

2.1 Impacts of Ecosystem Services on Tourism Projects (Dependencies)

The Millennium Ecosystem Assessment (MA) and the Economics of Ecosystems and Biodiversity (TEEB) classify ecosystem services into four categories: provisioning services, regulating services, habitat (supporting) services, and cultural services. In the tourism sector, ecosystem services, particularly cultural services (such as landscape values, spiritual values, and recreation) and regulating services (such as climate regulation, water cycling, and disaster risk reduction), play a particularly important role.

The loss of ecosystem services—such as the degradation of forests and wetlands, deterioration of landscapes, and destruction of coastal coral reefs—can reduce the attractiveness of tourism destinations and lead to biodiversity loss, posing risks such as declining visitor numbers and stagnation of local economies. In addition, the weakening of climate regulation and disaster mitigation functions can, in the face of increasingly frequent extreme weather events and natural disasters, have serious impacts on tourism infrastructure and local communities. These negative effects ultimately manifest as reduced sustainability of tourism businesses and a decline in the brand value of destinations.

Conversely, when ecosystem services are maintained or enhanced, tourism initiatives that incorporate the conservation and restoration of natural environments can generate significant opportunities, including improved landscape and recreational values, reduced disaster risks, and strengthened resilience to climate change. The promotion of ecotourism and the introduction of green infrastructure contribute to improving the quality of tourism resources and shaping local identity, thereby enhancing destination brand value and profitability.

As described above, tourism activities are highly dependent on ecosystem services. Therefore, in order to achieve sustainable tourism development, it is essential to promote project design and implementation based on a balanced consideration of both the risks and opportunities arising from ecosystem services.

2.2 Impacts of Tourism Projects on Ecosystems (Impacts)

Tourism projects can have negative impacts on ecosystem services, for example through excessive tourism development and infrastructure construction, the modification of forests and wetlands, or land reclamation in coastal areas. Such activities may lead to the degradation of landscape values, loss of biodiversity, deterioration of water quality, and soil erosion, resulting in the decline of cultural ecosystem services and regulating services. In addition, excessive pressure on the natural environment caused by high concentrations of visitors can reduce and fragment habitats for wildlife, exacerbate conflicts within local communities, and ultimately diminish the attractiveness of tourism

destinations.

At the same time, there are cases in which tourism projects contribute to the conservation and restoration of natural capital and lead to nature-positive outcomes. For example, in the management of national parks and World Heritage sites, conservation activities financed through tourism revenues, ecotourism initiatives that incorporate nature-friendly accommodation and tour design, and environmental conservation activities carried out in collaboration with local communities can enhance landscape and recreational values, strengthen regulating services such as habitat restoration, and reinforce cultural ecosystem services. Furthermore, efforts by tourism operators to promote sustainable destination management and environmental education can create opportunities to enhance regional brand value and develop new tourism resources.

In this way, tourism projects have both negative and positive impacts on ecosystem services. It is therefore essential to appropriately assess risks and opportunities at the planning and implementation stages of projects, and to maximize contributions toward a nature-positive society.

3. Mainstreaming Biodiversity in Practice (Tourism Sector)

Biodiversity mainstreaming in development projects refers to the integration and practical application of perspectives on natural capital and biodiversity throughout all stages of a project, including planning, implementation, monitoring, and evaluation. This chapter introduces a practical approach to biodiversity mainstreaming in the tourism sector through the following five steps. An overview of the entire process is provided in Part I, “5. Mainstreaming Biodiversity in Practice (Overview).”

3.1 Step 1: Identification of Interfaces between Project Activities and Natural Capital and Ecosystem Services, and Preliminary Consideration of Response Measures

Project activities in the tourism sector benefit from a wide range of ecosystem services derived from natural capital, while at the same time exerting various impacts on natural capital and ecosystems. These dependencies and impacts are closely linked to the biodiversity of the areas targeted by projects and therefore require appropriate understanding and response.

In this first step, the project identifies how the planned project activities depend on ecosystem services and how they affect natural capital and ecosystems (i.e., the project’s interfaces with ecosystem services). To this end, the department responsible for the project uses the Sector-specific Ecosystem Impact Matrix to examine the degree of dependency on and impact on ecosystem services associated with the project. This matrix is developed with reference to

assessments under ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure)¹² and evaluates the degree of interaction between project activities and ecosystem services, provisioning services, regulating services, habitat (supporting) services, and cultural services, using a five-level scale (see Figure 1). In addition, by referring to the List of Response Measures to Ecosystem Impacts (see Figure 2), an initial examination is conducted of potential response measures that may be considered based on the identified points of interaction.

Touchpoints with Ecosystem Services																																													
			Provisioning Services												Regulating Services										Habitat Services		Cultural Services																		
No	Tourism: Sectors	Tourism: Sub-sectors	Ecosystem Services ⁽¹⁾		Provisioning Services												Regulating Services										Habitat Services		Cultural Services																
			Water	Food, Materials, Medicine, and Aesthetic Resource	Genetic Material	Climate Regulation	Water Flow Regulation	Regional Disaster Mitigation	Erosion Prevention	Soil Quality (soil productivity) Regulation (including soil formation)	Water Purification	Air Purification	Waste Remediation	Attenuation of Noise and Light	Biological Control	Pollination	Provision of Habitat and Nurseries	Maintenance of Genetic Diversity	Creation of Recreational and Tourism Opportunities	Preservation of Natural Landscapes	Scientific Values																								
Activities in each Sector and Sub-sectors			ENCORE Category	Provision of clean water	Extraction of Biodegradable Resources (timber, etc.)	Extraction of Abiotic Resources (minerals, etc.)	Use of Land-based Ecosystems	Specific Genetic Materials Required for Product and Ecosystem Services	Climate Regulation (Moisture and Temperature)	Carbon Sequestration and Storage	GHG Emissions	Stabilization of Water Cycle	Hazardous Pattern Regulation (Prevent)	Storm Mitigation	Flood Mitigation	Soil and Sediment Retention	Soil Quality Regulation (Fertilization, etc.)	Emissions of Toxic Pollutants to Water	Emissions of Acidic Pollutants to Soil	Water Purification	Emissions of Toxic Pollutants to Air	Emissions of Acidic Pollutants to Air	Emissions of Volatile Organic Compounds (VOCs) to Air	Emissions of Greenhouse Gases to Air	Emissions of Solid Waste	Generation and Emission of Liquid Waste	Generation and Emission of Gaseous Waste	Generation and Emission of Noise and Light	Generation and Emission of Other	Sensory Impacts (light, sound, etc.)	Unsustainable Consumption, etc.	Diseases Control	Services from Forests and Other	Pollutants (pests, etc.)	Maintenance of Riparian Ecosystems	Area of Land Use	Area of Freshwater Use	Area of Ocean Use	Introduction of Invasive Species	Fortification and Recreation	Cultural Value	Visual Amenities	Scientific and Educational		
1	Accommodation and Food Services	Camping grounds, recreational vehicle parks and trailer parks		L	L	VL				L	M	L	M	M	H	H		L	ND	M	L	ND	H	L	ND	M	M	M	M	M	L	L			L	L		M	M	ND	H				
		Short-term accommodation activities		L	L					L	VL	L	L	VL	L	VL	L		L	L	L	M	L	L	ND	VL		ND	M	M	M	M	L	VL			L	L		M	M	ND	H		
		Other accommodation		L	L					L	VL	L	L	VL	L	VL	L		L	L	L	M	L	L		ND	VL		ND	ND	M	M	M	L	VL			L	L		M	M	ND	H	
2	Management and Administration Services	Travel agency, tour operator, reservation service and related activities		VL	L					L	VL	L	VL	L	VL	VL	VL		L	L																									

Source: Prepared by JICA based on data provided by ENCORE

Figure 1 Sector-specific Ecosystem Impact Matrix (Illustrative Image)

In the List of Response Measures, the main response measures to the anticipated ecosystem impacts are organized for each activity in the tourism sector shown in Table 1, and are summarized in the areas highlighted by the red boxes in Figure 2.

Table 1 List of Activities Organizing Response Measures to Ecosystem Impacts in the Tourism Sector

NO.	Sub Sector	Activities
1	Development and operation of tourism resources and infrastructures	Construction of tourism facilities
		Operation of tourism facilities (botanical gardens, parks, etc.)
		Development and operation of lodging facilities
		Development and improvements of visitor facilities (museums, tourist centers, etc.)
2	Design of tourism-oriented products	Design of tourism products and services (packaged tours, safaris, cultural tours, etc.)

¹² ENCORE is a natural capital assessment tool jointly developed by UNEP and other partners (<https://encore.naturalcapital.finance>). As ENCORE is based on industry classifications designed primarily for corporate and economic activities, it should be noted that the specific activities of JICA projects may not be fully covered.

NO.	Sub Sector	Activities
	and goods	Development of tourism goods and tourist purchases (local crafts and food, etc.)
3	Improvement and promotion of tourism marketing	Production and dissemination of brochures and other promotional materials
		Development of events and workshops
4	Strengthening of organizations and institutions	Capacity development (training) for administrative staff and tourism- relation human resources

Source: Prepared by JICA

No.	Tourism: Sub-sectors	Activity Group	Activities and Countermeasures	Affected ecosystem services (Based on TEEB)	Effects of activities and countermeasures (Risk avoidance / response, and opportunity enhancement)
1	Development and operation of tourism resources and infrastructures	1. Construction of tourism facilities	Design and construction of biodiversity-conscious facilities (minimum construction footprint and zoning, greenbelts, indigenous plants, landscape-harmonized designs, natural and permeable materials, etc.)	Regulating service (water flow regulation) Habitat and nursery service (habitat and nursery maintenance) Cultural service (creation of recreation and tourism opportunities, preservation of natural landscape)	- Avoid habitat fragmentation and secure ecological networks through zoning and strategic planning. - Strengthen rainwater infiltration and storage functions by utilizing permeable materials and green belts. - Create cohesion with natural landscapes and regional culture through landscape-harmonized design, thereby enhancing tourism, education, and recreational value.
			Introduction of renewable energy systems (solar, biomass, etc.)	Regulating service (climate regulation, air filtration) Provisional service (food, material, medical, and amenity resources)	- Reduce fossil-fuel consumption and GHG emissions by transitioning to renewable energy. - Reduce emissions of air pollutants by eliminating local pollution sources (wood stoves, generators, and boilers, etc.).
			Light-pollution mitigation measures (energy-efficient and ecosystem-friendly lighting design)	Regulating service (attenuation of noise and light) Habitat and nursery service (habitat and nursery maintenance)	- Maintain wildlife habitats by reducing the impact of light-pollution on wild species. - Reduce GHG emissions and improve operational efficiency through energy saving measures.
			Installation of water-saving sanitation facilities and rainwater storage and reuse systems (for toilets, showers, irrigation, etc.)	Provisional service (water supply) Regulating service (climate regulation, water flow regulation)	- Reduce water-depletion risks by lowering dependence on local water sources. - Strengthen resilience against floods and droughts.

Source: prepared by JICA

Figure 2 List of Response Measures to Ecosystem Impacts (Illustrative Image)

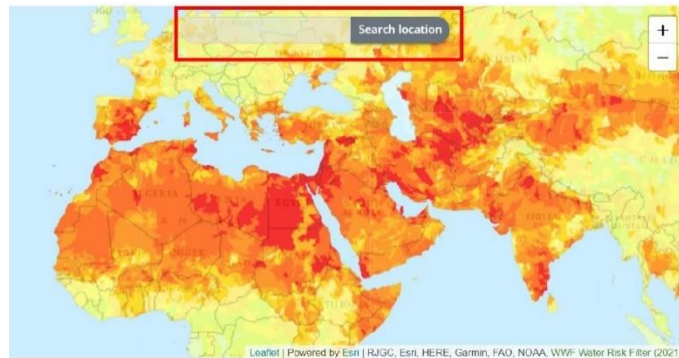
3.2 Step 2 : Identification of Ecosystem Impacts (Dependencies and Impacts)

By utilizing external tools such as the Biodiversity Risk Filter (BRF) provided by WWF¹³ (see Figure 3), this step geographically assesses the degree of dependency on and impact on ecosystem services identified in Step 1 at their points of interaction. This step is conducted during the implementation stage of the preparatory survey or the detailed planning survey.

The BRF is a tool that builds on sector-level dependency and impact assessments developed under ENCORE, while integrating region-specific biodiversity conditions, such as the distribution of protected areas, tree cover loss, and the habitats of threatened species, based on 33 indicators. Through this approach, the BRF enables a spatial understanding of biodiversity risks associated with project sites and target areas, thereby allowing for more refined risk assessments and the consideration of appropriate response measures.

¹³ WWF Biodiversity Risk Filter is an online tool provided by WWF that spatially visualizes biodiversity risks in a given area. <https://riskfilter.org/biodiversity/home>

Location-based information search is available



Source: WWF Biodiversity Risk Filter (WWF)

Figure 3 Example of an Ecosystem Risk Heat Map Generated by the WWF Biodiversity Risk

3.3 Step 3 : Examination of Response Measures to Ecosystem Impacts

During the implementation stages of the preparatory survey and the detailed planning survey, it is expected that appropriate response measures will be examined based on the points of interaction (dependencies and impacts) between project activities and natural capital and ecosystem services, with the aim of minimizing risks while also linking them to opportunities. As described above, the tourism sector is highly dependent on ecosystems and, at the same time, has the potential to exert significant impacts on them; therefore, the consideration of response measures constitutes a critical step that directly influences the sustainability of projects.

Response measures should not only mitigate risks, but also incorporate a nature-positive perspective by generating benefits for ecosystem restoration and local communities. In considering response measures, reference should be made to the annexed “List of Response Measures to Ecosystem Impacts,” from which activities that are both highly feasible and expected to deliver tangible effects should be selected. The list provides illustrative examples of response measures, organized by types of activities in the tourism sector, aimed at reducing ecosystem-related risks and enhancing opportunities. An illustrative image of the list is shown in the figure below, where the areas highlighted by red boxes indicate examples of response measures to ecosystem impacts.

Activities within each sector		Selected Countermeasures against Ecosystem Impacts and their Classification under Common Nature Finance Taxonomy		Proposed Evaluation Indicator • Ecosystem Indicators (divided by categories) • Social Indicators		Relevant Ecosystem Services and Effects of Response Measures		Contribution to GBF Targets	
No.	System Sub-activity	Activity Group	Activities and Countermeasures	MDB Category 1: 1. Conservation and Restoration / 2. Mitigation of Degradation / 3. Net 0. Nature and Regeneration	Proposed Evaluation Metrics	Affected ecosystem services (Based on TSD)	Effects of activities and countermeasures (Risk avoidance / response, and opportunity enhancement)	Contributions to GBF targets	Contribution type
					Response (Activities and Outputs) Pressure (Short-term Outcomes) State (Long-term Outcomes)				
1	Development and operation of tourism facilities and infrastructure	1. Construction of tourism facilities	Design and construction of biodiversity-friendly facilities (continuous observation, habitat and viewing, green roofs, indigenous plants, landscape harmonized design, natural and permeable materials, etc.)	>0.0	Vegetation coverage, provision of indigenous species	Water satisfaction, return rate, etc.	1. Biodiversity-friendly facilities and ecosystems through habitat and landscape planning. 2. Sustainable resource utilization and design functions by utilizing permeable materials and green roofs. 3. Local culture and traditional knowledge and regional culture through landscape design, thereby contributing to tourism, education, and research and other.	1. Habitat design and effective management, 2. Conservation of resources, 3. Genetic diversity, and management of natural resources, 4. Sustainable management of natural resources	○ ○
			Introduction of renewable energy systems (solar, biomass, etc.)	>0.1	Amount of renewable energy introduced	Long-term improvement in air pollution conditions	Reduction of renewable energy facility energy costs	Reduction of greenhouse gas emissions by utilizing renewable energy	○
			High-efficiency irrigation measures (water-efficient and occupation-friendly design)	>0.1	Number of occupation-friendly irrigation facilities	Properties of irrigation (water efficiency, short-term changes in irrigation)	Reduction of irrigation water consumption	Reduction of water consumption and improvement of water efficiency	○ ○
		2. Operation of tourism facilities (Biodiversity-friendly facilities, etc.)	Installation of water-saving irrigation facilities and rainwater storage and reuse systems (for toilets, showers, irrigation, etc.)	>0.1	Number of water-saving and rainwater storage facilities	Water use, quantity of rainwater storage	Long-term improvement in water use efficiency	Reduction of water consumption and improvement of water efficiency	○ ○
			Management and protection of on-site flora and fauna (including anti-invasive measures)	>0.1	Number of management and protection activities	Short-term changes in number of on-site species, number of management activities	Long-term improvement in biodiversity index	Reduction of on-site species loss and improvement of biodiversity index	○ ○
	2. Development and operation of tourism facilities (Biodiversity-friendly facilities, etc.)	3. Development and operation of tourism facilities (Biodiversity-friendly facilities, etc.)	Restoration measure against impacts on wildlife (habitat loss, wildlife damage, etc.)	>0.1	Number of restoration measures	State of impact on wildlife	Long-term improvement in biodiversity index	Reduction of impact on wildlife and improvement of biodiversity index	○
			Restoration measure against impacts on aquatic life (habitat loss, aquatic life damage, etc.)	>0.1	Number of restoration measures	State of impact on aquatic life	Long-term improvement in biodiversity index	Reduction of impact on aquatic life and improvement of biodiversity index	○
			Restoration measure against impacts on terrestrial life (habitat loss, terrestrial life damage, etc.)	>0.1	Number of restoration measures	State of impact on terrestrial life	Long-term improvement in biodiversity index	Reduction of impact on terrestrial life and improvement of biodiversity index	○
		4. Development and operation of tourism facilities (Biodiversity-friendly facilities, etc.)	Restoration of riparian and riparian of aquatic life (habitat loss, aquatic life damage, etc.)	>0.1	Number of riparian and riparian of aquatic life	State of riparian and riparian of aquatic life	Long-term improvement in biodiversity index	Reduction of riparian and riparian of aquatic life and improvement of biodiversity index	○ ○
			Restoration of riparian and riparian of aquatic life (habitat loss, aquatic life damage, etc.)	>0.1	Number of riparian and riparian of aquatic life	State of riparian and riparian of aquatic life	Long-term improvement in biodiversity index	Reduction of riparian and riparian of aquatic life and improvement of biodiversity index	○ ○

Source: prepared by JICA

Figure 4 List of Response Measures to Ecosystem Impacts and Related Information (Illustrative Image)

3.4 Step 4 : Setting Effects Indicators

During the implementation stage of the preparatory survey or the detailed planning survey, and following the examination of response measures in Step 3, effects indicators are considered in parallel in order to understand what results the proposed measures will deliver in terms of ecosystem conservation and restoration, as well as risk reduction. Two types of indicators are examined: “ecosystem indicators”, which measure the effectiveness of response measures from the perspective of the health and sustainability of the natural environment and ecosystem services; and “socioeconomic indicators”, which measure outcomes from the perspective of local communities’ quality of life, culture, social inclusion, and resilience.

In considering these indicators, it is recommended to refer to the indicator examples compiled for each response measure in the accompanying reference material, “List of Response Measures to Ecosystem Impacts,” while selecting indicators for which data collection is feasible, taking into account the specific characteristics of the project, as well as the local natural, social, cultural, and regional contexts. The list presents illustrative examples of “ecosystem indicators”¹⁴ and “socioeconomic indicators” that have been organized with reference to the MDB Guidance.

Ecosystem Indicators

- **Characteristics:** Indicators that measure the health and sustainability of natural capital and ecosystem services, based on international frameworks such as IPBES and TNFD

¹⁴ The MDB Guidance refers to “Financing Nature: A Practitioner’s Guide to Results Metrics Selection (Inter-American Development Bank, November 2025)”, which classifies and defines indicators into three categories: Response, Pressure, and State.

- **Examples:** Green space area; coverage ratio of native vegetation; biodiversity indices in and around tourism facilities; the area of wetlands and waterfront zones; water quality of rivers and waterside areas (e.g., BOD, COD, dissolved oxygen levels); the number of visitors to parks and Nationally Certified Sustainably Managed Natural Sites; the number of participants in ecotourism activities; the number of social media posts and other communications related to natural resources; and tourists' evaluation scores of the natural environment.

Socioeconomic Indicators

- **Characteristics:** Indicators that measure local communities' quality of life, well-being, inclusiveness, and resilience, from the perspectives of JICA's concept of Human Security and the Sustainable Development Goals (SDGs).
- **Examples:** Residential living environment satisfaction in tourist destinations; the number of flood incidents and the amount of economic losses during disasters in tourist areas; the number of users of public transport and pedestrian spaces; the number of tourism-related jobs created at the local level; the participation rate of women, elderly people, and other vulnerable groups in tourism-related activities; total tourism revenue in the region; and the rate of income increase for local residents generated through ecotourism.

These indicators not only enable the quantitative demonstration of project outcomes, but also serve as an evidence base for internationally reporting progress toward nature-positive outcomes.

3.5 Step 5: Examination of Monitoring Methods

During the preparatory survey or detailed planning survey stage, a monitoring framework should be developed based on the effect indicators established in Step 4. This framework enables the continuous tracking and evaluation of changes in ecosystems and local communities that occur following project implementation.

Examples of major monitoring methods:

- Fixed-point observation: e.g., regular measurement of green space coverage, biodiversity indices, water quality, and vegetation.
- Participatory monitoring: e.g., community-based recording of species and local activities by residents, as well as surveys on residential living environment satisfaction in tourist destinations.
- Use of remote sensing and GIS: e.g., monitoring land-use changes and ecosystem network connectivity.
- Regular review meetings: e.g., progress confirmation and issue-sharing among local governments, residents, and relevant stakeholders.

Examples of implementation arrangements:

- The project formulation department develops the monitoring plan and implements it in collaboration with local governments, research institutions, and NGOs.
- The project formulation department encourages active participation of local residents and farmers to establish a community-based monitoring framework.
- Monitoring results are expected to be utilized for project evaluation, feedback into subsequent planning, and international reporting on nature-positive initiatives through the Sustainability Promotion Office.