# SATOAYAMA BANK: THE FIRST CASE OF BIODIVERSITY BANK ESTABLISHMENT IN JAPAN

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## 1. Objectives and Background of the Study

Globally, there is a growing focus on biodiversity conservation as well as climate change mitigation and adaptation (e.g., TNFD, Nature Positive).

In the Kunming-Montreal Framework, biodiversity offsets are mentioned as a way to achieve the target.

In biodiversity offsetting, there is also biodiversity banking, in which biodiversity conservation results are bought and sold on a coherent piece of land rather than offsetting on separate sites.

In Japan, on the other hand, biodiversity offsetting has not been mandated since the implementation of the Environmental Impact Assessment Act in 1997, although basic studies have been conducted. Therefore, there is no consensus on what constitutes no-net-loss, which is a prerequisite for biodiversity offsetting.

The reasons why biodiversity offsetting has not yet been implemented in Japan include the fact that there are very few examples of biodiversity offsetting for secondary ecosystems, that there is no set method for assessing the value of biodiversity, and concerns about greenwashing.

Japan's entire land area is a biodiversity hotspot. Furthermore, secondary natural environments (Satoyama ecosystems) created by humans cover 40% of the country and constitute the backbone of Japan's biodiversity.

However, Satoyama ecosystems are degrading due to spatial loss caused by development and management neglect and need to be created, enhanced, and protected in some way.

Although biodiversity offset banking has not yet been institutionalized, Japan's first biodiversity bank, the Tsubaki TC Satoyama Bank, was established in Chiba Prefecture in 2020 in anticipation of its institutionalization in the future.

This study aimed to clarify how voluntary biodiversity offsets in secondary ecosystems can prevent greenwashing through the estimation of no-net loss in actual development projects and biodiversity banks.

## 2. Methods of the Study

### 2.1. Organizing information about the conservation site

To obtain an overview of the conservation sites, we compiled information on the Tsubaki TC Satoyama Bank through a literature review and interviews with relevant individuals.

## 2.2. Organizing information on the development site

To obtain an overview of the development site, we compiled information on the development site through a literature review and interviews with relevant parties.

## 2.3. Organizing Definition of "No-Net-Loss" and evaluation methods and trial calculations

We reviewed the literature and organized definitions of No-Net Loss used worldwide and in Japan.

Next, we estimated the area of conservation sites required to achieve the NNL for each definition of actual development projects in Chiba Prefecture.

The trial calculations were based on the area of the site and classification of the land cover type, as determined by satellite imagery.

## 3. Results of the Study

## 3.1 Organizing information about the conservation site

Information regarding the conservation site (Tsubaki TC Satoyama Bank) is presented in Table 1.

The site was a Satoyama ecosystem consisting of mountain forests, slope forests, and rice paddies on a plateau typical of the northern part of Chiba Prefecture.

The area had been neglected for more than 30 years, and no large-scale management such as conversion of the forest phase is currently underway. However, 38 endangered species were identified: nine plant species, 4 insect species, one fish species, 4 amphibian species, five reptile species, 14 bird species, and one mammal species.

Table 1: Summary of Tsubaki TC Satoyama Bank

| Items | Information |
|---|---|
| Location | Ijino, Ijino-shinden, Imakura-shinden |
| Purpose of Establishment | Purpose of Establishment<br>To preserve a cohesive natural environment on a permanent basis |
| Area | 42.8ha |
| Mainly Land use | Japanese Cedar Forest, Quercus serrata forest, Paddy field |
| Endangered Species | *Crematis patens*, *Neozephyrus japonicus*, *Cynops pyrrhogaster*, *Butastur indicus* etc. |
| Status of Maintenance | Neglected for more than 30 years, pathways have been cleared, mowed in some areas, and regularly patrolled since April 2020. |
| Land Use Plan | Continuous Maintenance at least 30 years |

## 3.2. Organizing information on the development site

Information on the development sites is presented in Table 2.

Due to a solar power plant construction project in the northern part of Chiba Prefecture, 7.1 ha of secondary natural environment was developed. The main land uses were pine forests and farmlands.

Table2 : Organizing information about the development sites

| Items | Information |
|---|---|
| Location | Northern of Chiba (Tomisato City, Yachimata City, Shisui Town, Shibayama Town) |
| Purpose of Establishment | To set up 6 photovoltaic generation plants |
| Area | 7.1ha |
| Mainly Land use | Pine forest、Farm Land |
| Status of Maintenance | Neglected until it was developed |
| Land Use Plan | 1 year for installation, 20 years for power generation, and 1 year for removal (total 22 years) |

## 3.3. Organizing Definition of "No-Net-Loss" and evaluation methods and trial calculations

Table 3 lists the definitions of No-Net-Loss used worldwide and in Japan.

The survey results revealed that the definitions of No-Net-Loss can be broadly categorized into three types.

Based on these results, we calculated the area required for No-Net-Loss in the actual development project and the voluntary biodiversity offset for Tsubaki TC Satoyama Bank. The evaluation methods were (1) CSR-type, (2) HHa-type, and (3) HEP-type calculations (Table 3).
The (1) CSR-type also includes an evaluation method (1-2) that considers the condition of the green space and other factors.

For types (2) and (3), on cover type plants and wetland, the score for environmental quality was set at 6 points for unmanaged areas and 10 points for managed areas. In the case of artifacts, the score was set to zero, regardless of management status.

Table 4 presents the calculation results for the area required for the NNL.

For (1-1) and (1-2), NNL can be achieved by providing the same area as the development area; for (2) and (3), a conservation area 1.5 to 2.6 times larger than the development area was required.

Table 3: Definitions of No-Net-Loss used worldwide and in Japan

| | Case | Concepts for Calculation | Definition of NNL |
|---|---|---|---|
| (1) Like the CSR Reporting | CSR reports (Miyazaki and Momii, 2009) | Area of Open space | Development area= Conservation Area |
| (2) Like the HHa | Habitat Hectare Method (Nakashizuka, 2012) City development in Yamanashi Prefecture. (Showa town, 2005) | Area x Quality of Biodiversity | Score of Development area= Score of Conservation Area |
| (3) Like the HEP | HEP (Habitat Evaluation Procedure) (Tanaka, 2006) City development in Yokohama City (Tanaka et.al, 2008) | Area x Quality of Biodiversity x Time | Score of Development area= Score of Conservation Area |

Table 4: Results of trial calculation on actual project

| Calculation Method | Impacts by development | Effects by conservation on whole area of Satoyama Bank | Area to achieve NNL |
|---|---|---|---|
| (1-1) | 7.1ha | 42.8ha | 7.1ha |
| (1-2) | 7.1ha (Plants 7ha, Wetland 0.1ha) | 42.8ha (Plants 34.3ha, Wetland 8.5ha) | 7.1ha (Plants 7ha, Wetland 0.1ha) |
| (2) | 426,505pts (Plants 420,625pts, Wetland 5,880pts) | 1,714,955pts (Plants 1,373,906pts, Wetland 341,049pts) | 10.64ha (Plants 10.5ha, Wetland 0.14ha) |
| (3) | 8,530,104pts (Plants 8,412,504pts, Wetland 117,600pts) | 19,644,028pts (Plants 15,737,470pts, Wetland 3,906,558pts) | 18.55ha (Plants 18.3ha, Wetland 0.25ha) |

## 4. Conclusion

Based on the results thus far, there are three possible perspectives from which voluntary biodiversity offsets can prevent greenwashing.

### 1) NNL should be both qualitative and quantitative.

It is impossible to determine what the offset will be for without considering whether it will target the area of species habitats, the area of cover types such as vegetation, or both. Achieving NNL with such invisible offsets could lead to greenwashing, which "shows only the contribution to the natural environment while ignoring the negative impact of development projects on the natural environment. If it is not possible to communicate numerical values that anyone can understand, it may also be greenwashing.

For example, the trial calculation results in (1-1) do not indicate what is to be conserved. In other words, we do not know whether we are damaging the habitats of valuable plants and animals. In addition, all estimations produced quantitative results for at least one area. However, it is unclear whether this will really achieve NNL, since we do not know where, what, and how to do it just by talking about "managing unmanaged areas.

### 2) 1:1 correspondence between impacts and conservation benefits.

If offsets are made without discussing the correspondence between what impacts are offset by conservation benefits, it may be assumed that the offset is NNL, even though it is damaging the habitat and vegetation of valuable plants and animals, resulting in greenwashing.

A simple classification, such as (1-1) or (1-2) for example, allows for quick evaluation. However, endangered species have been found even in almost unmanaged areas, such as the Tsubaki TC Satoyama Bank, which is a conservation site. Therefore, there is a possibility that the habitat for valuable species will be overlooked if the classification is too general.

In contrast, land use in Japan is mosaic in nature. If an assessment is made using overly detailed classifications, a fragmented environment is created. This is an undesirable situation from the perspective of landscape ecology (Forman, 1984).

### 3) NNL cannot be achieved without actual land.

Returning to the meaning of No-Net-Loss, there was no decrease in the quantity and quality of biodiversity before and after development. In other words, "biodiversity offset without location" cannot achieve NNL forever. Voluntary biodiversity offsets that do not incentivize the provision of sites where the natural environment may be restored will not achieve the NNL. In other words, it may become greenwash.

Japan is a warm and rainy country. In many places in these countries, when human

involvement is eliminated, the environment changes to natural environments, such as broadleaf forests. If the quality of the secondary natural environment is disregarded, green spaces can be restored if they are in the right places. However, it is necessary to prepare a place that will not be developed. This "preparation of a place that will not be developed' should be applicable anywhere in the world.

References
Convention on Biological Diversity (2023) Kunming-Montreal Global Biodiversity Framework.
Koyama, Asuka and Okabe Kimiko (2017) Ecological issues in achieving no net loss of biodiversity offsets. Bulletin of FFPRI, Vol.16, No.2,p61-76.
Tanaka, Akira (2006) Theory and Practices for Habitat Evaluation Procedure (HEP) in Japan. Asakura Publishing Co., Ltd., Tokyo, 266pp
Tanaka, Akira, Osawa, Satoshi and Yoshizawa Maiko (2008) The First Application of Habitat Evaluation Procedure to Environmental Impact Assessment in Japan. Landscape Journal of the Japanese Institute of Landscape Architecture, vol.71, No.5, p543-548.
Tsubaki TC Satoyama Bank (2022) Information of Tsubaki TC Satoyama Bank. https://www.tsubakisatoyamabank.com/
Miyazaki, Masahiro and Momii,Mari (2009) Corporate social responsibility (CSR) to biodiversity—Study from the viewpoint of environmental sustainability—. JOURNAL OF ATOMI UNIVERSITY FACULTY OF MANAGEMENT, vol.8, p147-163.