

Review

Taking/Compensations or Regulations? Balancing Landscape Conservation and the Development of Renewable Energy Facilities in Japan

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Abstract: The application of regulations for the development of renewable energy facilities is one of the key environmental conservation strategies being implemented in Japan. However, regulations are only applied if the degree of environmental degradation falls below the “reference point.” Thus, impacts of project development that are remarkably limited to scenic values of landscapes are largely overseen in Japan. On the other hand, establishing standards for the “reference point” is challenging, and existing scientific approaches and legal frameworks for conserving “daily landscapes” are largely absent. Therefore, it is necessary to establish a set of standards for “reference points” or indicators to classify landscape inventories, particularly those with scenic values. This study explored the potential of development-compensated implementation in Japan by scrutinizing relevant compensation measures in other countries. The results revealed that adding the aesthetic degradation of landscapes as an object in development compensation is challenging, as its value is difficult to monetize. Further, the evaluation of landscape degradation may be insufficient. Hence, there is a need for objective-driven indicators and methods that measure landscape degradation, particularly the effect of renewable energy facilities on the scenic values of “daily landscapes.”



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1. Introduction

Issues surrounding development persist in developed and developing countries despite continued discussions since the Brundtland report and other historical documents [1–3]. The most contested cases in contemporary developed countries include the installation of renewable energy facilities and natural resource management, such as forestry management and related regulations (i.e., tree thinning), as countermeasures against global warming [4–7]. These development activities are often accompanied by environmental changes, frequently in the form of trade-offs between environmental functions and social conflicts, altering the hydrology, biodiversity, culture, and/or landscape of the region in installation sites [8]. Moreover, there are trade-offs between social and institutional dimensions and among different stakeholders involved, which are often driven by research questions such as “Who pays for such conservation costs?”; “Who is exempted from paying conservation costs?”; and “Who will be responsible for environmental conservation?” [9–13]. These questions are particularly challenging in landscape conservation contexts, in which various stakeholders are involved. One way forward in addressing these concerns is through scientific and objective investigations.

Existing science-based methods consider the cost and benefit-sharing of landscape conservation, such as the impact assessment of scenic resources, aiming to objectively evaluate them and measure the degree of landscape degradation in question. Certain methods are currently being implemented in the UK and the US, such as the Landscape Character Assessment in the UK that aims to identify and describe variations in landscape characteristics [14]. In the US, when wind power is generated, developers or business

operators are required to enter into a Host Community Agreement to return profits to the region [15]. Similar requests have been implemented in Japan; when business operators abandon development, there is no benefit or return from the region, and they will be forced to conserve landscapes free of charge for the region. These efforts to eliminate imbalances are globally sought after as climate change countermeasures and landscape conservation measures. The legal framework of Japan addresses such discrepancies. For instance, the “Economic Measures to Prevent Hindrances to Environmental Conservation” of the Basic Act on the Environment (*Kankyo-Kihon-Ho*, Act No 91 of 1993) states, in theory, that it is possible to introduce “economic instruments that differ from traditional regulatory instruments as an instrument of environmental policies” [16]. The law further encompasses the possibility of developing effective policies for environmental issues that are difficult to address with conventional regulatory approaches [17].

Economic instruments can be applied in multiple ways. For instance, business operators need to respect the so-called “landscape profits” or *Keikan Rieki*, where local communities contribute to constructing and maintaining landscapes [18]. The legal framework of Japan shows “in return for ‘compensation’ (*Hosyoh*) for landscape conservation, compensation from the public sector must be paid for business operators to abandon development, because of considering the regional consensus of the community despite the legal possibility of development. [19]” Since this concept is not practically connected, business entities are not recognized for the economic benefit or honor of withdrawing from the business for the sake of landscape conservation, so as a result, they hope that the land they own will be managed as efficiently as possible as a business. As a result, the public sector must use taxes at the national or prefectural level burden on residents to conserve the landscape.

In Japan, there are two types of “compensation.” The first type is the idea of expropriating development rights from business operators (i.e., taking) rather than paying compensation (*Kaihatsu-Hosyoh*), and the second type is the government funds for business entities’ development projects that are harmonized with landscape and biodiversity conservation [20]. For the former, monetary compensations are provided to business operators or developers for lost opportunities from abandoned business plans. For the latter, monetary compensations are paid by the government to operators to abandon their planned development as a conservation effort. To avoid confusion, in this manuscript, both types are referred to as “compensation”; however, this study deals with the former type.

In Japan, if the environmental standard of the current situation is maintained as is, that is, if it is not developed, it tends to be regarded as a regulation (in this case, compensations are not required). There are similarities with other countries, especially developed countries that are faced with declining birthrates and aging populations [21] or uneven distributions of the population [22]. It is instrumental to compare regulations in different contexts. Thus, this study inspected the regulations and legal frameworks of Japan and the existing approaches in the UK and the US. Section 2 presents the case of Japan, focusing on the boundary between private goods and public interests. Japan has the strongest landowner’s (private individuals) rights among the developed countries with a compensation system, whereas the public sector has weak regulatory tools and specific laws including effective environmental conservation [23]. Section 3 overviews specific legal instruments that objectively address landscape degradations in the US and the UK, and Section 4 examines whether they can be applied in Japanese contexts or current legal frameworks. If the application for Japan can be demonstrated, these instruments could also be utilized in other countries with similar settings. Finally, Section 5 summarizes the key findings and emphasizes the need for inventories and indicators for scenic impact assessment.

2. Boundary between Private Goods and Public Interests

2.1. Research Overview

The relationship between personal property rights and environmental protection is an issue that has long been debated. Lubens clarified the relationship between so-

cial restrictions and property rights in German and US laws, indicating that property rights are the core part of the surrounding areas [24]. The study found that German law has a constitutionally guaranteed sphere of rights that exists as a “core field” (the *Kernbereich*), whereas U.S. law has the Taking Clause in the Fifth Amendment of the US Constitution [25] to protect the economic value and expectations related to realizing value in a property object.

The US Taking Law is underpinned by several common law judgments, and much debate surrounds this law. Essentially, expropriation of land ownership (land expropriation) is taking; however, it must be distinguished from other property rights regulations (property regulation by state police power with no compensation). Many property law researchers have investigated the Supreme Court case regarding taking [26] and explored the inherent quality of private property rights and public expropriation rights from their historical transition.

Findley and Farber [27] discussed the 1978 US supreme court judgment *Penn Cent. Transp. Co. v. New York City*. Moreover, there have been discussions on how to bring public interest to private land. The present study utilized Alexander’s Social Obligation theory [28]. This theory is based on the analysis of ‘taking’, and the affirmative obligation of the property owner to the local community. He uses the “capability approach” proposed by Nussbaum and Sen to examine the community base and “functioning” of land. Penalver [29] and Wendel [30] defended this, while Smith [31] criticized it. Conversely, although not aggressively addressed in this study, Rule stated that if landowners are to be obliged to protect the natural environment, it is not a legal liability but an individual “norm” [32].

In Japan, if the current environmental standard is maintained (i.e., selected not to be developed), it tends to be regarded as a regulation (in this case, compensations are not required). While the current Japanese law has these characteristics, some similarities are shared with other countries (especially developed countries) that are faced with declining birthrates and aging populations [19] or uneven distributions of the population [20]. It is instrumental to compare regulations in different contexts and to estimate the agreement contents to obtain regional consensus.

Figure 1 shows the situation that this study aims to clarify and address. Currently, in Japan, the parties involved in the legal procedures of renewable energy projects include ‘the Power Generation Business Operators/Developers’, ‘Public Sector: Ministry of Economy, Trade and Industry (METI) and Municipality’, and ‘Local Residents’. The Public Sector is where business operators apply for a business license and seek judgement. Local Residents represent the local environmental conservation spokespersons. The relationship and legal proceedings among these parties are unclear, and the issues on compensation and landscape assessment remain indefinite in the issuance of a business license by the Public Sector. For instance, when business operators apply for a license, the public sector examines the required documents based on the permit criteria and decides whether to grant a license or deny the application. If the permission criteria are appropriate and clear, the public sector can easily function as a regulation on the issuance of a business license. However, if the criteria are inappropriate and unclear, the decision of whether to approve or deny the application will be difficult. In such cases, regional consensus or agreement between local residents and operators is considered, as residents’ intentions have a strong influence on the public sector’s decision [33,34]. Particularly, if there is a strong opposition movement from local residents on the proposed renewable energy project, the public sector is likely to reject the license request. If such cases arise, regional consensus with the locals and municipality is achieved through the provision of benefits to the proposed project site. This includes compensation for environmental degradation and consideration for the economic value of landscape benefits, which are difficult to monetize.

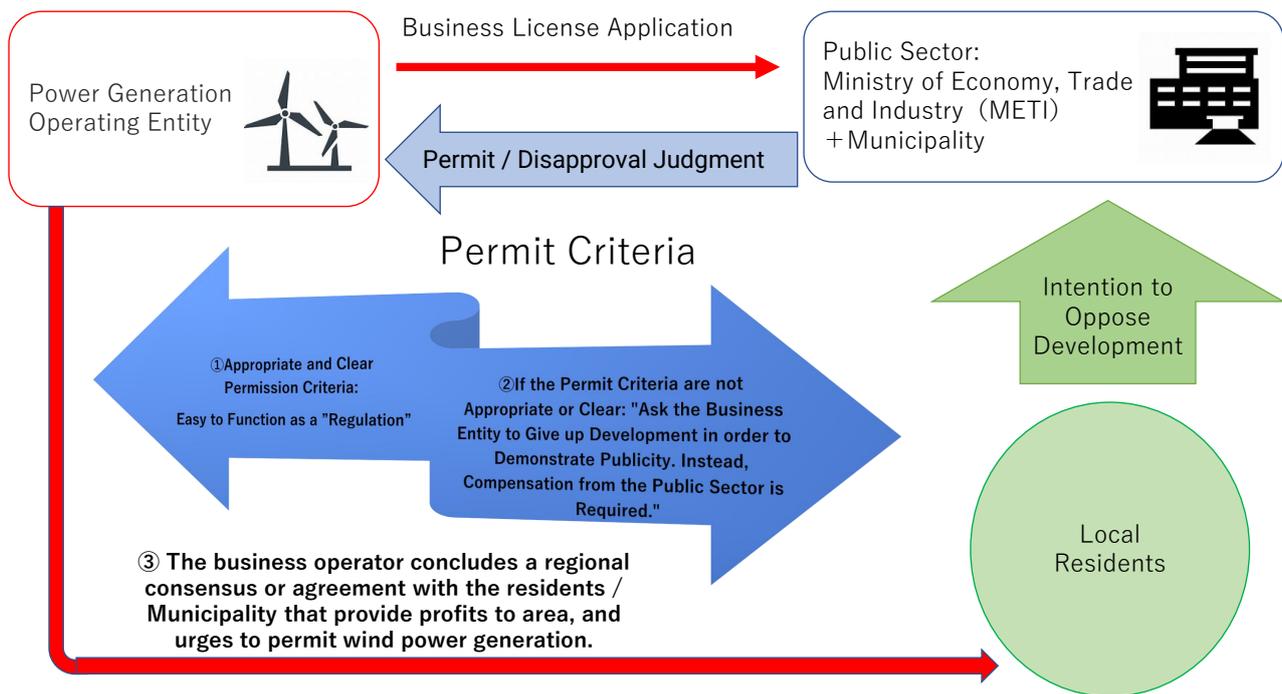


Figure 1. Parties involved in the issuance of business licenses for renewable energy projects in Japan.

As such, if the permit criteria are not clearly determined, it is not possible to provide compensation for businesses that abandon development and stop environmental deterioration and benefits provided to the region instead of developing and causing environmental deterioration. To achieve these points, it is necessary to have a clear indicator for converting the amount of damage caused by environmental deterioration.

Landscape deterioration is the primary reason for local residents' opposition to Japan's renewable energy power generation [35]. In promoting offshore wind power, Choshi offshore in Chiba Prefecture was selected as the only Renewable Energy Promotion Area (*Sokushin-Kuiki*) in the Kanto region [36]. Offshore Promotion Areas are designated by the government based on the act that establishes unified rules for offshore wind power generation (Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities (Shortened form: *Saiene-Kaiiki-Riyo-Ho*, Act No 89 of 2018)) after coordinating with the preceding users of the sea area, such as fishermen, and with the region. Choshi City is a fishing town; however, fishing yields have been declining. The promotion of this project had issues with compensating fishermen and handling the deterioration of the landscape, as this location has a scenic bay (*Byobugaura*) and a view of Mt. Fuji in the distance. Therefore, the landscape would change drastically if more than 30 wind turbines were constructed [37]. Consequently, fishermen received compensation, and Mitsubishi Corporation, which was selected as a business entity to promote offshore wind power generation, was asked to give "maximum consideration" to the local community [38]. The expression "maximum consideration" shows the lack of options for the modern landscape conservation criteria.

Therefore, if business entities can receive compensation for loss if they are prevented from development, it will be possible to prevent damage to the landscape to some extent. As such, I believe that clear standards (indicators) are necessary for everyday landscape conservation. Therefore, this study aimed to demonstrate the importance of indicator formulation and its continuous monitoring based on the cases of the UK and the US.

2.2. Internal and External Legal Obligations

Article 29 para 1 of the Constitution of Japan defines the property right as "the right to own or to hold property is inviolable" [39]. In para 2 of the same article, "property

rights shall be defined by law, in conformity with the public welfare” and the exercise of property is accompanied by “internal legal obligations” [39]. Furthermore, para 3 stipulates that “private property may be taken for public use upon just compensation therefor,” and “compensation (*Hosyho*)” are required legally [38]. In more concrete terms, para 2 indicates that property rights are restricted (subject to intrinsic restrictions) by law. In this regard, no compensation is required. Conversely, para 3 states that to achieve the public purpose, the state power may coercively expropriate or restrict the use of private property based on the French Declaration of Human Rights. In such cases, legitimate compensation is required (Figure 2) [40,41].

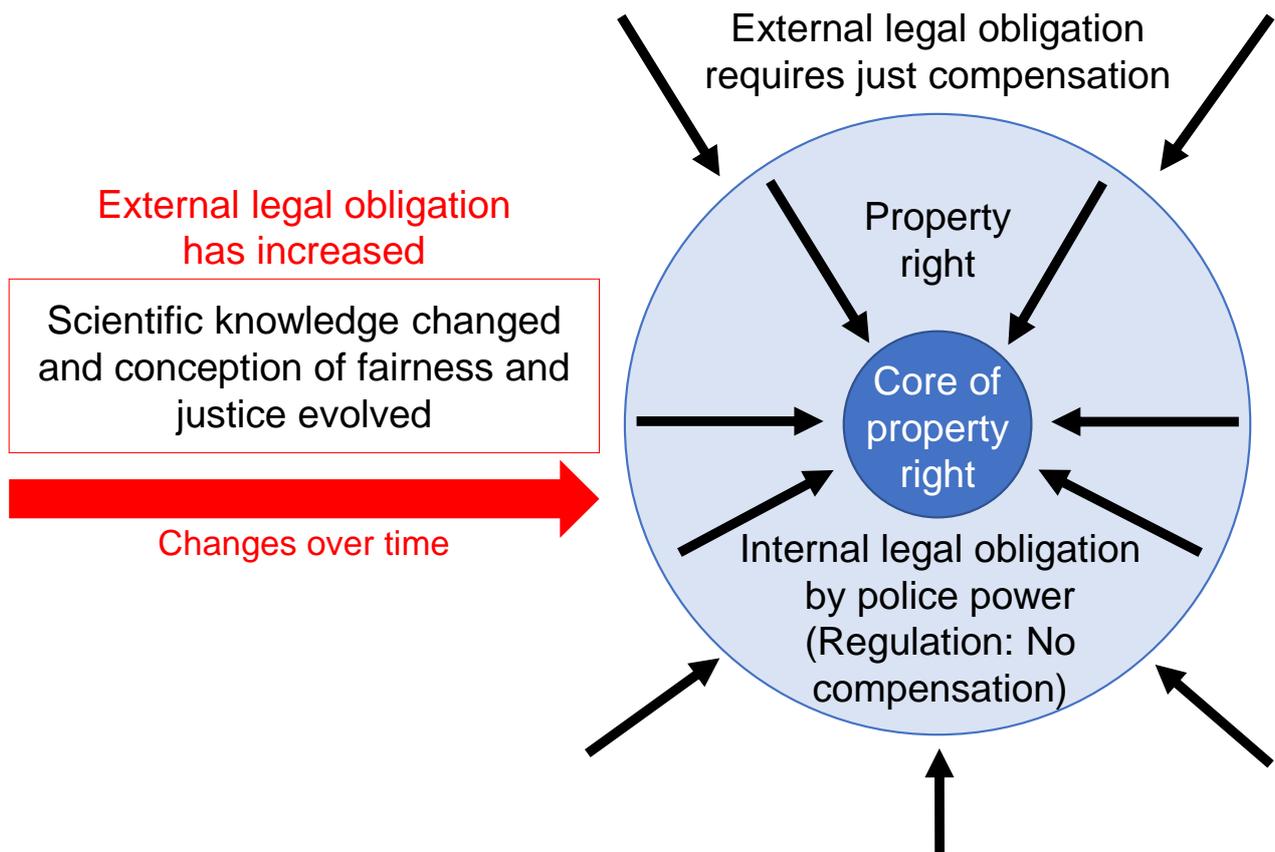


Figure 2. Internal and external legal obligations observed in Japan.

The restrictions outlined in para 2 are implicit and are subject to regulation by “police power.” Police power means a fundamental power essential to government, and the inherent and plenary power of a sovereign to make all laws necessary without compensation (Figure 2). It is the “noxious-use doctrine” (*sic utere tuo: to do this without harming others to use their things*) and it is found in the realm of the provision of public goods, such as essential fields for human survival, including life, public health, national defense, law enforcement, and fire protection. This doctrine has gradually been applied to situations where public utility is expected by society, with no significant foreseen negative impacts. These are general norms of the regulation [31].

Alternatively, “taking” (public expropriation, regulated in para 3 of Article 29) aims at public use and does not take private property without appropriate compensation [39]. The “taking” clause is not a source of power for taking but rather a limitation [42]. For instance, “taking” must be for a public purpose, and compensation must be made because it entails special sacrifices for the benefit of the public. In addition, “taking” includes governmental or official actions that damage property or impair its use and physical appropriations [43].

2.3. Prioritizing Compensated Measures over Regulatory Actions

In the US, using “funding” measures for the conservation of endangered species was more effective than regulatory actions [44]. These “funding” measures are provided for land use rules, such as abandoning developments for the conservation of endangered species inhabiting private land [45]. Such trends can be applied in the context of landscape conservation as well. This study interpreted the term “funding” as synonymous with “compensation.”

There are no existing criteria or legal protections for landscape degradation outside of national parks or designated areas in Japan. Moreover, one of the most frequent and opposing opinions of the local residents regarding renewable energy facility construction is the deterioration of “daily landscapes” (landscapes in daily settings without specific legal protections), making the issue a recurring problem in Japan from 2017 to 2020 [35]. Given the absence of legal frameworks and established criteria, the general trend of conflicts is on the rise, and issues surrounding landscape problems tend to rely on “residents’ consent.” This is because the construction activities of business operators are neither illegal nor unreasonable and frequently occur in unregulated sites, such as those that lack landscape protection. Moreover, target project sites are often perceived by people as “familiar” or “daily landscapes” in the region, and there are concerns that they will be affected or changed. For instance, a change in the landscape by cutting trees reminds residents of disasters such as floods that were once affected. Such “landscape change” is sensitive and affects the liberty of other economic activities, such as tourism in mountainous areas with strong historical and religious elements and idyllic hot spring areas with legitimate procedures. There is a need for objective-driven criteria to have a balanced system.

In the absence of clear regulations, it is imperative that residents provide sufficient compensation for business entities rather than forcing “residents’ consent” by regulations or municipality ordinances to make business developers consider landscape elements. When there are signs that regulations will be imposed or when there is a small amount of compensation, business operators can develop the project legally [44]. Alternatively, if compensation is sufficient, development can be stopped and/or reexamined. In many development cases, local people want to protect familiar landscapes that affect their daily lives. The introduction of a “compensation” measure should be considered for the conservation of landscapes and historical and cultural heritage, which are not legally regulated.

2.4. Is it Taking or Regulation?

This study compiled descriptions from various sources that have changed along with the social and legal circumstances. Yoshida [46,47] noted that unlike “restrictions to avoid negative externalities (intrinsic restrictions),” there is an increasing number of “restrictions to ensure positive externalities (extrinsic restrictions)” based on certain real estate uses, such as conservation of green spaces and conservation of landscapes. This overseas restriction falls under Article 29 para 3 and requires compensation [38]. Sax [48] stated that “drawing the private/public line is not limited to physical harms.” Furthermore, the balance between private desires and public obligations in the rules governing land ownership states may change over a longer period. Specifically, the development of scientific knowledge on hazards and concepts of fairness and justice affect such changes, which may include the possibility of both internal and external legal obligations. The full burden of maintaining that value falls on the relatively few who retained some natural value in their land, whereas those who have created the problem of potential species extinction bear no burden at all [48]. Alexander [28] argued that the owner should have active security obligation, in addition to “negative obligations” under “noxious-use doctrine.” This idea is that landowners should be obliged not only to passively “not develop (prohibit)” but also actively “conserve (affirmative obligation).” This is a useful suggestion at present, when it is scientifically revealed that “care” is required in certain cases, in addition to “avoiding development” for environmental conservation.

It is difficult to determine whether the public nature of the government is “taking” (requiring payment of just compensation) or a regulation (with no requirements for compensation). There is no clear line or “standard” that can be distinguished [41,43,49,50]. This is partially due to changes over time, including scientific progress, and changes in the sense of equity and justice. In contrast to the compensation requirements overseas (as described later), the range of regulations is kept wide, as long as the content of the regulations is conserved in current Japanese laws [51]. For instance, under the Natural Parks Act Article 17 para 3 [52], a claim for compensation for loss was excluded, as the restriction on the use of the application for permission for the new construction of structures was an inherent restriction of property rights [53,54]. Another example is the case of local government-zoned green belts around urban areas. These include zoning that regulates the development of lands designated as green belts by landowners; however, litigation disputes that development indemnity would be sought in that regard. However, the Japanese Supreme Court determined that compensation was not required if conservation was forced [55]. Alternatively, if landowners’ existing buildings are to be destroyed to install green belts, compensation is deemed necessary [51]. This means that not all landowners who currently have a natural environment to preserve are responsible for conserving the natural environment [48]. It is an academic doctrine and precedent that compensation for the loss under the Japanese Law enables the right to claim damages under the Constitution directly, even if there is no specific provision in the Individual Law [56].

In addition, it is difficult to consider the criteria for distinguishing between “taking” and regulation. There arises the need for scientific or agreed objective-driven criteria of landscape degradation for proper compensation. The amount of compensation does not indicate that development activities will be easier or unmonitored; rather, it promotes prudent and responsible development. To demonstrate this, under the US Endangered Species Act, payment of development compensation (“compensation for development control”) rather than imposing regulation on endangered species has led to more controlled development activities [44]. Furthermore, the concept of development compensation is presented as a responsibility (indemnity) for local communities seeking responsibility from business operators.

There is a high demand that landowners assume the duty of conservation if they can play the role of conservation, as the number of actors in conservation is decreasing [28]. If the landowners are considered primarily responsible for conservation, it may be necessary to compensate the landowners for the additional efforts to conserve (which are higher standards than “not developing”) [48]. Landowners may have the right to choose their preferences for conservation measures; however, for them to exercise their rights, a systematic operation, such as “ecological succession of cultivated land to wilderness area” over the long term, is required [57,58].

3. Criteria and Quantitative Approaches to Landscape Degradation

Existing compensation schemes in the UK and the US include measures to balance landscape conservation with developments including land-use changes. In addition, this study examined the legal settings related to ownership (private and public lands) in the two countries. In the current compensation schemes, both countries have a common context that “all property has a legally recognized owner, and if the owner cannot be found in a timely manner, then the government is presumed to be the owner” [59,60]. The landowners and the public sectors are responsible for maintaining the environment including landscapes.

The landscape character assessment (LCA), which is a process of identifying and describing variation in landscape characteristics, is used in the UK to evaluate the “visual despoliation of valued landscape” [14]. LCA documents identify and explain the unique combination of elements and features that make landscapes distinctive by mapping and describing character types and areas [61]. In addition, they show how the landscape is perceived, experienced, and valued by people [60]. Moreover, in the LCA approach, the landscape is evaluated whether it has “use value” or “non-use value” when wind turbines

are installed or not [62,63]. It is logically deduced from “options to visit landscapes without wind turbines,” “options to visit a landscape free of wind turbines,” or simply “the presence of untouched landscapes” (that a “pristine” landscape exists as the “non-use value”).

In many areas, wind farm development is located without protection areas, but close to these designations. Though, in these circumstances, the effects on the designated landscape remain a key consideration, LCAs do not place value on one landscape type over another. LCAs may point to the reasons why a landscape might be valued. LCA helps us understand what the landscape is like today, how it came to be like that and how it may change in the future. It also helps to ensure that change does not undermine whatever is valued or the characteristics of a particular landscape, and proposes ways to improve the landscape’s character [63].

Looking at a specific case, the LCA methodology has proven beneficial for the Cape Wind Energy (CWE) and Ocotillo Wind Energy Facility (OWEF) projects in Scotland [64]. The LCA explained that “visual degradation” can be identified as a negative externality that may potentially affect human well-being and a realistic cost that needs to be considered in determining the economic viability of the project.

In the US, visual resource management (VRM) manages public lands in a manner that protects the quality of visual or scenic values. VRM is conducted under the Federal Land Policy and Management Act (FLPMA) by the Bureau of Land Management (BLM). The BLM has developed the VRM system for visual resource inventory, management, and impact assessment. BLM-administered lands are managed in accordance with approved resource management plans, which are developed with public participation and collaboration. The VRM classes set the objectives for lands in each class and describe the limits of allowable visual change in the landscape character with which proposed management activities must comply [65].

VRM is a methodical approach used for cataloging and managing scenic resources of public lands managed by the BLM. Specifically, all public lands managed by the BLM are classified into four categories based on the maintenance of natural landscapes (Class I), scenic quality (Class II), sensitivity level (Class III), and distance (Class IV). This classification has an impact on business approvals. In VRM classification, considerations are sought before undertaking development activities in the region and provide a methodical means to evaluate activities that they conformed with the approved objectives. There is a unique scale of landscape evaluation.

4. Potential of Development Compensation in the Legal Framework of Japan

Current Japanese regulations of environmental conservation are generally required only if they are below a “reference point” (a benchmark of being “neutral”). In Article 21 of the Japanese Basic Act on the Environment (Regulations to Prevent Hindrances to Environmental Conservation), regulatory methods are stipulated as “the State must take the following regulatory measures to prevent a hindrance to environmental conservation.” The conceptual framework is outlined in Figure 3 [52,66]. For Case 1, development activities are above the reference point and have desirable effects on the environment. For Case 2, environmental conditions are deteriorating but are still above the reference point. In this case, regulation is not yet necessary, although the validity of the content is questioned, such as “Is the business operator taking and evading compensation payments?” Moreover, “soft methods” are desirable as incentive measures, awareness-raising, or educational activities. In contrast, in Case 3, the environmental conditions are below the reference point; thus, environmental conservation control measures are needed to avoid degradation. These public measures are implemented in the form of regulations.

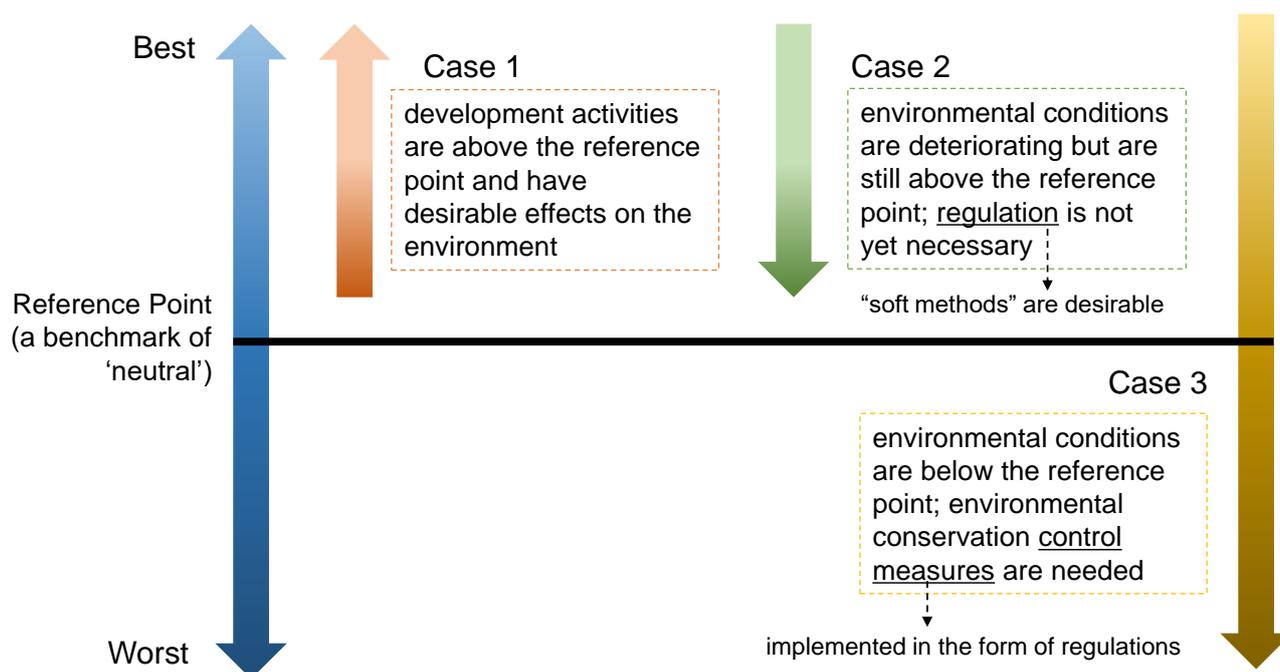


Figure 3. Conceptual framework of implementing Japanese regulations for environmental degradation control measures (conceptualized from MoE 2002).

Article 2 of the Japanese Basic Act on the Environment defined “environmental load” that leads to a worsening of environmental conditions as “negative effects of human activities on the environment causing hindrances to the environmental conservation.” “Hindrances to environmental conservation” means environmental degradation to the extent that measures directly related to the rights and obligations of citizens, such as regulations, are implemented. Examples include damage to human health and living environments, such as pollution and failure to secure natural blessings that are indispensable for the public. Despite this regulation, Japan is facing the concern of deteriorating ecosystems and landscapes caused by inaction, such as the lack of care for artificial forests and the neglect of *satoyama* [21,67]. It is difficult for landowners to be legally liable for inaction, as they have the freedom to leave (or use) the land [21] and, in certain cases, due to cultural differences affecting people’s perceptions and behavior [68]. In several cases, inactions can be “hindrances to the environmental conservation,” as conservation activities in degraded ecosystems are an extra burden for the landowners [54].

In addition to the above regulation, there are also specific landscape-related measures. For instance, in Article 2 of the Landscape Act, the “good natural landscape” (*Ryoko-na-Kekan*) needs to be protected and is described as a “Basic Philosophy” [69]. Other measures regarding natural landscapes include Article 1 of the Natural Parks Act for excellent natural scenic areas [52] and Article 2 (5) of the Act on Protection of Cultural Properties for the cultural landscape (*Bunkateki-Kekan*) [70]. Although these measures for “good landscape” need to be followed and regulated, there are no specific indicators of landscape degradation or reference point indicators. Furthermore, the Japanese legal environmental assessment includes a procedure called “post-hoc investigations” (*Jigo-Cyōosa*), which are surveys conducted after the commencement of projects [71]. Business operators must consider the implementation of the follow-up survey in certain cases, and if the results show that the environmental impact is significant, they must take environmental conservation measures. This follow-up survey avoids environmental impact caused by unpredictable factors and prevents problems with local residents; however, investigations related to landscapes are lacking compared with surveys related to animals or noise which are steadily conducted [72]. The measurement and monitoring of such landscapes, including

the development and operation of negative indicators of landscape degradation, are not regularly conducted, if not absent, despite efforts made to conserve “good landscapes.”

If certain landscapes considered for development can be ranked or categorized, the degree of damage to the landscape should also be classified. The idea of subtracting from the condition without the damage is effective for the classification. There are three reasons to support approaches of quantifications for Japan (as in the UK’s LCA and the US’s VRM). First, the method can be applied to the degree of damage to natural landscapes in daily settings in addition to the current “good natural landscape,” such as scenic places, which are the focus of current environmental impact assessments. The indicators further lead to the calculation of development compensation more proportionally, as they contribute to balancing the pros and cons with objective criteria reflecting arguments for developments and conservations by continuously accumulating and utilizing data in monitoring.

Second, such scenic resource indicators can be applied to areas or landscapes that are not yet protected by law. Before the enactment of the Landscape Act, there were landscape ordinances in some advanced municipalities [69]. In other words, the idea of these landscape ordinances becomes a policy at the national level, and what is further cultivated is called the Landscape Act. Some of the ideas of conserving the natural landscapes of various places that exist in municipalities have been inherited by the Landscape Act [73]. However, due to its national disposition (nationwide), the methods prepared by the Landscape Act are not intended to conserve local daily popular landscapes or popular natural landscapes. The trade-offs and conflicts are likely to intensify with the revisions of the renewable energy schemes, and deregulation of law-based environmental impact assessment standards. In Japan, each municipality is making policy decisions on renewable energy promotion areas [74]. The area can be classified into one of three categories: development promotion area, adjustment area, and excluded development area (Figure 4). The significance of the classification is progressing in Japan as the number of conflicts occurring in various places is increasing [75–77]. Examples of these conflicts are cases with opposition movements, even if the developments are neither illegal nor unreasonable (Figure 4) [57]. Such conflicts are likely to linger when the development promotion and adjustment areas are introduced based on legal procedures. There is a need to consider scenic resource indicators in advance and examine land-use policies and other development plans for the introduction of renewable energy. Furthermore, “residents’ consent” tends to fall into subjective judgment; when consents or agreements tend to be difficult, they tend to eliminate the problem itself.

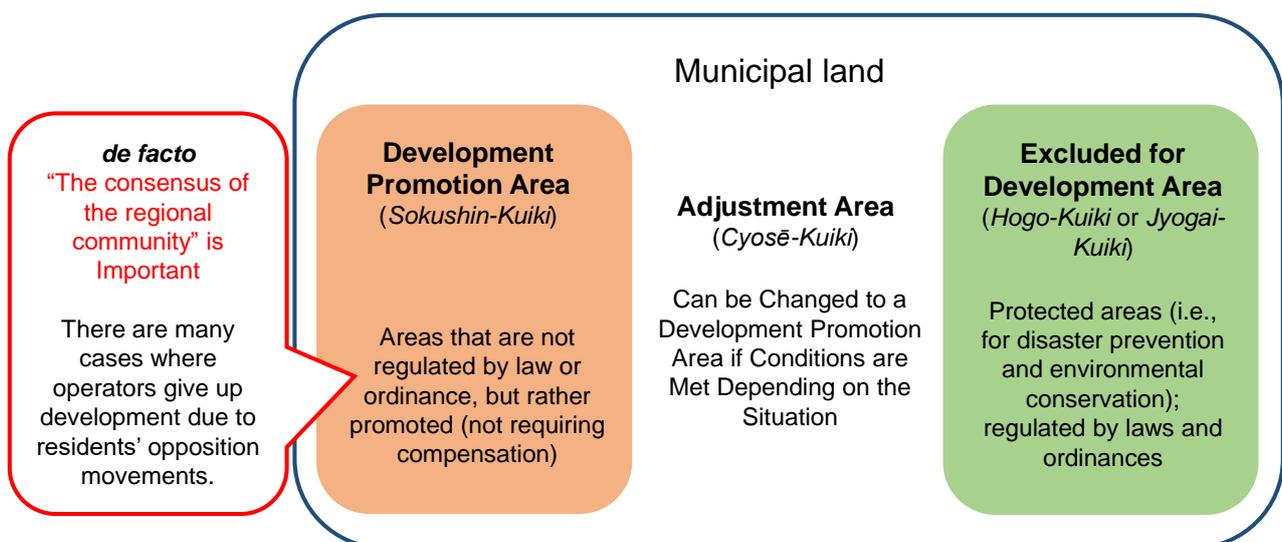


Figure 4. Current status of promoting areas for renewable energy sites in Japan (modified from Kohsaka and Kohyama 2022).

The third reason to support approaches of quantifications in Japan is the sense of aesthetics, which may change over time. An iconic example is the Eiffel Tower in the city of Paris. Initially, the tower was perceived as “out of place”; however, it is currently the most famous and beloved symbol in Paris [78,79]. In Japan, the Tokyo Metropolitan Government Office received negative perceptions in the earlier periods; however, over time, it changed to positive and consequently became one of Tokyo’s landmarks. The evaluation of aesthetic values is possible by adding the damage of the development to the condition in which such transition was not damaged. For instance, if wind turbines are perceived as beautiful with the transition to the next generations, they can be evaluated as having positive effects in the longer term.

As another aesthetic, we have also noticed the existence of ethical aesthetics. We must pay attention to changes in public nature in an era when climate change countermeasures are required more and more. Renewable energy business entities tend to be treated as private businesses (not public nature) under Japanese law [80]. Therefore, when a business entity gives up its business to preserve the environment and landscape, it can be regarded as a withdrawal of a public nature. In this case, the beneficiaries are residents, etc. However, it is necessary to consider “whether the renewable energy business really does not have a public nature”. This is because the role of the renewable energy business as a countermeasure against climate change and the provision of services in society in the form of electricity supply is truly important. However, the question here is ‘the location’. Even if it is a project for such an important business, whether the project should be implemented in “this place” is being questioned again.

5. Conclusions

This study examined various approaches to scenic impact assessment. In the UK and US, the degree of damage to the natural environment is foreseen and evaluated, and such methodologies are instrumental in decision-making processes. Moreover, by applying necessary assessment, it is possible to measure or estimate who (including individuals and communities) and where will be affected, including benefits and adverse effects. This enables a better understanding of both positive and negative effects at the landscape level, allowing the decision regarding which level of effects the development is likely to result in. Based on these findings, classification allows the owners who are only developing to compensate residents as an offset for development. Items of scenic impact assessment are de jure mandatory issues but are de facto limited parts of the environmental impact assessment (EIA) when considering the effects of landscape degradation from development projects.

The ways to address landscape impacts in EIA, the impacts of community concerns on the consensus of the regional community, and the degradation of natural landscapes in large-scale wind power projects are increasing. Local residents are frequently concerned with wind turbines and facilities constructed at the ridges of mountains, which are separated from human living spaces. These concerns arise from the projected “changing living environment (hometown)” to the change of the distant natural landscape rather than the risk of biodiversity damage (including migratory birds) or health-related noise risks. In such cases, concerns regarding landscape deterioration are interlinked with concerns about disasters, including land modifications [81]. Thus, there is a need to develop compensation for the cost and benefit-sharing of landscape conservation. To balance landscape degradation with other functions and preferences of residents, there is a need to develop indicators for the calculation, concrete scenic resource inventory, and establishment of a methodical approach to management.

Existing methods were examined to balance landscape conservation with the increased construction of renewable energy facilities. This study outlined several aspects as a way forward. There is a need to encompass and evaluate landscapes in daily settings beyond those “good natural landscapes” in scenic places. With the increasing of conflicts, it is essential to evaluate and rank or categorize landscape resources for all landscapes. As

such, methodical efforts are required to conserve areas beyond “good natural landscapes,” including those in daily settings of rural areas, which are largely overseen and neglected.

Furthermore, there is a need for objective-driven approaches that can measure landscape degradation. It is relatively easy to evaluate the beauty of the landscape that needs to be protected; however, there are no established methods from various perspectives or social contexts. Adding landscape’s aesthetic degradation as an object in development compensation is challenging, as its value is difficult to monetize, and it may not be possible to sufficiently conduct research such as aging evaluation regarding landscape degradation. As a methodical approach to advance landscape conservation, examinations balancing development projects are required.

The significance of this paper is that, for a country like Japan, which does not have clear, objective-driven indicators and methods that measure landscape degradation, it is important to establish scientific indicators and the sharing of responsibility for their development (to provide an opportunity to think about the relationship between developers and victims, potential victims and beneficiaries) including the importance of compensation.

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