Evolution of Mitigation Provisions in Japanese Environmental Impact Assessment Systems

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Synopsis

This paper aimed to elucidate the relationship between the effectiveness of environmental impact assessment (EIA) systems and mitigation in terms of ensuring conservation in natural land use, and make recommendations on their desirable forms. Firstly, the evolution of mitigation provisions in successive Japanese EIA systems was summarized based on EIA objectives and definitions included in various EIA regulations/guidelines introduced to date. Secondly, the evolution of mitigation in the United States, the country where the world's first EIA system was introduced, was studied. Thirdly, mitigation provisions in Japan, where environmental impact assessment has just been legislated, were examined, taking into account the differences in circumstances between Japan and the United States. Attributing the relative ineffectiveness of Japan's EIA systems to a lack of clear mitigation provisions, the paper concluded that improvements in mitigation provisions were the key to raising their effectiveness.

1. Background and Objective of Paper

Japan's successive environmental impact assessment (EIA) systems have not been very effective in the conservation of the natural environment, and the main reason for this is a lack of clear mitigation provisions. Mitigation means activities designed to avoid, minimize or compensate for environmental impacts arising from a proposed development project. (Tanaka, 1995b). This definition is summarized in Fig. 1.

The objective of this paper is to elucidate the relationship between the mitigation provisions in EIA systems and their effectiveness, and make recommendations on their future desirable forms in Japan. The paper first examines the evolution of mitigation provisions in Japanese EIA systems, as they appear in EIA objectives and definitions included in various EIA guidelines and regulations introduced to date. Secondly, it examines the evolution of mitigation in the United States, where an EIA system and the mitigation concept were first introduced. Thirdly, it looks at future desirable forms of EIA systems and mitigation in Japan, where environmental impact assessment has just been legislated, taking into account the differences in circumstances between Japan and the United States.

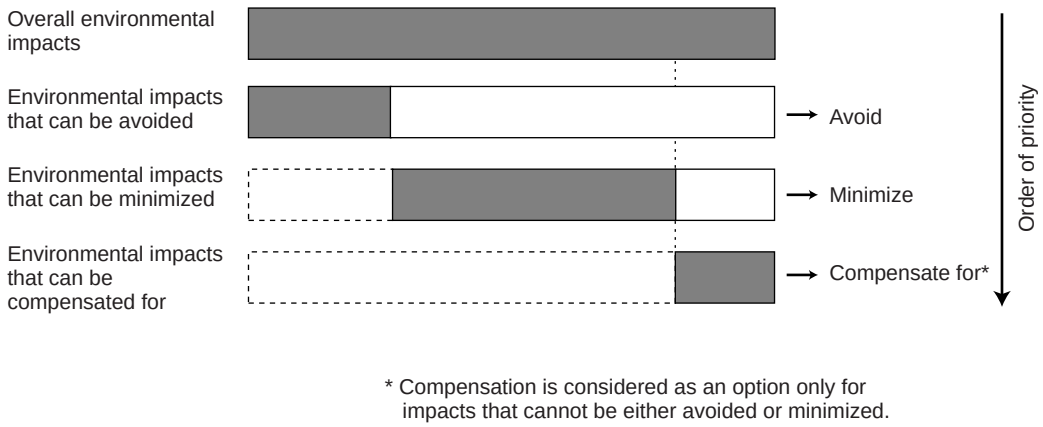


Fig. 1 Definition of Mitigation

2. Evolution of Mitigation in Japan's EIA Systems

Japan's first national-level EIA system was introduced with a 1972 cabinet agreement titled "Environmental Conservation Measures in Public Works Projects" (Environment Agency, 1993). Since then, several national-level EIA systems have been introduced, including the latest Environmental Impact Assessment Law of 1997. Table 1 summarizes the definitions/objectives of EIA included in various guidelines/regulations, as well as the evolution of the mitigation concept featured in these guidelines/regulations.

Along with regret over terrible environmental pollution in the 1960s, the establishment in 1969 of the world's first EIA system in the United States through the enactment of the National Environmental Policy Act (NEPA) became the catalyst for the introduction of an EIA system in Japan (Harashina, 1994), leading to the adoption of the above 1972 cabinet agreement, which was more like mitigation guidelines than EIA guidelines.

Table 1 Evolution of Mitigation Concept in Definition/Objectives of EIA in Japan

Date of introduction/ establishment Name of regulations etc.	Extracts from regulations etc. giving definition or objectives of EIA	Author's comments on perception of mitigation (environmental considerations)
June 6, 1972 "Environmental Protection Measures in Public Works Projects" (cabinet agreement)	National administrative bodies should have the implementers of public works projects under their respective jurisdictions conduct an advance environmental impact study encompassing, among other things, the nature and degree of the likely impacts of the projects on the environment, environmental destruction prevention measures and a comparative study of alternative plans, collect the results of the study, and provide guidance on the implementation of necessary measures, etc., as necessary.	Clear mitigation requirements are included, as this is a cabinet agreement dedicated to "environmental protection measures" based on a prevention philosophy which was a product of serious soul-searching over severe pollution problems.
June 24, 1974 "Operational Guidelines on Environmental Impact Assessment" (interim report) Central Council for Environmental Pollution Control's Prevention Planning Committee Environmental Impact Assessment Subcommittee	Here, environmental impact assessment refers to prediction and advance assessment (including reassessment) of the degree and scope of likely impacts of developmental activities on the environment, encompassing, among other things, atmosphere, water, soil and living organisms, and prevention measures. It includes a comparative study of alternative plans. In Japan, the approach of weighing the merits and demerits of development has not customarily been adopted in environmental impact assessment. Against this background is the fact that the most pressing environmental issue has been to address rampant industrial pollution and the resulting damage to human health. This has firmly established pollution control as the absolute goal of environmental protection-particularly in the eyes of the public-thus creating an atmosphere where it is unacceptable to even compare it with more economically-oriented goals. For this reason, the most important task in environmental impact assessment in Japan is to set suitable environmental quality standards to be maintained and assess environmental impacts objectively in these terms.	Although the mitigation concept is included as "pollution prevention", a departure from the original concept of EIA, which is to assess projects in terms of balance between negative environmental impacts (problems) and mitigation measures (solutions), occurred, due largely to the justification of the use of environmental quality standards as assessment criteria. Also, mitigation basically ceased to be an issue for consideration, as far as nature and other elements of the environment for which quantitative standards did not exist were concerned. A substantive approach (e.g. reliance on environmental quality standards), as opposed to a procedural approach, tends to give rise to omissions and oversights (i.e. failure to control). Prior to the 1990s, Japan's EIA system was run in a very substantive manner.
April 10, 1979 "Model of Environmental Impact Assessment System" (report) Chairman of Central Council for Environmental Pollution Control	Regarding activities with the potential to have severe impacts on the environment, preventing environmental pollution by subjecting them to environmental impact assessment forms an essential precondition for ensuring environmental protection. The following are major items to be incorporated in the EIA system: (1) types of projects to be covered; (2) parties that conduct EIA; (3) scope of the baseline study, prediction and assessment to be undertaken by project proponents as well as the range of procedures to be followed by them; (4) roles or functions of the national and local governments; (5) rules for participation by community residents from areas likely to be affected. It appears appropriate to have the environmental impact assessment system focus on establishing procedures whereby the proponent of a development project undertakes a baseline study, prediction and assessment with regard to the major likely impacts of the proposed project on the environment prior to the adoption of a project plan and seek the opinions of competent administrative authorities and community residents from areas likely to be affected on the environmental impact statement produced by them by compiling the results of the baseline study, etc.	As is apparent from the use of the expression "environmental pollution", rather than "environmental problems", the report specifically targeted pollution problems. Another shortcoming of the report is an oversight of the fact that some adverse impacts of a project always remain, as not all environmental problems are "preventable". In other words, a system based solely on the concept of "prevention" is inadequate, in light of the fact that there are no development projects that have no adverse impacts on the environment. EIA is considered synonymous with "a baseline study, prediction and assessment", and there is no mention of mitigation. Here, EIA is recognized as an environmental research tool, rather than a planning tool, and this is believed to be a factor that eventually led project proponents to view EIA as nothing but an added cost.

August 23, 1984 Guidelines titled "Implementation of Environmental Impact Assessment" (cabinet decision)	A project proponent shall, when wishing to implement a project to which these guidelines apply, undertake a baseline study, prediction or assessment with regard to the possible impacts of the proposed project on the environment and prepare a preparatory document for the environmental impact statement containing the following information: (1) name and address; (2) aim and nature of the project; (3) outline of study results; (4) nature and extent of likely impacts of the implementation of the project and measures for pollution prevention and nature conservation; and (5) assessment of the likely impacts of the project.	The concept of mitigation is more clearly recognized than the final report discussed under the preceding item. Nevertheless, the scheme "baseline study, prediction and assessment = EIA" was by then already entrenched, and mitigation was not discussed well in environmental impact statements prepared around this time.
November 27, 1984 "Basic Matters regarding Study, Prediction and Assessment in Environmental Impact Assessment" (decision of Director General of Environment Agency)	Regarding pollution-related items, assessment should be undertaken in terms of environmental quality standards, taking into account investigation results concerning pollution prevention measures. Regarding nature-related items, assessment should focus on a quantitative or qualitative prediction on changes in their state, taking into account conservation standards set according to their importance.	Mitigation provisions are unclear for nature-related items, for which it is difficult to set environmental quality standards. Assessment that takes mitigation into account right from the beginning cannot clearly differentiate, among other things, the environmental impacts without the proposed project, impacts of the project without mitigation measures and impacts of the project with mitigation measures.
November 19, 1993 Basic Environment Law (legislation)	The National Government must, when adopting and implementing a policy measure expected to have impacts on the environment, give due consideration to environmental conservation. It shall take the necessary measures to ensure that a project proponent wishing to implement a project involving reshaping of land, construction of a new structure, or the like conducts an appropriate baseline study, prediction and assessment with regard to the likely impacts of the project on the surrounding environment prior to its implementation and gives due consideration to environmental conservation.	The concept of mitigation is incorporated. The Basic Environment Plan, a cabinet decision adopted in 1994 on the basis of this law, provides that "public works projects undertaken by the National Government for the development of social capital infrastructure and other purposes shall be subject to an environmental conservation study including a baseline study/prediction regarding the possible impacts of its implementation on the environment from the planning stage, with appropriate considerations made".
February 10, 1997 "Model of Future Environmental Impact Assessment System" Report of Central Council for Environment (report)	The objectives of the environmental impact assessment system are as follows: to set procedures whereby project proponents undertake a baseline study, prediction and assessment with regard to the possible environmental impacts of their proposed projects with the participation of other parties such as local governments and community residents, to ensure that they make appropriate environmental conservation considerations based on adequate environmental information in the process of shaping the details of their project plans; and to have the results of these activities adequately reflected in the approval and other decision-making processes for such projects.	An investigation into mitigation (i.e. environmental consideration) is clearly recognized as an objective of EIA. Moreover, the report requires that "in undertaking an environmental impact assessment, a stance of pursuing the avoidance and reduction of environmental impacts as far as possible be taken in addition to the clearance of environmental quality standards and other administrative targets".
May 13, 1997 Environmental Impact Assessment Law (legislation)	"Environmental impact assessment" consists of a baseline study, prediction and assessment with regard to the likely environmental impacts of the implementation of a proposed project for each criterion for each element of the environment, an investigation into suitable environmental conservation measures for the project as part of this process, and a comprehensive assessment of environmental impacts assuming the implementation of such measures.	An investigation into mitigation measures is specified. However, an assessment of environmental impacts assuming the implementation of such measures is still permitted as in earlier systems, and this threatens to hinder the introduction of substantial mitigation measures due to the lack of a clear distinction between different types of impacts as mentioned above. Clear guidelines on mitigation policies must be prepared in addition to technical guidelines.

Note: Underlining was done by the author.

However, the release in 1974 of “Operational Guidelines on Environmental Impact Assessment”, which gave legitimacy to the use of environmental quality standards as assessment criteria, marked a watershed, and from this point onwards the focus of EIA in Japan gradually shifted away from the planning and implementation of substantial mitigation measures to the achievement of environmental quality standards “on paper” — meaning good figures in environmental impact statements (EISs). While environmental quality standards are useful in improving the environment in situations where pollution has already set in but are originally of little use in indicating environmental quality that should be maintained (Society of Chemistry, Japan, 1979). Such a system tends to obscure and confuse the distinction between the achievement of set environmental protection targets and justifiability of development projects in terms of the issuance of approval/permits, and drives project proponents to single-handedly pursue the achievement of such targets on paper as if it were the ultimate goal of environmental impact assessment, rather than striving to come up with concrete mitigation measures and make genuine improvements to proposed projects. It also tends to hinder, and delay the progress of, studies on substantial mitigation measures in the area of nature conservation, where qualitative targets have not been replaced by quantitative targets, unlike other areas such as air and water pollution control (OECD, 1991).

Moreover, because the EIA procedure under the above system allowed the “assessment” process to be carried out on the basis of the implementation of certain “mitigation measures” which were not clearly proposed in EIA reports (EISs), an illogical and back-to-front argument “there will be no impacts on the environment as such-and-such mitigation measures are to be taken” became widespread in EISs. This is the “fundamental flaw and intrinsic problem” of Japanese EIA systems (Shimazu, 1993). In such EISs, the following three points are not clarified: (1) environmental impacts likely to be caused by development without mitigation; (2) proposal of substantial mitigation measures against such environmental impacts; and (3) adverse impacts that will still remain after the implementation of such mitigation measures.

In the early 1990s, the concept of mitigation reappeared in the definitions and objectives of EIA, as can be seen from, for example, “Desirable Form of the Basic Environmental Law System” (1992) — although this represents a change in attitude toward environmental policies in general rather than in the perception of EIA itself. Namely, regret over Japan’s traditional environmental management policy, which centered on narrowly-focused ad hoc/end-of-pipe technical arguments, led to a gradual shift in emphasis towards more prevention-oriented comprehensive planning, as can be seen from the introduction of the Basic Environment Law and Basic Environment Plan. Obviously, such developments are related directly to global environmental movements, including the Earth Summit, Agenda 21 and the sustainable development movement.

On June 13, 1997, Japan enacted its Environmental Impact Assessment Law, as the last country to do so among OECD member countries (Environment Agency Environmental Impact Assessment Study Group, 1996). The law incorporates the concept of mitigation using expressions such as “environmental conservation measures” and “considerations for environmental conservation”, and gives it a clearer definition than the 1984 cabinet decision, its predecessor. Article 3 of the law states: “(the National Government etc.) must, in their respective capacities, strive to ensure that due consideration is given to environmental conservation (mitigation) through, among other things, the avoidance or reduction of environmental loadings (impacts) stemming from the implementation of development projects, wherever possible”. This shows that “avoidance” and “reduction” are clearly specified as concrete forms of mitigation. Articles 33 through to 38 provide for the evaluation of, and follow-up on, “considerations for environmental conservation”, thus constituting an improvement over the previous guidelines based on the 1984 cabinet decision, despite the fact that a degree of vagueness of definition of mitigation remains.

3. Evolution of Mitigation in US EIA System

To gain an understanding of mitigation policies in general, development of mitigation systems in the U.S. were analyzed, where EIA and mitigation systems originated, taking into account the characteristics on environment of each different period. Here, we concentrated on mitigation aimed at the conservation of ecosystems, which is both a rallying point for active conservation movements in the United States and a focus of widespread interest in Japan.

(1) Pre-introduction phase (Up to mid 1960s)

The first instance of the term “mitigation” appearing in the US legal system was the 1958 amendment of the Fish and Wildlife Coordination Act of 1934, and mitigation was defined as “reducing the decline of wildlife and compensate for the decline of wildlife” in its 1979 implementing regulations (Savage, 1986). The Wilderness Act of 1964, enacted around this time, was “an attempt to set a guideline on how much nature, particularly wilderness, was needed or needed to be preserved on the American Continent” (Okajima, 1990), and was the institutionalization of the idea of absolute preservation of wilderness based on a brand of naturalist thinking which rose around the mid 19th century and passed on from Emerson to Thoreau and Muir. The publication in 1962 of Carson’s “Silent Spring” pioneered the introduction of the concepts of “environment” and “carrying capacity”, which viewed mankind as part of nature’s ecosystems and food chain, to the American public, who had already developed an awareness of nature, partly through their frontier tradition.

The fact that the American approach to environmental protection has its roots in nature protection seems to be a factor that brought about the introduction of substantial mitigation regulation on ecosystem conservation and this is in stark contrast to Japan's environmental protection, which evolved from industrial pollution control.

(2) Introduction phase (From mid 1960s to mid 1970s)

Both the National Environmental Policy Act (NEPA), the world's first national EIA legislation, and California Environmental Quality Act (CEQA) were enacted in 1969, and put into effect the following year. These acts made the preparation of an environmental impact statement (EIS) or environmental impact report (EIR) compulsory, while clearly calling for the inclusion of a mitigation plan as a mandatory reporting item, along with the project objective, a project plan, alternatives and environmental impacts.

Upon establishing the nation's basic environmental policy principles with the enactment of the NEPA, the Nixon Administration of the time declared the 1970s the Environmental Decade, and the United States' basic legislative framework for environmental protection was established (Kraft & Vig, 1990). In 1972, the Clean Water Act Section 404, which provided the legal basis for off-site compensatory wetland mitigation centering on creation and restoration, was enacted.

Around this time, the mitigation concept was firmly established as part of the EIA system, and the practice of making the approval of a project conditional on the introduction of mitigation measures aimed at offsetting the adverse environmental impacts of development became widely accepted.

(3) System and technique development phase (From mid 1970s to mid 1980s)

In 1975, the Clean Water Act Section 404 was amended. This accorded the right of veto to the Environmental Protection Agency (EPA) on the issuance of permits for modifications to navigable waters, over which the U.S. Army Corps of Engineers had power. The Fish and Wildlife Coordination Act was also amended, making the issuance of permits for wetland development projects subject to advice by the US Fish and Wildlife Service and the National Marine Fisheries Service (Parry, 1993). As a result, EIAs for wetland development projects, including modifications, and their associated mitigation plans became subject to approval by competent authorities in charge of the conservation of ecosystems, such as the EPA and the US Fish and Wildlife Service.

Against this background, a definition of mitigation was issued by the Council on Environmental Quality (CEQ) through CEQ Implementing Regulations for the NEPA (40 CFR Part 1508.20) in 1978, which states that mitigation means the following five activi-

ties: avoiding, minimizing, rectifying or reducing impacts arising from development projects, and compensating for remaining impacts (Tanaka, 1995a).

The amendment of the Clean Water Act Section 404 made it compulsory to preserve waters which would disappear as a result of modification activities, both quantitatively and qualitatively. However, as no developmental activity can totally avoid the destruction of nature including wetlands at least within the project area, the compulsory restoration and creation of wetlands as "an off-site compensatory activity" was introduced.

As public interest in the local environment grew, the interpretation of "waters" under the Clean Water Act Section 404 was expanded from navigable waters only to include "all waters" of the United States (Dennison, 1996). With the flood plains of rivers and dry riparian forests on natural levees included in the scope of preservation (Kramer, 1981), mitigation targets were expanded, and wetland mitigation was extensively undertaken.

In this and ensuing periods, a string of mitigation guidelines and technical manuals were released by federal government organizations, such as the EPA and the U.S. Army Corps of Engineers, as well as state government organizations. These included "Wetland Creation and Restoration: The Status of the Science", published by the EPA in 1989, and "Riparian Planting Design Manual for the Sacramento River, Chico Landing to Collinsville" published by the U.S. Army Corps of Engineers, Sacramento District, in 1986, the latter being a compilation of the latest techniques and knowledge at the time on the regeneration of riparian forests for a particular river. The Wetland Regulations Guidebook, published by the Washington State Department of Ecology in 1988 as an informative pamphlet aimed at project proponents, explains the ecological facts about wetland development, and the regulatory basis and approval systems of competent authorities encompassing EIA, mitigation, etc. in an easy-to-understand manner.

(4) Policy technique development phase (From mid 1980s to present)

The Mitigation MOA (Memorandum of Agreement) concluded between the EPA and the U.S. Army Corps of Engineers in 1990 reduced the number of elements in the definition of mitigation from five to three (avoidance, minimization and compensation), specifying their priorities in that order (Environmental Law Institute, 1993) (Fig. 1).

In 1988, then President Bush put forward the wetland "no net loss" policy as an election promise (Vig, 1990). This policy intended to preserve the functions and values of all existing wetlands in the United States. In 1993, President Clinton recognized the mitigation bank system as a desirable environmental conservation technique and promised his support (Tanaka, 1996). A mitigation bank is a concept devised by the US Fish and Wildlife Service in the early 1980s (Dennison, 1996), which expresses on-site compensa-

tory mitigation activities as “credits” that can be sold or bought (Tanaka, 1995a). These national policies provided a regulatory seal of approval for “compensatory” mitigation activities aimed at wetlands being destroyed by development projects.

As conventional compensatory mitigation is undertaken for each individual project, there have been criticisms that it would lead to the scattering and fragmentation of natural land use. The mitigation bank system compensates for the impacts of more than one development project, including future ones, so that it makes compensation for the cumulative environmental impacts of development projects undertaken over time in an entire local area possible. It is also an economically-oriented technique, unlike conventional regulatory measures, and, because of this, is expected to grow further in the future, as it suits the American-style market economy, which leaves much of the decision-making process to the market mechanism.

Table 2 Evolution of Mitigation in United States

Phase	Period	Details
1. Pre-introduction phase	Up to mid 1960s	No environmental impact assessment system existed. The term “mitigation” started to be used with a connotation of preventing the declining of wildlife.
2. Introduction phase	From mid 1960s to mid 1970s	The concept of mitigation was included in environmental impact assessment systems, such as the one introduced with the NEPA. As a result, the term “mitigation” started to be used with a connotation of concrete measures to deal with the adverse impacts of developmental activities on the environment.
3. System and technique development phase	From mid 1970s to mid 1980s	A clear definition of mitigation consisting of avoidance, minimization, compensation, etc. was introduced. An amendment of the Clean Water Act Section 404 gave rise to a host of nature restoration and creation projects aimed at compensatory mitigation, with related regulatory frameworks and techniques developed.
4. Policy technique development phase	From mid 1980s to present	With the emergence of the mitigation bank system, mitigation has been evolving as an economically-oriented technique aimed at ensuring a balance between development and conservation in a given local area as a whole or in aggregate terms, which goes beyond mitigation for individual projects.

Note: The focus was on mitigation relating to the conservation of the natural environment.

4. Difference between Japan and United States and Effectiveness of EIA System

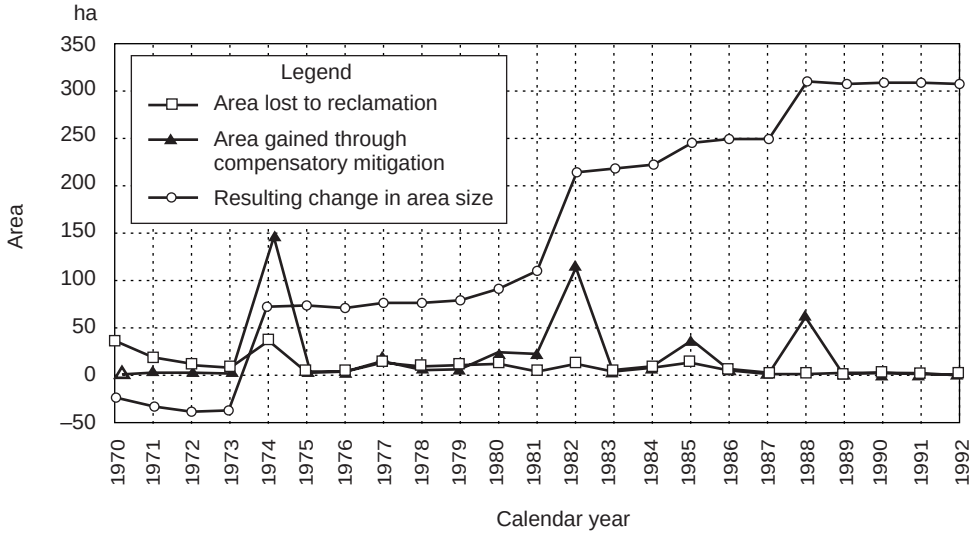
The difference between Japan and the United States as viewed from the standpoint of the effectiveness of the EIA system boils down to this: in Japan, no quantitative targets for nature conservation exist and clear provisions calling for the implementation of mitigation measures are lacking; as a result, emphasis is placed on an ascertainment of the "present state" of the environment, and mitigation measures for nature conservation are rarely undertaken.

To be more specific, let us consider an example of area-wide conservation in relation to natural land use in a local area. The Japanese EIA system is incapable of protecting the natural environment of the entire local area containing proposed development sites for the following two reasons: it focuses too much on impacts on the immediate neighborhoods of the development sites and there is no mandatory requirement to take measures to counter the destruction of nature in the development area itself; and impacts are assessed on the basis of individual projects, rather than the totality of developmental activities in the local area as a whole. Ironically enough, under Japan's EIA system, nature will keep diminishing in any local area, as long as development projects feature in it, regardless of how often or well EIA is undertaken (Tanaka, 1995b).

The author has had firsthand observation of the EIA of a riverside development project in California. As the project area involved a 6.5 ha community of *Sambucus mexicana* (Elderberry) which was the habitat of an endangered species called *Desmocerus californicus dimorphus* (Long-horned Beetle), the restoration of a riparian ecosystem measuring 44.5 ha, including a 19.5 ha *Sambucus mexicana* community, which was three times the size of the original community, through the purchase of farmland in the same river basin as the one in which the development area was located was ordered (Tanaka, 1995b).

To make up for the loss of wetlands that still remains after avoidance and minimization measures are taken, the compulsory restoration or creation of wetlands at least equal in size to those to be lost is usually required as compensatory mitigation in the United States. In Japan, EIA only involves minimization-type environmental conservation measures, with avoidance (cancellation of the whole or part of a project) and compensation not addressed at all.

Since around 1970, the combined area of the natural coasts along San Francisco Bay has been increasing. This is because the speed at which wetlands are restored or created through compensatory mitigation has been greater than that at which they are lost to reclamation activities. Fig. 2 shows the total reclamation area and total mitigation area along San Francisco Bay between 1970 and 1992. The cumulative change that has taken place between 1970 and 1992 represents a net gain of about 331 ha. Moreover, the total mileage of shoreline accessible to the general public along the bay, which had dropped down to about 6 km by the 1960s, increased to about 160 km (36% of the overall shoreline mileage of 442 km) by 1985 as a result of mitigation activities such as conversion into seaside parks (Environment Agency, 1990).



Source: San Francisco Bay Conservation and Development Commission 1992 Annual Report , p.3, “Summary of Permits, Fill and Mitigation”

Fig. 2 Changes in Area Size of Natural Coasts along San Francisco Bay (graphic representation by author)

In contrast, along Japan’s Tokyo Bay, 90% of natural coastline areas have already been reclaimed, with Banzu Tideland, Sanbanse Shallows, Sanmaisu Shallows and Futtsu Tideland being all that is left (Yamashita, 1993). To add insult to injury, development plans to fill them as well have already been drawn up. Of the overall shoreline mileage along Tokyo Bay, which stands at 882.1 km, the natural coastline accounts for 31.2 km (3.5% of total), with parks, artificial beaches, clamming beaches, etc. accounting for another 111.7 km (12.6%), bringing the total mileage of natural land use to 142.9 km (16.1%) (National Land Agency, 1993).

It is true that there are various factors behind this marked difference in the area size of natural coasts between San Francisco Bay and Tokyo Bay. These include differences in public opinion on environmental issues, the length of the history of nature protection activities, administrative organization structure/policy, city planning, and the relationship between the national and local governments, apart from a fundamental difference in the total territorial land area. However, the biggest direct factor in the difference in the development-related loss of nature between Japan and the United States is believed to be the difference in the EIA system and mitigation provisions.

Of the differences between Japanese and US conditions, the most frequently mentioned is land area. Because of the large available land area in the United States, people often say development activities in that country are undertaken in a careless manner. However, “such a preconception is mistaken. In the United States, detailed regulations designed to control the various

stages of developmental activities do exist, and project proponents must clear numerous hurdles in order to implement their plans" (Wakeford, 1990). At the forefront of these "detailed regulations" is the EIA system. The California Environmental Quality Act (CEQA) is particularly strict, to the extent that "no other state laws, including the Comprehensive Planning Act are believed to have had a greater impact on land use planning, despite the fact that this legislation (CEQA) is not strictly an urban planning law" (Fulton, 1991).

5. True State of Mitigation in Japan

A unique Japanese arrangement, which differs from the mitigation concept in EIA has recently emerged, and vigorous activities are being undertaken through this arrangement, amid growing public awareness of environmental conservation. Three examples that are useful in ascertaining the direction of the future evolution of the mitigation concept in Japan are shown below:

In 1993, Shimizu City, Shizuoka Prefecture, established the Shimizu City Ordinance on the Conservation of the Okitsu River. Against a background of extensive felling for the purpose of developing golf courses in the Okitsu River Basin, the ordinance introduced a system aimed at preventing a reduction in the water yield capacity of the river basin by making it mandatory for developers to plant trees to create forests which are at least equal in size to those lost as a result of golf course development. Although it has its limitations such as a lack of attention to ecosystems in terms of, for example, the types, structures and species compositions of forests, due to a single-minded focus on water yield capacity, this approach of seeking a balance over an entire river basin (watershed) is nevertheless epoch-making by Japanese standards.

In recent years, the reconstruction of natural ecosystem has started to be called "mitigation" in Japan. Examples include the reconstruction of biotopes and development of artificial tidelands, artificial beaches and sea-weed beds and near-natural embankments and water channels. These "mitigation" activities are often undertaken without a clear understanding of concepts such as "adverse impacts of development", "proposal of mitigation measures for the adverse impacts" and "impacts that still remain even after the proposed mitigation measures are implemented", thus obscuring the standards for success or failure. They also never go beyond technical arguments for individual cases, and lack the viewpoint of conserving the environment as a totality of ecosystems in the given local area. Nevertheless, such activities can still be considered as mitigation intended to address the cumulative total of past unspecified impacts, and there is a need for them to merge with local development plans with a perspective that covers the entire local area.

In April 1997, the Tokyo Metropolitan Government released “A Model for the New Environmental Consideration System in Tokyo Metropolis”. This is designed to introduce a new EIA system applicable in early stages of projects (Strategic Environmental Assessment, SEA), like the one established with the NEPA, while keeping the existing EIA system based on the existing environmental impact assessment ordinance as an EIA system applicable in later stages of projects (project assessment). This gives rise to the hope that mitigation will be given a clear-cut status through a requirement for the preparation of “an environmental consideration statement”. It is desirable that in future other local governments also bolster their mitigation provisions through the incorporation of substantial mitigation provisions into their traditional project assessment-style EIA system or introduction of a new SEA -style EIA system.

Mitigation under the Japanese EIA system, an illogical and back-to-front argument that “there will be no impacts on the environment as such-and-such environmental protection measures are to be taken” has become so widespread that, even in an environmental impact statement of several hundred pages, the discussion of “environmental protection measures” (mitigation measures) is often only several pages long, thus seriously undermining the effectiveness of the system.

6. Future Outlook of EIA System and Mitigation

To clarify the role of mitigation provisions in deciding the effectiveness of an EIA system, the evolution of EIA systems and mitigation provisions are summarized in Table 3. The development of EIA systems occurs in stages and the concept of mitigation changes from one stage to another. It is believed that the Japanese system is currently at stage “2”, while the US system is at somewhere between stages “3” and “4”.

“Mitigation” in nature conservation is equivalent to “linkage” in urban planning. Linkage is an urban planning system in which the implementation of solution measures to social problems that are likely to be created by development activities are made compulsory in exchange for permits for such activities (Fulton, 1991). A particularly well-known example is compulsory housing development to rectify a housing shortage created by a population increase resulting from urban development activities. The tightening of approval conditions for development through linkage has led to public opinion against granting approval for development projects driven purely by the pursuit of profits, which were traditionally commonplace. As a result, developers have started to incorporate the development of social infrastructure that is likely to be demanded during the approval process right from the beginning. This deterrence is the source of the effectiveness of the linkage system.

Table 3 Objectives of EIA System and Mitigation

Stage	Content and objectives of environmental impact assessment	Content of mitigation	Position of environmental impact assessment
1	Ascertainment of the status quo of the environment through environmental studies for specific projects in order to "exonerate" them	No substantial mitigation measures included	As environmental study tool ↕ As local planning or sustainable development tool
2	Minimum mitigation included in environmental impact studies for specific projects in order to "exonerate" them	Only "reduction" or "minimization" mitigation included (e.g. involving achievement of environmental quality standards)	
3	Achievement of "no net loss" regarding the environment of the entire local area with development projects, based on their aggregate impacts-in addition to the mitigation of environmental impacts of specific projects on an individual basis	Introduction of "compensatory" mitigation added to "minimization" mitigation	
4	Development plans incapable of achieving "no net loss" for the entire local area rooted out (zero option). All proposed development plans are coordinated so as to achieve "no net loss" collectively through appropriate mitigation measures. Achievement of sustainable development	Introduction of "avoidance" mitigation in addition to "compensatory" mitigation and "minimization" mitigation	

Similarly, the initial objective of mitigation was to oblige developers to take conservation measures for natural resources, such as wetlands, by making it an approval condition for development plans. However, the likelihood is that, as an EIA system and mitigation policy take root, mitigation conditions for development projects with a high risk of nature destruction will become stricter, and this will give rise to the formation of public opinion against granting approval for such projects, which were traditionally commonplace. Developers will then start incorporating mitigation measures likely to be demanded as an approval condition into their development plans right from the beginning.

In short, with both linkage in urban planning and mitigation in EIA, setting conditions/obligations for development projects and having the project proponents satisfy them is only the initial objective. The more fundamental goal is to root out development plans that do not incorporate mitigation measures, and to ensure that all development plans that are put forward for approval include mitigation measures right from the beginning. The driving force behind this will be the economic viability of the projects themselves and environmental ethics.

To bring about effective mitigation or linkage, it is necessary to fully specify the costs (negative impacts) of development plans to which mitigation or linkage requirements are to be applied. EIA is a technique designed to shed light on the costs and benefits of development projects (Ono and Abe-Evans, 1991). The US-style EIA system can be recognized as a tool to extract the information necessary to bring about effective mitigation or linkage.

Although this paper did not discuss community participation due to the limited space available, the development of mitigation measures is a process in which community participation is most desirable throughout the EIA procedure. In other words, there is little room for community participation with an EIA system that lacks a proper mitigation measure development process. To facilitate community participation, therefore, the formation of an adequate mitigation measure development process is essential.

An EIA system is the most powerful tool to realize democracy from the viewpoint of development and environmental conservation, and mitigation is the bottom line of EIA. To improve the effectiveness of the EIA system in the future, it is necessary to develop ordinances, guidelines and detailed implementation regulations that clearly specify mitigation policies in the objectives of the EIA system, project approval conditions and follow-ups.

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Summary

It is a quarter century after an EIA system was introduced in Japan. EIA seems to take root in the Japanese society. It has been, however, pointed out that the validity of Japanese EIA as a tool of environmental conservation is relatively law.

The goal of this paper is to consider ideal mitigation regulations in the EIA systems to achieve higher validity of the EIA systems.

The paper cleared that the low validity of Japanese EIA depended on lacking or unclearness of “mitigation” regulations in the EIA systems. Changes of “mitigation” regulations which were described in the texts for definitions an/or purpose of EIA systems from the first national EIA guidelines in 1972 to the latest the EIA law in 1997 were analyzed. The quarter century was roughly divided into three stages. These are “the introduction stage” (early 1970s). “the formation stage” (later 1970s to 1980s), and “the present stage” (1990s).

The National EIA law was finally enacted in 1997 and “mitigation” regulation has been clearer compared to before. It is very important to establish both national mitigation policy including priorities of mitigation actions such as 1: avoid; 2: minimize; 3: compensate, and substantial mitigation guidelines for better implementation of EIAs as soon as possible.

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