Seeking Prevention of Continuous Biodiversity Degradation: An Economic Analysis of Law Approach

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Abstract. Biodiversity degradation continues; IUCN announced that 28% of the biodiversity is in the endangered category until today, despite many programs and policies to prevent it. This is a big concern for the world because biodiversity is the main support for life on earth. Therefore, the no net loss' of biodiversity movement needs to be pursued optimally. One possible effective approach is to use the principles of Economic Analysis of Law (EAL) as a basic principle for preventing biodiversity degradation. Using normative juridical methods, and using a literature study approach in the form of literature review and qualitative juridical analysis, the research results show that EAL can be applied as a tool to prevent biodiversity degradation by combining the principles of efficiency with compensation. The form of EAL implementation is in the 2 (two) incentives: financial and non-financial. Financial incentives in the form of tax exemptions for the use of technology, land use, and other forms of business that have an impact on biodiversity protection, efficiency in harvesting techniques, training people in process skills or investigation of new products and technologies that have an impact on reducing biodiversity degradation, community benefit-sharing, and the most challenging is to invite the private sector and community to invest in biodiversity. On the other hand, the non-financial incentive group in the form of biodiversity management; access and rights to use biodiversity; subsidies for biodiversity conservation activities, including the implementation of corporate social responsibility in company activities that have an impact on the environment and biodiversity. Another alternative is the implementation of environmental insurance as a form of multi-layered compensation for fast treatment with the polluter pays principle.

1. INTRODUCTION

Protection and sustainable use of biodiversity is the main goal of sustainable development goals or SDG's management. However, in reality, there is distortion in the two efforts; in other words, the efforts of both are not always compatible one to another (Uehara et al., 2021). At the level of protection, for example, efforts to maintain biodiversity face serious challenges; even though there have been many efforts to reduce the number of biodiversity extinctions by using a red list approach through the International Union for Conservation of Nature's (IUCN). The IUCN Red List noted that in 2020 there were 35,765 species (28%) that were in the endangered category. (IUCN, 2020) (E.F.M. Lubis, 2022). Kondisi ini semakin mengkhawatirkan pada tahun 2021 dan pada tahun 2022. In 2022, more than 42,100 species (28%) of the more than 150,300 species that have been assessed that declared threatened with extinction (Spiliopoulou et al., 2023)(IUCN, 2022) (Amos, 2021).

This trend needs serious attention so it will stop at certain point. The IUCN uses assessment criteria known as "*Red List Categories and Criteria*" to evaluate the risk of extinction of species. Based on these criteria, species can be classified into various categories, such as "*Least Concern*", "*Near Threatened*", "*Vulnerable*", "*Endangered*", "*Critically Endangered*, etc. (IUCN, 2022). Because of this, the principle of 'no net loss' of biodiversity movement has been promoted (Slootweg, 2005).

There are various reasons for the extinction of biodiversity, among other things include:
1. Many species are increasingly threatened and moving to higher extinction risk categories, especially "Vulnerable," "Endangered," and "Critically Endangered." This indicates increasing pressure on the population of the species.
2. The loss of natural habitat and fragmentation which reduces the species' living space. The condition treagered by deforestation, urbanization and changes in land use.
3. Overexploitation and hunting: some species face extinction due to overhunting and unsustainable exploitation, as in the case of several rare species of fish, mammals and plants.
4. Climate change that affect habitat conditions and migration patterns of species, as well as cause shifts in geographic distribution. This can have a negative impact on certain species, especially those that have a special dependence on certain environmental conditions.
5. Environmental pollution and contamination where water, air, and soil pollution also has a negative impact on many species. Toxins and harmful chemicals can reduce the survival and reproduction of species.
6. Invasion of alien species: insertion of invasive species into native ecosystems can disrupt the natural balance, threaten native species, and cause local extinctions(Robert & Brown, 2004)(Siswanto, 2017)(Shwartz et al., 2023).

As an efforts to prevent biodiversity extinction several actions and strategies had been programed involving a series of actions and strategies at the global, regional and local levels. Some of these efforts are:
1. Establishment and management of conservation areas: establish and maintain conservation areas that protect natural habitats and vulnerable species. National parks, nature reserves and protected forests are examples of areas that can help prevent extinction.
2. Protection and enforcement: strengthen laws and regulations that protect threatened species and their habitats. Strict law enforcement against illegal hunting, wildlife trafficking, and habitat destruction is essential.

3. Sustainable habitat management: managing land and natural resources in a sustainable way, including environmentally friendly agricultural, fishing, and forestry practices.
4. Local community empowerment: involving and supporting local communities in conservation efforts. local residents can become environmental guardians and play a role in maintaining the sustainability of natural resources.
5. Invasive species control: control and monitor invasive species that can damage native ecosystems and threaten endemic species.
6. Research and monitoring: conduct research to understand more about specific species and ecosystems, and monitoring changes as they occur. Accurate data is needed to take effective conservation measures.
7. Ecosystem-based conservation: taking a holistic approach by protecting entire ecosystems, not just individual species. This includes maintaining the relationship between species and the environments in which they live.
8. Public education and awareness: increase public awareness about the importance of biodiversity and the negative impact of human activities on the environment. Environmental education from an early age can form a mindset that cares more about nature.
9. Pollution reduction and climate change: reduce air, water, and land pollution, and reduce greenhouse gas emissions that contribute to climate change. Climate change can disrupt the habitat and lifestyle of certain species.
10. International cooperation: cooperation between countries and international organizations in order to maintain cross-border biodiversity.
11. Habitat rehabilitation: restoring damaged or degraded habitat to give threatened species a second chance.
12. Development of environmentally friendly technology: developing and implementing technology that does not damage the environment and helps in conservation efforts.
13. Implementation of *Good Environmental Management System*

All the strategies above can be combined appropriately to achieve effective results in preventing biodiversity extinction (Organization, 2022)(Sang Ayu Putu Thania Parameswari Eka Putri & Rafika Yuniasih, 2020)(United Nations Environment Programme, 2017)(Akella & Cannon, 2004).

The above biodiversity conservation strategy requires strengthening and alternatives because it is not fully effective; this is proven by the number of endangered biodiversity which has not yet improved. Therefore, other alternative approaches are needed that are more effective in preventing biodiversity degradation. The approach offered in this paper is economic analysis of law (EAL) which prioritizes incentives and compensation as a way to protect biodiversity. This alternative is worth considering, at least the principle has been introduced in the environmental insurance issue with layered compensation by encouraging the internalization of environmental costs based on the polluter pays principle (Wibisana & Putri, 2009).

2. RESEARCH METHODS

The method used in this research is a qualitative normative juridical approach is research which refers to legal norms that aims to identify the essence, values, teachings and legal meaning of data, facts or documents which is studied as a legal documents supported by qualitative analysis. The qualitative normative juridical approach is an approach that refers to the applicable laws and regulations relevant to the efforts of preventing biodiversity degradation.

Using a document study of the available data as an instrument to gather needed information either in international or national level, as well as other public and official documents becomes a next step. To complete the process of extracting the essence, values, teachings Economic Analysis of Law for inhibit biodiversity degradation, reviewing the thoughts of developing experts also carried out.

Analysing data uses qualitative juridical manner in the form of an in-depth interpretation of selected documents presented in descriptive way. Further, data is analyzed qualitatively by outlining descriptive and perspectives analysis using deductive technique. This process completed in order to achieve the purpose of the research systematically, comprehensively, and consistently.

3. RESULT AND DISCUSSION

3.1. The Framework of Economic Analysis of Law

Economic analysis of law (EAL) is a concept that combines economic and legal approaches to make regulations effective. This approach emerged due to the assumption that several branches of legal science could be implemented more effectively if they used an economic approach. Several branches have applied this principle, such as the theory of intellectual property rights; transaction cost economics; public choice theory; and constitutional economics. EAL refers to an economic model to explain human behavior, which was initiated by Richard A. Posner (Mathis & Shannon, 2009b). With this background of thinking, biodiversity degradation problems can also use EAL because they can fall into the category of economic transaction costs and public choices.

Unlike the economic concept which emphasizes efficiency, the EAL approach to preventing biodiversity degradation is focused on providing balanced compensation so that the goal of preserving biodiversity can be achieved. Nevertheless, the element of efficiency as a policy evaluation criterion in the economic regulatory system will remain an important consideration. Ronald H. Coase and Guido Calabresi (1960-1) put forward an important basis for conducting legal economic analysis in the form of a theorem which states that the world of law must analyze its economic impact so that it can instill a dimension of economic efficiency in legal institutions (Coase, 1960).

The compensation approach for balancing biodiversity is becoming increasingly choices as an effort to reverse environmental damage caused by activities that have an impact on the environment. However, this approach is considered still have weaknesses and risks causing more negative impacts than benefits (Karlsson & Edvardsson Björnberg, 2021)(zu Ermgassen et al., 2019). The meaning of biodiversity compensation is compensation for negative impacts on biodiversity caused by development, including financial compensation for affected stakeholders as an effort to biodiversity offsetting (Karlsson & Edvardsson Björnberg, 2021).

The current discussion is about the compensation mechanism in question. Some have proposed using a benefit-cost ratio approach (Gerling & Wätzold, 2021), there is also an approach through the implementation of responsibility or liability combined with insurance (Wibisana & Putri, 2009). However, the function of the EAL approach overall is to ensure the existence of a conservation system and efforts to prevent biodiversity degradation and maintain biodiversity balance or biodiversity offsetting

(Gerling & Wätzold, 2021)(Mathis & Shannon, 2009a).

The definition of economic efficiency refers to optimizing resources to maximize society's welfare (Moore et al., 2021)(Rega et al., 2019). This means that the allocation of resources is carried out in such a way that there is increased utilization of the resources in question in accordance with the goals of the organization (Organization, 2022). In other words, every use of resources and their distribution produces the greatest possible satisfaction or value for society as a whole (E. Lubis, 2021)(Gustiano et al., 2021).

The application of economic principles to the environment is aimed at efforts to restore the function and carrying capacity of the environment but cannot necessarily be applied practically to prevent biodiversity degradation. Some of the things that are considered for the application of these principles include the application of economic principles to the environment to restore the function and carrying capacity of the environment cannot necessarily be applied practically to prevent biodiversity degradation. However, the causes of environmental damage can be part of a strategy to prevent biodiversity degradation in general, and specifically in connection with the application of the EAL concept. Several things that are taken into consideration include: (1) pollution and deforestation (Juan, 2020)(Haldorai et al., 2022); (2) tourism (Haldorai et al., 2022); (3) climate change (Darvishmotevali & Altinay, 2022)(E. F. M. Lubis, 2022); (4) lacking of regional government's role in enforcing environmental laws (Syarifuddin & Damayanti, 2020); (5) not optimal yet the integration of obligations to reduce environmental impacts in investment and business activities (Pellegrini et al., 2020)(Shao, 2021).

One approach that is widely used today is environmental indicators (green indicators) for activities that have an impact on the environment through the implementation of good environmental management (United Nations Environment Programme, 2017)(Sang Ayu Putu Thania Parameswari Eka Putri & Rafika Yuniasih, 2020). The standards used in this context refer to ISO 14001. Obtaining an ISO 14001 certificate provides a position for companies to provide information to consumers about the company's vision which can also become a selling point for the company concerned (Goerger, 2021) (Potoski & Prakash, 2005).

The implementation of an environmental management system (EMS) has a positive impact on the environment. Goerger's research result in 2021 showed that there was a 6.7% reduction in water use and an 18.7% increase in pollution reduction investment. However, there is no significant data yet to estimate its impact on CO2 emission levels and water pollution; even EMS certified factories show an increase in hazardous waste production of up to 8.6% (Goerger, 2021).

According to Conboy, the application of EAL in legal science is by evaluating the process, formation, structure and impact of laws and/or policies on society for the welfare of society in turn. Apart from that, the essence of economics in the form of efficiency is defined as obtaining benefits that must be greater than the effort or costs incurred (cost-benefit analysis) which in order can provide an overview of justice; because it means that creating just laws must be efficient. Thus, EAL is based on three basic concepts, namely value, utility and efficiency which are based on human rationality (Mathis & Shannon, 2009a)(Helm & Hepburn, 2012).

The principle of legal economic analysis, then, aims to balance losses arising from a certain phenomenon by calculating economically the losses in question and to maximize the benefits of a limited resource, or in other words, law as a tool to increase efficiency (Sugianto, 2015). The principles obviously, can be applied to prevent biodiversity decline by paying attention to the elements causing the degradation in question (Dunn, 2017)(zu Ermgassen et al., 2019)(Yin et al., 2021).

To summarize the EAL concept for preventing biodiversity degradation, can be described as follow:
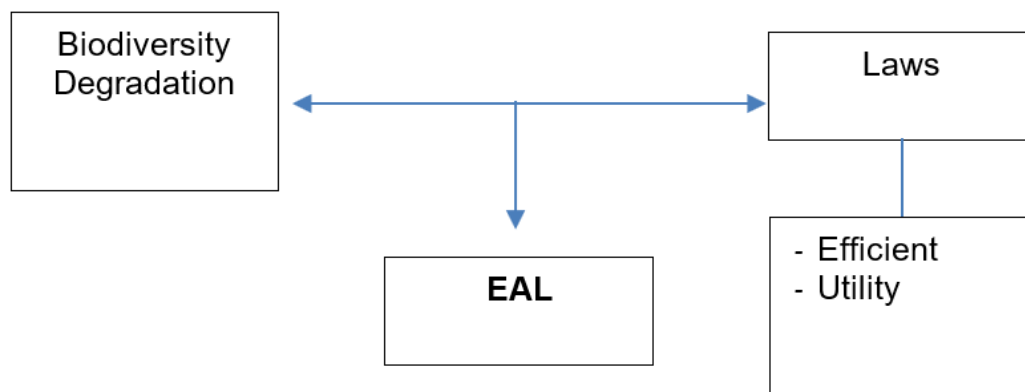

Figure 1: EAL concept for preventing biodiversity degradation.

3.2. The Embodiment of the EAL Concept in Preventing Biodiversity Degradation

As explained above, the EAL concept is analyzing legal problems from an economic perspective or also called legal economics. History shows that legal issues always have an economic dimension (Soetopo dan Seno Adji, 2015). Besides order as a goal of the law, expediency is also another goal of application of the law. This idea was first conveyed by Jeremy Bentham who stated that good law is that which can provide the greatest benefit or happiness to the greatest number of people. This becomes the foundation of EAL theory (Bentham, 2000).

EAL concept for preventing biodiversity degradation continuously based on principle efficient and utility or expediency. Efficient means a comparison between the resources used in a process of carrying out preventing biodiversity degration in legal framework, with the results achieved which is called as eco-efficient. The fewer resources used, such as energy, time and costs, but can produce output in accordance with plans or expectations, the more efficient it will be considered (Wolff et al., 2018). While utility or expediency means usefulness or the quality of being convenient and practical of biodiversity. In this term utility of biodiversity aimed at utilizing, distributing benefits fairly to achieve economic growth, providing quality biodiversity, and increasing and maintaining care between generations (E. Lubis, 2020).

The principle of EAL as a tool for preventing biodiversity degradation was explained by Coase in 1960, which also became the forerunner of the EAL concept relating to the exhaust of factory fumes which had a dangerous impact on residents of nearby properties. With an economic analysis approach, the emphasis on solving the problem is in measuring the responsibility of the factory owner to recover damage caused by smoke, there are 2 (two) ways: (1) imposition of tax based on the amount of smoke

produced, which is equivalent to the damage it causes; (2) move the factory from residential or densely populated areas (Coase, 1960). Coase's thinking was further developed by Richard Posner who published his book in 1973 with the title Economic Analysis of Law, stating that economics was created by rational actors who thought about how the limited resources they faced could maximize their wealth (Posner R. A. & Aspen Publishers, 2014).

The application of EAL in anticipating biodiversity degradation based on efficiency and utility can be implemented in 2 ways, namely (1) financial incentives, and (2) non-financial incentives.

3.2.1. Implementation EAL as Financial Incentives to Prevent Biodiversity Degradation

The principle of regulation regarding to biodiversity ensuring that the quantity of biodiversity remains sufficient to be used sustainably so that future generations who can also enjoy it qualitatively. In this sense, financial incentives focus on prevent biodiversity degradation. In order to identify an activity requiring economic incentives, IUCN has developed procedure as follow:
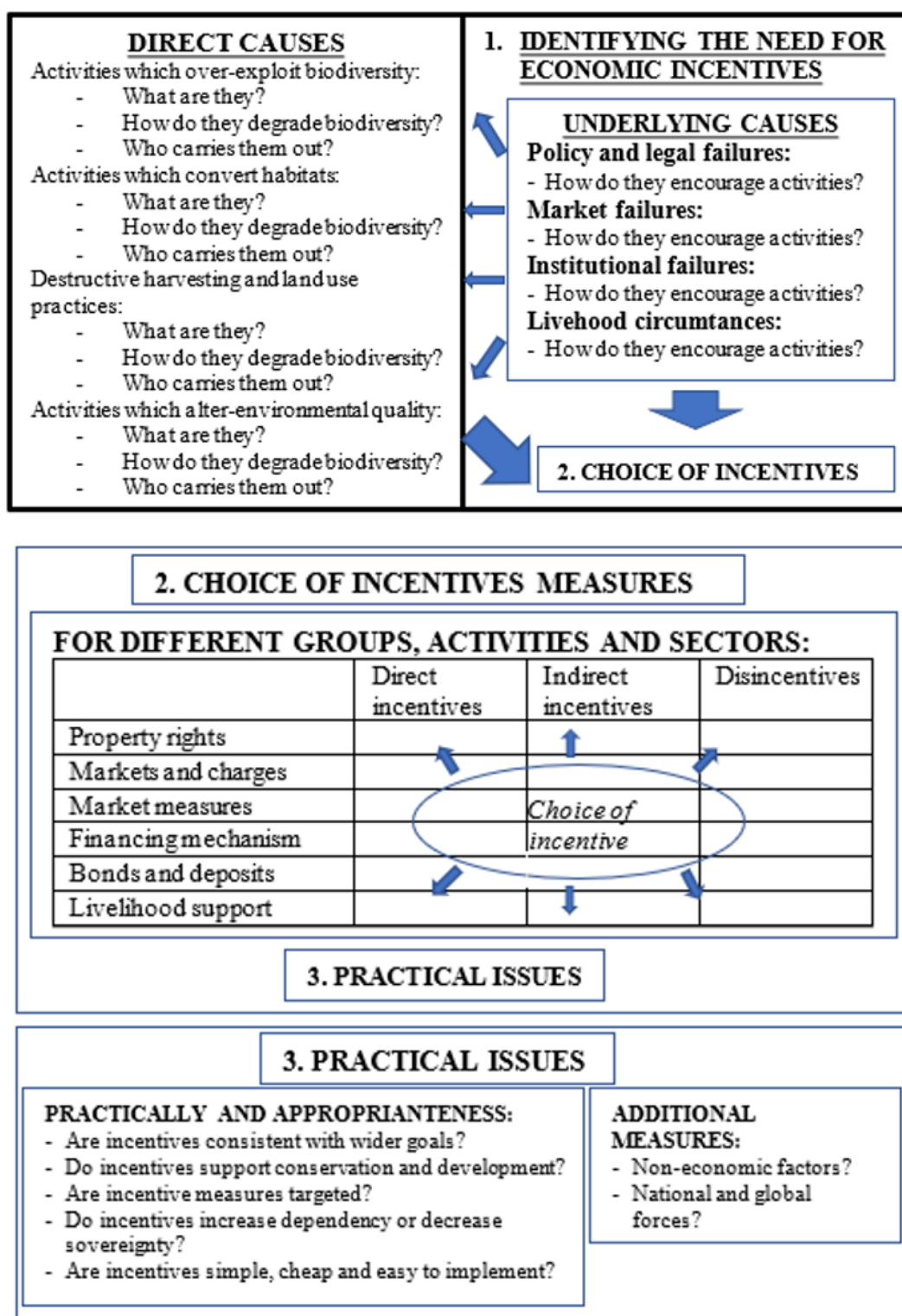

Figure 2: Identification activity enquiring economic incentives.
Source: (IUCN, 2000).

According to Figure 2, economic incentives can be implemented after careful evaluation whether the activities causes degradation to biodiversity in term of market and finance measures. Financial incentives to prevent biodiversity degradation will be successful if the community gets real benefits and understands the benefits of repair or restoration such biodiversity. Incentives in direct monetary form are preferable and effective in the short term, but not in the long term. Effectiveness will increase if combined with other incentives such as training and involvement of local communities. Several forms of monetary incentives include (Wainaina et al., 2021):

1. Tax exemptions for the use of technology, land use, and other business forms that have an impact on biodiversity protection (IUCN, 2000). Examples this strategy can be seen in Eritrea; which implements taxes and energy subsidies which are used to encourage the use of forest-saving oriented technologies (Emerton, L. and Asrat, A., 1998). Other examples are encouraging efficiency in harvesting techniques, training people in process skills or investigating new products and technologies that have an impact on reducing biodiversity degradation (Helm & Hepburn, 2012).
2. Community benefit-sharing which has been widely used to conserve biodiversity by planting palm-like species of mangroves whose leaves can be used as straw houses that can be sold, so that they can become a source of income for the community (McNeely, J, 1993). For sustainability, a resource inventory related to the preservation and sustainable use of mangroves is also being developed so that they are more efficient, have added value and are sustainable. Kenya has implemented this practice, so far (IUCN, 2000).
3. Establishing a Development Fund as a mechanism to distribute some of the income generated from protected areas as practiced in Kasungu National Park, Malawi. Distribution is given to the community in the form of the right to harvest tree caterpillars, build beehives, and other economic potential that is mutually supportive of the protected area (Barrow, E., 1996). It was recorded that the results obtained between 1991 – 1995 reached US$ 1.25 million, part of which was allocated for the development of protection and sustainable use of protected areas, including education, water supply and health. Currently, development also includes the activities of subsistence farmers who grow corn, beans and peanuts, which are the country's strength local products (IUCN, 2000).
4. Biodiversity investment through inviting the private sector and the wider community. To be able to do this, biodiversity must be made investment accessible and marketable. The investment opportunities must be created for private involvement, both in terms of ownership and control of biodiversity as well as in supporting sustainable biodiversity-based businesses such as resource extraction and processing tourism biodiversity-based. One successful investment using this pattern is implemented in Serengeti National Park, Tanzania. This three-party joint venture between commercial companies, the local Village Council and bilateral donors, will provide most of the soft loan-based investment funds. A 40 years land lease has been agreed with the Village Council for the construction of a 30 bed camp and will be renewed every 5 years. Profit sharing for the parties comes from renting places and activities related to preserving and/or reducing biodiversity degradation. The results obtained by the village reach US$ 20,000 a year, in addition to other income opportunities for the village community and the opportunity to work in this activity. People who come to this camp also get a reduction in tax payments (IUCN, 2000).

As a comparison, in Table 2 describes several financial instruments developed by The Organisation for Economic Co-operation and Development (OECD) to prevent biodiversity degradation based on efficiency and utility.

Table 1: The OECD Financial Instruments for Preventing Biodiversity Degradation.

Instrument	Finance	Coverage	Source
Biodiversity-relevant taxes	USD 7.5 billion	OECD countries	OECD PINE database
Payments for ecosystem services	USD 10 billion	10 large PES program	OECD desk research
Biodiversity offsets	USD 4.8 billion	Global	Bennet et.al
Bilateral allocable biodiversity-related ODA	USD 8.3 billion	OECD DAC members	OECD CRS database

Source: (OCDE, 2018).

3.2.2. Implementation EAL as Non-financial Incentives to Prevent Biodiversity Degradation

Efficiency and utility could also be measured by non financial incentivies through programs and/or activities; inter alia: (1) access and utilization of biodiversity, (2) subsidies for biodiversity conservation activities, and (3) good biodiversity management systems (GBMS).

1. Access and utilization of biodiversity becomes another alternatives as non financial incentives. Arrangements for access to biodiversity were agreed internationally in 2011 and Indonesia has been ratified it through Law Number 11 of 2013 concerning Ratification of the Nagoya Protocol on Access to Genetic Resources and The Fair and Equitable Sharing of Benefits Arising from Their Utilization to The Convention on Biological Diversity. According to Nagoya Protocol, there are several principles on biodiversity utilization, including: (1) pay attention to and respect the sovereignty of the country where biodiversity is located. States have sovereignty and sovereign rights to exploit natural resources in accordance with their environmental and development policies and have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other countries or areas outside the boundaries of national jurisdiction; (2) regulating access to the biodiversity or genetic resources within a jurisdiction is carried out by agreement on the basis of prior informed consent (PIC) as outlined in a collective agreement; (3) collaboration between countries in cases of alleged violation of access requirements in the contract; (4) inclusion of contractual provisions regarding dispute resolution in the collective agreement and ensuring the availability of other opportunities to resolve disputes arising from the collective agreement (MAT); (5) monitor the use of genetic resources (biodiversity) after they leave a country through the establishment of effective checkpoints at all levels of the value chain: research, development, innovation, pre-commercialization or commercialization; (6) transfer of relevant technology and financing for the sustainable use of its components is necessary; and (7) access does not apply directly to biodiversity protected by intellectual property rights (IPR). Access to IPR-protected SDGs must be in accordance with relevant international and national provisions.

Prior informed consent (PIC) in the form of this document contains notification from the applicant regarding all information in the context of access activities to biodiversity provider countries as consideration in granting access approval. The essence of PIC is involving and considering the position of all stakeholders, especially indigenous, traditional and local communities who have a direct or indirect impact on these access activities. Protection of the rights of indigenous, traditional and local communities related to biodiversity in their territory, including protection of traditional knowledge related to biodiversity (E. Lubis, 2009).
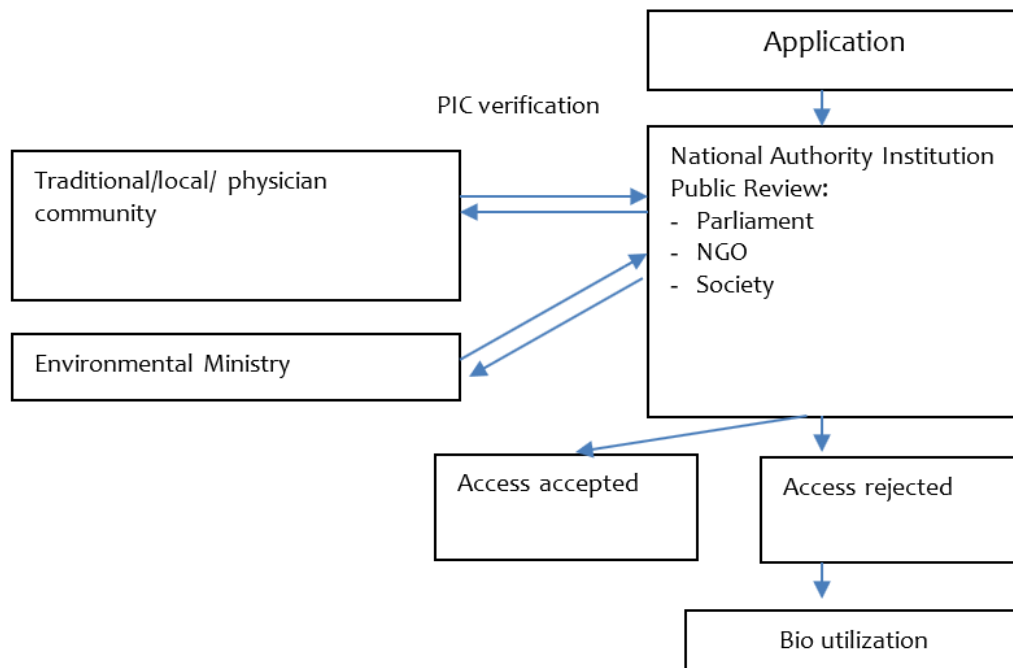
Figure 3: Access to Biodiversity Principle.
Source: Lubis, 2009.

In access term, the involvement of authoritative institutions is very important. In addition, considering that access to biodiversity is also related to access from foreign parties, therefore a national authority institution will be effective.

2. Subsidies for biodiversity conservation activities are important and must be carried out carefully to avoid incentives harmful to biodiversity. This occurs due to the emergence of unanticipated and unintentional side effects. Policy of providing chemical fertilizer subsidies to farmers, for example which can result in excessive use of fertilizer and/or inhibit other methods that can improve soil quality, thereby impacting biodiversity degradation (Lehmann, 2012). This incentive is thought to be one of the causes biodiversity degradation. Changes in land use and marine resources are the biggest cause of biodiversity loss in the last 50 years. It is estimated that 70% of biodiversity loss on land and 50% in freshwater by 2050 will be caused by unsustainable agricultural practices. A report from Andrew Deutz et.al in 2019 stated that subsidies for agriculture, fisheries and logging that damage nature reached a value of US$ 273 – 542 billion; exceeding total global spending on biodiversity conservation by two to four times (Deutza, Andrew et al., 2020).

Include in this incentive is biodiversity-relevant subsidies is in the form of subsidies for forest management and reforestation, subsidies for organic or environmentally friendly farming, for pesticide-free cultivation, and for land conservation (OCDE, 2018);

Another aspect is payments for ecosystem services (PES) can be defined as: (1) voluntary transactions (2) between service users (3) and service providers (4) that are conditional on agreed rules of natural resource management (5) for generating offsite services (Wunder, 2015). PES are based on the user- or beneficiary-pays approach.

3. Good biodiversity management is aimed at managing impacts from community treatment of biodiversity. However, by paying attention to the unique nature of biodiversity in the context of purchasing and supply chain management (PSCM), biodiversity management will have different management mechanisms from environmental management. These differences include: loss of biodiversity is something that is difficult to understand even for experts (Whiteman, G., Walker, B., Perego, P., 2013). Besides, the biodiversity concept also covers various meanings, making it difficult to interpret (Quarshie et al., 2021). Further, biodiversity destruction is difficult to observe, even when the scale is very large, or occurs close to us (Stager, 2018). Lastly, in the PSCM context the loss of biodiversity at every level of supply makes it difficult to overcome problems in this sub-sector (Villena and Gioia, 2018; Marttinen and K¨ahk¨onen, 2022). Therefore, biodiversity management needs to receive greater and special attention (Cousins et al., 2019; Sancha et al., 2019)(Salmi et al., 2023).

Biodiversity management focuses on(Salmi et al., 2023): (1) sustainability, circularity and transparency of raw materials from nature; (2) sustainable for forest products and bio-economy; (3) fresh, safe and sustainable, prioritizing domestic raw materials for logistic. In the fisheries sector, for example, there is a policy of minimizing catch, and preventing or minimizing the catch of harm to endangered species; (4) encouragement of healthy business (fairtrade) and organic practices that promote sustainable use of biodiversity for supplier sector; and (5) strong biodiversity and good tourist purposes for restoration in recreating wetlands, planting native plants, and controlling pests and weeds.

In general, activities in biodiversity management still refer to environmental management systems (EMS) that have been well developed (Gustiano et al., 2021)(Kurniawan et al., 2020)(IUCN, 2000)(Astirin, 2000).

International management standard that strongly recommended such as International Organization for Standardization atau ISO 14001 combined with ISO 26000. This standard can be a complement to optimizing the economic and business side by utilizing biodiversity. Biodiversity management systems that can be adopted include EMAS (Eco Management and Audit Scheme) which is a management system developed in EU countries (Vuspitasari et al., 2021)(Gantioler et al., 2009) (Astirin, 2000).

Part of GBMS is biodiversity-relevant taxes that impose a tax on pesticides, fertilizers, forest products and timber harvests, for example it is hoped to provide incentives for producers and consumers to behave more environmentally friendly. The tax in the form of additional costs on the use of natural resources;

Another incentive is biodiversity-relevant fees and charges can be entry fees to national parks, hunting permit fees, land waste disposal fees (such as for the Great Barrier Reef area in Australia), groundwater extraction fees, and fines for non-compliance related to biodiversity; and

Biodiversity-relevant tradable permits comprises individual transferable quitos (ITQs) quotas for fisheries, tradable

development rights, and tradable hunting rights. These policy instruments (also referred to as cap-and-trade programs) set limits on the total amount of natural resources that can be exploited. Individual permissions are then granted to users so they can also trade (OCDE, 2018)

4. Corporate Social Responsbility (CSR). The use of CSR has been widely discussed in relation to environmental and community empowerment (E. Lubis & Sinaga, 2018)(Sarmawa et al., 2021)(et al., 2022). However, there is still not much use of CSR for biodiversity specifically, while the issue of stopping ecosystem damage throughout the world has become stronger in the last decade (IUCN, 2000)(Slootweg, 2005) (E. Lubis, 2021)(IUCN, 2020). For this attempt United Nation General Assembly (UNGA) has been formulated a sustainable development agenda called sustainable development goals (SDGs) in 1975 in which sets out 17 interrelated development agendas designed to serve as a "shared blueprint for peace and prosperity for people and the planet, now and in the future". SDGs emphasize environmental, social and economic aspects that are interconnected in sustainable development by placing sustainability as the main problem (Kanter et al., 2016).

Many tools and techniques have been developed to predict, measure, or report activities that impact biodiversity, including environmental impact assessments, audits, sustainability reporting, and certification such as ISO 26000:2010 regarding guidance on social responsibility. CSR is a mechanism that cannot be separated from the fact that the social dimension influences every business activity; especially businesses related to the use of natural resources. CSR views corporate activities as integrated and sustainable socio-economic activities (Sarmawa et al., 2021).

The application of CSR as a tool in preserving and/or utilizing biodiversity in a sustainable manner uses a biodiversity-oriented CSR practices approach. According to Boiral and Heras-Saizarbitoria CSR in this case is aimed at managing two things: mitigation of activities that have an impact on biodiversity degradation (avoidance of impacts, minimization and compensation, and provision of care), and procedural activities that provide support for better integration of biodiversity issues through generation and dissemination of knowledge, development of management capacity, governance and funding (Wolff et al., 2018).

Biodiversity as an indicator of environmental health as well as the health of companies that pose a risk to the environment requires a synergistic approach between CSR and CBD objectives in environmental-economic-society relations. The relationship between these three important issues can be described as follows:

Table 2: Environmental, economy, and society sinergy to prevent biodiversity degradation

	Biodiversity (CBD)	Sustainable Business (CSR)	Sustainable Finance	Sustainable Development
Environment	Biodiversity Conservation	Environmental Protection	Environmental Value	Environmental Protection
Economy	Sustainable Use	Economic Growth	Economic Value	Economic Development
Society	Equitable Sharing	Social Equity	Social Value	Social Development

Source: businessandbiodiversity.org.

5. Biodiversity insurance can be an alternative for maintaining biodiversity especially. So far, environmental insurance that in market today is not enough to protect biological diversity uniqueness, the aspect must be part of the calculation is sustainable use of the natural resource for the greatest possible prosperity of the people and at the same time maintaining its sustainability indefinitely. Developing the environmental insurance system, the best protection for biological or genetic diversity is proposed through biological insurance with specific term and condition in accordance with its characteristics. (E. Lubis & Al Iksan, 2023)(Chandellier & Malacain, 2021).

4. CONCLUSION

Economic Analysis of Law as a basic principle for preventing biodiversity degradation, it can be applied by combining the principles of efficiency with compensation. EAL is a concept that combines economic and legal approaches to make regulations effective. Further, the EAL approach to preventing biodiversity degradation is focused on providing balanced compensation so that the goal of preserving biodiversity can be achieved. Nevertheless, the element of efficiency as a policy evaluation criterion in the economic regulatory system will remain an important consideration besides utility.

The EAL concept affects a comparison between the resources used in a process of carrying out business or work, with the results achieved. The fewer resources used, such as energy, time and costs, but can still produce output in accordance with plans or expectations, the more efficient it will be considered.

The realization of EAL in preventing biodiversity degradation can be implemented in 2 (two) forms of incentives: financial and non-financial. Financial incentives in the form of tax exemptions for the use of technology, land use and other forms of business that have an impact on biodiversity protection. Apart from that, financial incentives can also take the form of efficiency in harvesting techniques, training people in process skills or investigating new products and technologies that have an impact on reducing biodiversity degradation. Another form of incentive is community benefit-sharing which can involve the wider community, and the most challenging thing is inviting and inviting the private sector and the wider community to invest in biodiversity.

In the non-financial incentive group, the EAL concept could be in the form of biodiversity management; access and rights to use biodiversity; subsidies for biodiversity conservation activities, including the implementation of corporate social responsibility in company activities that have an impact on the environment and biodiversity. Another alternative is the implementation of biodiversity insurance as a form of multi-layered compensation for fast treatment with the polluter pays principle.

To sum up, the EAL concept for preventing biodiversity degradation as follow:

Table 3: the EAL concept for preventing biodiversity degradation.

No	Degradation factof	The EAL Aspect	Incentives
1	Habitat/frag-mentation loss	Recovery fees/ incentives	access and utilization rights to biodiversity, GBMS; biodiversity-relevant subsidies, payments for ecosystem services;
2	Over-exploitation	Compensation/incentives to replace exploitation	community benefit-sharing, access and utilization of biodiversity management, GBMS, CSR, biodiversity insurance;
3	Alien species invasion	Prevention and recovery costs	CSR, biodiversity insurance;
4	Accompanying extinction	Recovery costs	subsidies for biodiversity conservation activities, CSR, biodiversity insurance;
5	Community culture	Incentives to strengthen community culture	access and utilization of biodiversity utilization, (2) subsidies for biodiversity conservation activities, Corporate Social Responsbility (CSR)

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