Natural capital underpinning the green economy

Introduction

Human life is supported by ecosystem services, but measuring those services accurately is difficult. One of the factors behind the worldwide decline in biodiversity is the failure to attach appropriate value to ecosystem services. In recent years, the concept of *natural capital* is attracting attention as a means of treating the natural environment as important capital that supports everyday life and the operating foundations of enterprises. Natural capital is the stock of soil, water, air, forest and other bioresources created by nature, and ecosystem services are the flow of goods and services yielded from this stock. Appropriate evaluation and management of natural capital can improve the sustainability of everyday life and business. This section introduces examples of Japanese government endeavors to evaluate natural capital and forward-looking private sector initiatives based on the concept of natural capital.

Quantitative evaluation of natural capital and ecosystem services

The National Biodiversity Strategy of Japan laid out a goal of promoting visualization of the economic value of biodiversity and ecosystem services as one of its goals. In FY 2013, the Ministry of the Environment assessed the economic value of ecosystem services provided by wetlands (both marshland and tidal flats).

As a result, the value of ecosystem services provided by marshlands and tidal flats all around Japan were estimated at 839.1 - 971.1 billion yen (marshlands) and 610.3 billion yen (tidal flats) respectively. It should however be noted that these estimated values represent only a small part of the total value of wetland ecosystem services.

Estimated economic value of the ecosystem services of Japan's marshlands

Ecosystem services		Economic value (/year)	Unit value (/ha/yr)
Regulating services	Climate regulation (CO_2 absorption)	Approx. 3.1 billion yen	High moors: Approx.14,000 yen Intermediate moors: Approx. 22,000 yen Low moors: Approx. 31,000 yen
	Climate regulation (Carbon sequestration)	Approx. 98.6 billion - 141.8 billion yen	High moors: Approx. 2.5 million yen Intermediate moors: Approx. 1.54 million - 1.77 million yen Low moors: Approx. 0.58million - 1.05 million yen
	Water regulation	Approx. 64.5 billion yen	Approx. 590,000 yen
	Water purification (Nitrogen absorption)	Approx. 377.9 billion yen	Approx. 3.43 million yen
Habitat services	Provision of habitat	Approx. 180 billion yen	Approx. 1.63 million yen
Cultural services	Preservation of natural landscapes	Approx. 104.4 billion yen	Approx. 950,000 yen
	Recreation and environmental education	Approx. 10.6 billion - 99.4 billion yen	Approx. 96,000 - 900,000 yen

Source: Ministry of the Environment

Estimated economic value of the ecosystem services of tidal flats

Ecosystem services		Economic value (/year)	Basic unit (/ha/yr)
Provisioning services	Food	Approx. 90.7 billion yen	Approx. 1.85 million yen
Regulating services	Water purification	Approx. 296.3 billion yen	Approx. 6.03 million yen
Habitat services	Provision of habitat	Approx. 218.8 billion yen	Approx. 4.45 million yen
Cultural services	Recreation and environmental education	Approx. 4.5 billion yen	Approx. 91,000 yen

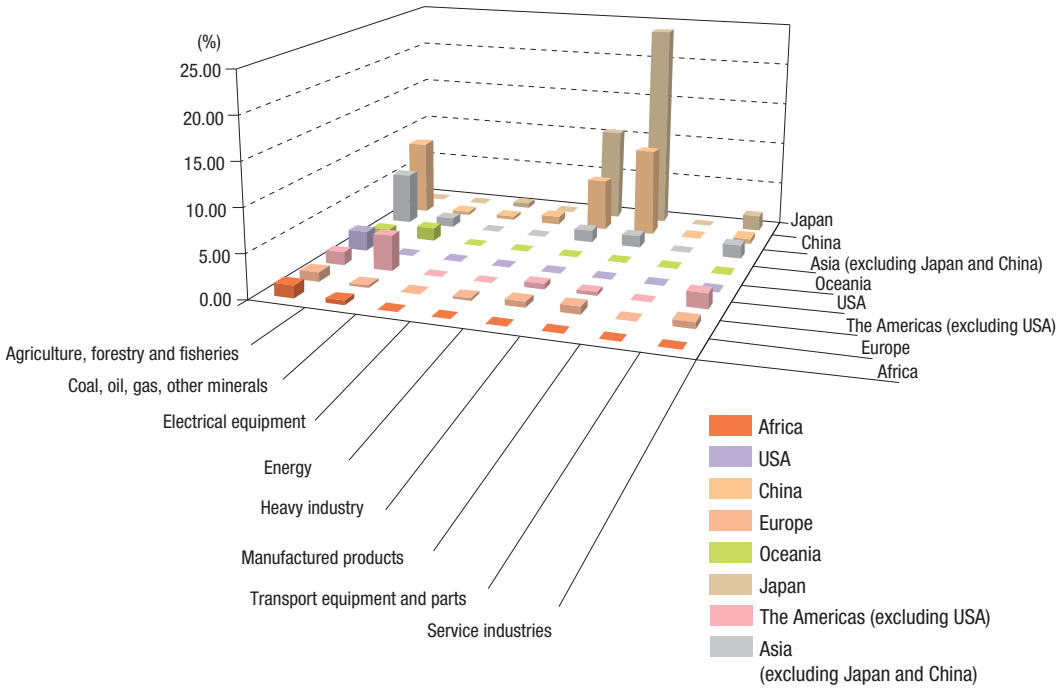
Source: Ministry of the Environment

Private sector initiatives based on the concept of natural capital—Natural capital evaluation-based environmental rating loans

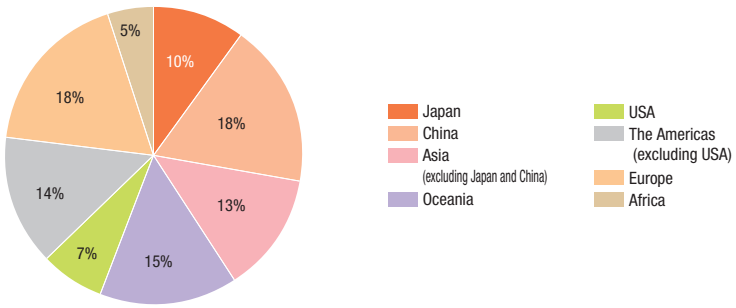
At the United Nations Conference on Sustainable Development, Rio +20 held in Rio de Janeiro in June 2012, the United Nations Environment Programme Finance Initiative (UNEP FI) announced the Natural Capital Declaration. Sumitomo Mitsui Trust Bank, Limited is the only Japanese signatory of the Declaration so far. In April 2013, Sumitomo Mitsui Trust Bank started to offer a product named Environmental Rating Loans with the Evaluation of Natural Capital Preservation that incorporates the concept of evaluating impacts and initiatives related to natural capital into its process for rating the environmental initiatives of businesses. Sumitomo Mitsui Trust Bank divides natural capital into five components; animals, plants, water, soil, and air. Among them they use water consumption, land-use area, and greenhouse gas emissions as criteria for evaluating the natural capital conservation efforts of borrowers.

Outputs according to natural capital evaluation

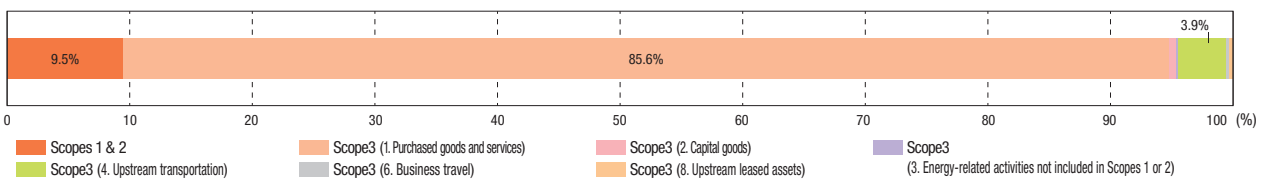
Water consumption according to sector and region



Land-use area share according to region



GHG emissions according to category



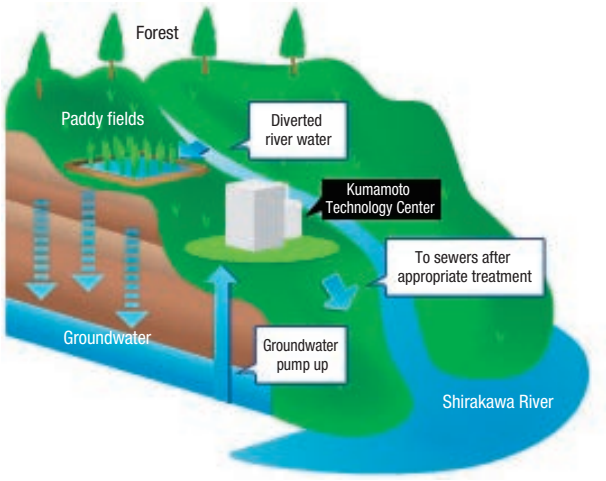
Source: Sumitomo Mitsui Trust Bank, Limited, complied by Ministry of the Environment

Incorporating a natural capital approach into operations

Water neutral factory

In its environmental management plan, Sony Corporation positions biodiversity as an important aspect of environmental activities, and attempts to conserve natural capital because it is a critical element for biodiversity. For example, Sony Semiconductor Corporation's Kumamoto Technology Center uses a large volume of groundwater in its semiconductor production processes. The Kumamoto region in which the Center is located has rich groundwater resources, but in recent years, groundwater levels have been falling. Recognizing that the region's groundwater is important natural capital, the Center launched a project to replenish it in 2003. With cooperation from surrounding farmers, it diverted river water to fallow season paddy fields to replenish the groundwater through infiltration into the ground, then paid farmers for their cooperation according to the number of days their paddy fields were flooded. As a result of this activity, the Center is replenishing the groundwater with approximately the same volume as used each year (including both utility tap water and groundwater).

Using paddy fields to replenish groundwater



Source: Sony Corporation

Helping plantations obtain certification

Kirin Group in Japan has been helping tea supplier plantations in Sri Lankan to obtain Rainforest Alliance certification since 2013.

Japan imports about 60% of its tea leaves from Sri Lanka, and among imported tea leaves from Sri Lanka, about 25% of them were used for Kirin products. Given these circumstances, the Group conducted a survey of supplier plantations and found that about 40% of them were certified as contributing to the conservation of biodiversity, whereas many of the remaining plantations were not able to obtain the certification due to financial reasons.

Therefore, in 2013, the Kirin Group launched an initiative to help these plantations obtain Rainforest Alliance certification and thereby improve the sustainability of the entire community.

Local government natural capital declaration

Interest in the concept of natural capital is growing in the public as well as the private sector. Shimokawa Town in Hokkaido has started to draw up plans for building a system for quantitative evaluation of its natural capital, thereby diverting funds for it so as to sustainably manage and nurture it for the future. In December 2013, Shimokawa Town announced the Shimokawa Town Natural Capital Declaration, stating its determination to incorporate the concept of natural capital into the management of its affairs.