

The Role of Mitigation in EIA Systems

Comparison of Japanese and American Experiences -

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THE ENVIRONMENTAL IMPACT ASSESSMENT SYSTEM AND MITIGATION

It has already been about a quarter of a century since the introduction of systemic arrangements for environmental impact assessments (EIAs) into Japan, in 1972. Over the intervening years, EIAs have been carried out for numerous development projects, and have made a valuable contribution to environmental preservation in Japan from the standpoint of preventing pollution. From the standpoint of preservation of natural land use in urban environments, however, Japan's EIA arrangements still face many issues. The following can be cited as the major two.

-Lack of compensation for loss of nature at the development site itself

-Performance of EIAs only in terms of individual projects, i.e., without EIAs of aggregate impact on the district

This has led to a contradiction of sorts, in that natural use of the land is being increasingly lost even as EIAs spread. (Tanaka 1995) This paper compares the positioning of authentic mitigation in the U.S. EIA system with that in the Japanese EIA system in respect of preservation of natural land use in urban environments, and presents suggestions about the advisable future approach to mitigation in the context of EIA systems, based on the findings of this comparison.

COMPENSATORY OFF-SITE MITIGATION IN THE U.S.

In the context of the EIA system in the United States, mitigation amounts to the avoidance or minimization of, or compensation for, negative impact on the natural environment due to development. (see Figure 1) Types of avoidance include suspension of projects and consideration of alternative options. In the EIA sequence, the primary focus is avoidance of negative impact. For negative impact that cannot be avoided, a study is then made of ways of minimization. And for impact that can be neither avoided nor minimized, the substance is compensation. (Federal Register 1981). Compensatory mitigation (the last type noted above) provides for compensation for the loss of nature at the project site itself, and does not exist in the Japanese EIA system. The following is a brief profile of EIA in the case of a riparian ecosystem restoration project in California in which the author was involved as a mitigation planner.

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He would like to locate research partners on comparative study on off-site compensatory mitigation such as wetland restoration from the U.S. and Asia.

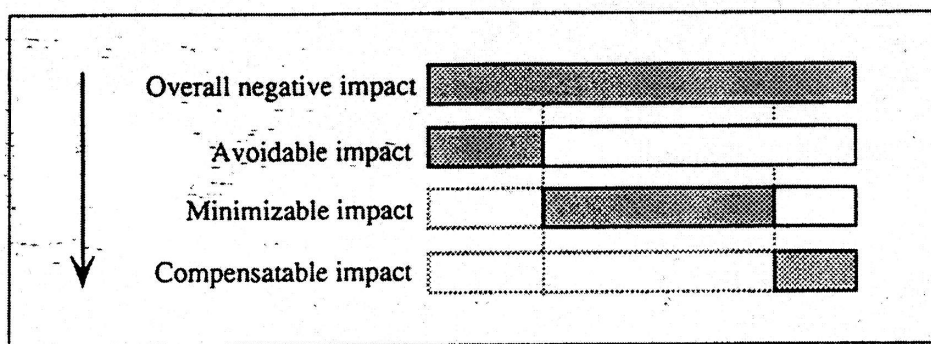


Figure 1 Sequence of mitigation

MITIGATION -PROJECT FOR IMPACT ON RIPARIAN ECOSYSTEMS IN CALIFORNIA

The project was aimed at construction of a golf course on land near Sacramento, California, that was part of the riparian ecosystem of the Sacramento River. Based on the findings of the EIA study, the developer was compelled to implement restoration works for the riparian ecosystem over an expansive area. This is because the on-site EIA study revealed the presence of the Valley elderberry longhorn beetle, which is classified as a threatened species. The site slated for development contained 16 acres with elderberry vegetation, the natural habitat of this species. The developer was required to restore this elderberry vegetation environment on an area measuring 48 acres, or three times as many as on the site, at a location as close to the site as possible and in the same basin. In addition, it was determined that other ecosystems would be lost also, and the developer was ultimately forced to restore a total of 193 acres in riparian vegetation.

CASES OF MITIGATION IN JAPAN

In Japan, the term "mitigation" has not yet been officially defined. As ordinarily used in recent years, it has three meanings or referents. The first is the technology for preservation of the natural environment in coastal zones, and dates from the introduction into Japan of technology used for construction of artificial seaweed grounds and tidelands on the California coast. Mitigation in the genuine sense refers to not only technical but also systemic provisions, and its subjects include upland and upland water bodies as well as coastal zones. The second is the compensatory mitigation that is the last of the five categories applied in the United States. Lately, the need for compensatory mitigation has finally begun to be discussed in Japan, too. The third is ecological restoration as a whole. Under the influence of what is known as "biotope rehabilitation" in Germany, the last few years have seen the nationwide spread of activities for restoration of habitats for insects and other small wildlife. As an example of policy operation, the following is a brief outline of administrative guidance for preservation of greenery related to golf course development.

Table 1 Meanings of "mitigation" as used in Japan

1	Technology for preservation of coastal zone environments
2	Same as compensatory mitigation in the U.S.
3	General term for restoration of the natural environment

REGULATORY PROCEDURES FOR PRESERVATION OF GREENERY IN GOLF COURSE DEVELOPMENT PROJECT IN JAPAN

Historically, besides implementing legislation and regulations that have been enacted by representative assemblies, government in Japan, whether national or local, has also implemented administrative guidance at its own discretion. In deciding whether to approve plans for golf course construction, authorities also apply administrative guidelines that are separate from the EIA system. In Chiba prefecture, which is adjacent to Tokyo and was a scene of rampant development of golf courses in the late 1980s and early 1990s, the 1973 administrative guidelines stipulated that at least 40 percent of the golf course area must be forested. In 1991, however, a revision was made to the effect that the golf course must retain at least 30 percent of the preexisting forested area on the site and that at least 50 percent of the golf course area must be forested (Chiba Prefectural Government 1973, 1991). The 1973 guidelines did not mention any particular type of forestation, and it was customary in reality to cut down all of the preexisting forests on the development site and then carry out afforestation to meet the 40-percent requirement. By contrast, the 1990 guidelines require preservation of at least 30 percent of the preexisting forests, and reflect more concern for the indigenous ecosystem

EMERGENCE OF MITIGATION BANKS LINKED TO LOCAL LAND USE PLANS

In the United States, compensatory mitigation off the site of development has led to the emergence of mitigation banks. (see Figure 2) These constitute a scheme whereby land for ecosystem restoration is secured off-site for the developer, and the restoration activities there are used as credit in sale of the restored land to the developer. While the mitigation bank is therefore a third party, enterprises constructing railways, roads, or other continuous facilities can also establish their own mitigation banks. Mitigation banks offer the following benefits.

- *They are market-oriented approaches to preservation of natural land use in urban environments, and therefore lighten governmental cost burdens.*
- *For developers, they reduce risks associated with mitigation and eliminate wasteful construction delays.*
- *There is a high success rate in ecosystem restoration, which is carried out by experts.*
- *The banks furnish financial resources for acquisition of land for preservation of the natural environment.*
- *Through linkage with urban and regional plans, they promote the realization of more rational land-use plans.*

Table 2 Comparison of environmental preservation policy related to golf course development in Japan and the U.S.

Terms		Japan	United States
Surrounding area including development sites	Quantity	The (physical) area of natural tracts The quantity of nature is preserved through compensatory mitigation, decreases with every golf course development project, due to lack of provisions for off-site compensation for the on-site ecosystem.	The quantity of nature is preserved through compensatory mitigation.
	Quality	The quality of nature in the area is simplified (homogenized) as the number of cases of development increase because, although there are provisions for transplantation of rare individual species of plant life to remaining off-site natural tracts, there is no assurance of preservation of the transplantation sites.	Preservation on the area-wide level is assured by efforts to restore equivalent quality ecosystems under the scheme of compensatory mitigation; however, considerable time is required for restoration of equivalent quality.
	Scheme for preservation of the natural environment	EIA affords a certain degree of consideration for impact on the area surrounding the development site, but does not clearly provide for preservation of the area-wide natural environment in both the quantitative and qualitative aspects.	Efforts are made to preserve the area-wide natural environment in both the quantitative and qualitative aspects through EIA taking account of linkage with area plans as well as alternatives and cumulative impact. The federal government advocates a policy of no net loss for the natural ecosystems in the area
On the site of development	Quantity	Administrative guidelines call for preservation of at least 30 percent of the pre-existing forestation and coverage of at least 50 percent of the site with forestation, consisting of both pre-existing and newly planted.	Various mitigation provisions also assure a fixed quantity of natural tracts on the site. The required rate of forestation varies depending on the scarcity of the species.
	Quality	There are no particular stipulations regarding the composition of the forestation under the 50-percent rule or types of ecosystem. Even forests of scarce species could be logged as long as 30 percent of the trees are left standing. The focus is forestland; there are no stipulations for preservation of wetland, grassland, or other types of ecosystem. The result is a simplification (homogenization) of nature.	Various mitigation provisions enable preservation of ecosystems in a highly natural state. In cases where this is not possible, compensatory mitigation demands the restoration of highly natural ecosystems of equivalent quality either on or off the site. However, such restoration takes considerable time.
	Scheme for preservation of the natural environment	Based on administrative guidelines for golf course development.	Based on the EIA system, which requires various sorts of substantial mitigation linked with area planning.
Summary		Progressive development would eventually make the nature of golf courses virtually the only nature left in the area. The area-wide natural ecosystems would go into decline in both quantitative and qualitative terms.	In quantitative terms, the natural ecosystems in the area either remain unchanged or, on the contrary, expand. In qualitative terms, however, there is inevitably some decline due to the time required for restoration.

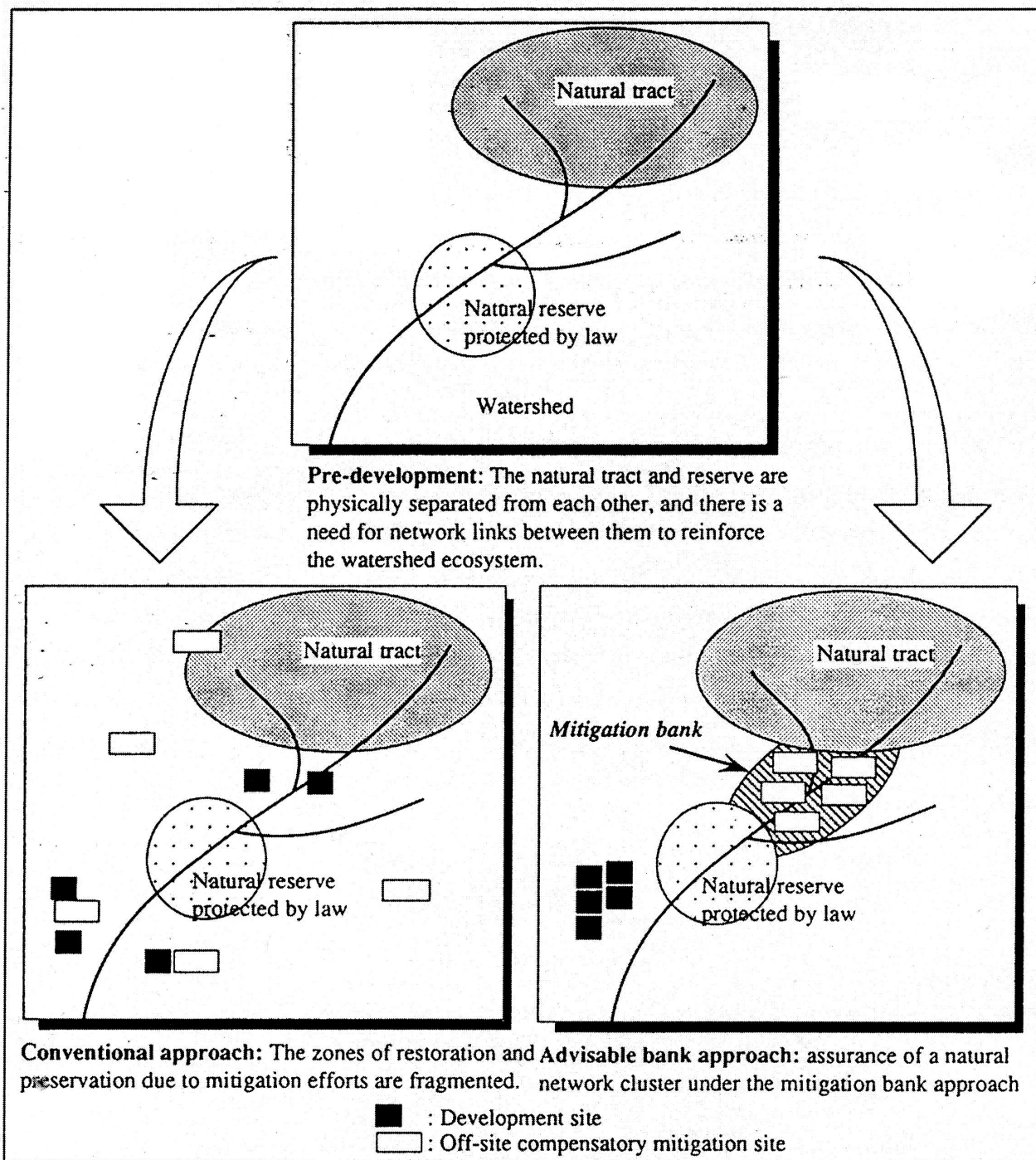


Figure 2 Off-site compensatory mitigation linked with land use planing

ADVISABLE APPROACHES TO EIA AND MITIGATION AS TOOLS OF PRESERVATION OF NATURAL LAND USE

The aforementioned case of administrative guidelines for golf course development in Japan evidences the limits of the country's EIA system for halting absolute loss of natural tracts in the surrounding area. In the future as well, there is consequently a good possibility of the emergence of various other administrative procedures that are outside the EIA system and aimed at substantial protection of the natural environment. In the United States, by contrast, mitigation banks that are linked with country's EIA system are expected to spread as market-oriented approaches to preservation of natural environments (White House Office on Environmental Policy 1993).

The Japanese government is currently making preparations for the enactment of national EIA legislation. At present, there are various systems and schemes applied to development projects, and the procedures are consequently hard to understand not only for businesses and citizens but also for the authorities themselves. There is a need for consolidation of these various procedures around the EIA system in the interest of comprehensibility and simplicity. To this end, it is essential that mitigation be clearly incorporated into the EIA system. The concerns of consensus-building in EIAs should be comparison and study of the magnitude of environmental impact as determined by EIAs and the extent of mitigation proposed by the developer (see Figure 3). In EIAs, efforts to achieve mitigation could very well build consensus and foster the growth of development reflecting proper concern for the environment.

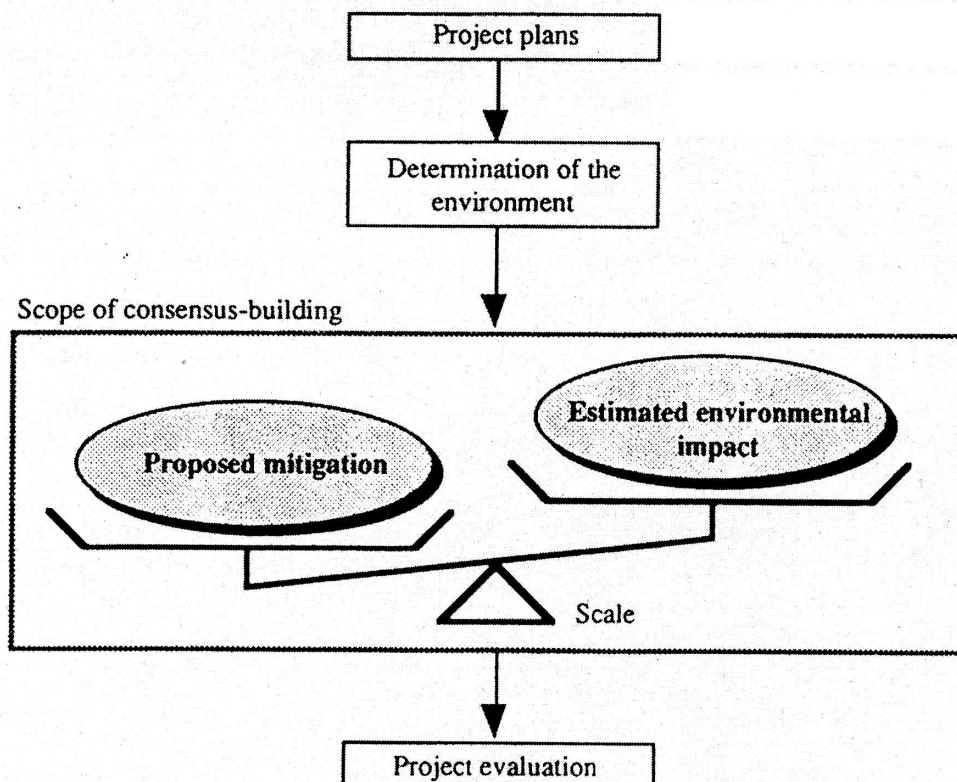


Figure 3 Positioning of mitigation in EIA (conceptual diagram)



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