



Unveiling Intrinsic Value in Biodiversity Accounting: A Challenge for Accountants in Indonesia

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ABSTRACT

This study aims to develop a conceptual framework of biodiversity accounting within the frame of intrinsic value using a deep ecological concept approach. This approach views biodiversity has inherent value as an object in the environment. Despite the difficulty to measure the intrinsic value of biodiversity, several studies have developed and used different methods for assessing and unveiling biodiversity in the entity's reports. It has been a challenge for accounting science and the accounting profession in Indonesia to develop biodiversity accounting which can be incorporated into the entity's financial statements. Therefore a conceptual framework is needed to integrate the intrinsic value. The proposed conceptual framework is developed from the first level, which is the policy or regulation as the basis for planning ecological activities. It is followed by the second level, i.e. the implementation process in the form of specific projects. Finally, the third level is the evaluation of the performance of the entity's ecological activities (P3FEA).

Mengungkap Nilai Intrinsik ke dalam Akuntansi Biodiversitas: Sebuah Tantangan Bagi Akuntan di Indonesia

ABSTRAK

Tujuan penelitian ini adalah untuk mengembangkan kerangka konseptual akuntansi biodiversitas dalam bingkai nilai intrinsik dengan pendekatan konsep deep ecology. Pendekatan tersebut memandang biodiversitas memiliki nilai inheren yang melekat pada dirinya sebagai objek dalam lingkungan. Meskipun cukup sulit mengukur nilai intrinsik biodiversitas, beberapa penelitian telah mengembangkan dan menggunakan metode yang berbeda-beda dalam menilai dan mengungkap biodiversitas dalam laporan entitas. Hal ini merupakan tantangan bagi ilmu akuntansi dan profesi akuntan di Indonesia untuk mengembangkan akuntansi biodiversitas sehingga dapat diungkapkan dalam laporan keuangan entitas. Oleh karenanya diperlukan suatu kerangka konsep untuk mengintegrasikan nilai intrinsik tersebut. Kerangka konsep yang dibangun dimulai dari level pertama yaitu kebijakan atau regulasi sebagai basis perencanaan aktivitas ek proses implementasi berupa proyek spesifik dan terakhir level ketiga yaitu evaluasi kinerja aktivitas ekologi entitas.

1. Introduction

Biodiversity is the diversity of living creatures including a variety of species in an ecosystem.

According to (Cipullo, 2016), biodiversity refers to the variety and variability of life on earth, from the genetic, species into the ecosystem level

(including various human and non-human organisms such as microbes, fungi, and invertebrates) and includes the underlying ecological and evolutionary processes. The issues of biodiversity-related to environmental preservation and protection are often associated with sustainability development, which focuses on the commitment to improve environmental quality without compromising the needs of future generations.

Moreover, several opinions state that biodiversity management is part of the Corporate Social Responsibility (CSR), which is an embodiment of the sustainable development concept that must be carried out by entities as the commitment to the international conventions in the Trust Fund for the Core Program-Budget for the Biosafety Protocol (BG)) FUND 9340 INS (Cartagena Protocol) in 2000 and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1975. This commitment manifested by the Indonesian Government through various regulations including Law No. 5/1994 concerning ratification of the United Nations Convention on Biological Diversity and the establishment of the Indonesian Biodiversity Strategy and Action Plan (IBSAP) for the period of 2015-2020.

The biodiversity value and environmental ethics are often linked by several studies to examine human behavior in utilizing the environment and how it is disclosed. O'Connor & Kenter (2019) Samkin et al., (2014) and Sizemore (2015), describe biodiversity values into several categories, intrinsic, instrumental and relational values. The grouping is based on considering the usefulness of nature/environment to humans. The intrinsic value philosophy is more directed to the deep ecology approach (Naess, 1973), is oriented to the philosophical view of non-anthropocentrism (Callicott, 1984). This philosophy is different from anthropocentrism, which focuses on human interests in utilizing their environment. While non-anthropocentrism views that the environment has

a broader intrinsic value than just economic instrumental value for human interests. Humans are assumed to be part of the environment and considered valuable because there is a lot of valuable life attached to the environment itself. The universe is a life containing a variety of lives, giving life and supporting life, including human life (Keraf, 2014).

Sessions & Naess (1986) judgment regarding intrinsic value is that in the life of living things and their interactions with the environment, humans, and non-humans creatures have inherent values, in which these values do not depend on the usefulness of the environment or non-humans organisms that are intended for the benefit of humans.

Furthermore, O'Neill (1992) added that intrinsic value or non-instrumental value has a goal that is not related to human interests, and every object has its intrinsic value that is independent of the valuer valuation. Thus, the intrinsic value of non-humans is meta-ethical. Referring to those arguments, the concept of intrinsic value has a deeper ethical meaning than just the interaction of humans and other living things in the context of its usefulness to humans. Due to its intrinsic nature coming from within living things, Taylor (1996) argues that this value will be difficult to measure economically because economists usually look at the environmental values that can be calculated (environmental goods and services).

Several assessment methods have been developed to integrate the intrinsic value of biodiversity hence it can be disclosed. The biodiversity assessment model can be both metric and non-metric. The metric approach uses numbers measured by the resource approach called instrumentalist non-intrinsic measurements (Freeman & Groom, 2013; M. J. Jones, 2003, 2010; Maseyk et al., 2016). While the non-metric approach is an intrinsic measurement that takes into account all values of life (O'Connor & Kenter, 2019; Sheng et al., 2019; Sizemore, 2015). The

existence of those valuation methods shows that the measurement of intrinsic value is not only discourse in biodiversity but also can be developed in a policy that will affect the development of accounting in biological disclosure.

Therefore, we believe that a method or conceptual framework is needed to integrate these values in biodiversity accounting, which is not only at the policy level but also in applied sciences. This is in line with the opinion of Naess (1973), where the intrinsic value with a deep ecology approach is not just a philosophy that can obscure the meaning of deep ecology but has a political nature that can influence policies in environmental management.

The study of biodiversity accounting is still ongoing both in the analysis and the implementation aspects. Some researchers still use different valuation methods in assessing biodiversity entities (Freeman & Groom, 2013; Jones, 2003, 2010; Maseyk et al., 2016). In addition to the specific factors of the entity's business, the unique and diverse characteristics of biodiversity are also influencing the emergence of debates and challenges in biodiversity accounting. In Indonesia, biodiversity accounting has not been clearly regulated and limitedly covered in the Indonesian financial accounting standards (or SAK).

In the history of financial accounting standards, this issue had been regulated in Statement of financial accounting standards (PSAK) No. 23 regarding forestry industry accounting in 1994, but then revoked by the Indonesian financial accounting standards board in January 1st, 2010, when the international accounting standard (IAS) 41 on agriculture as its successor was introduced. The standard has been adopted into PSAK No. 69 regarding Agriculture which regulates the recognition, measurement, and disclosure of agricultural activities.

The scope of agricultural activities is limited to biological assets (except productive plants), agricultural products at the harvest point, and

government grants that fall within the criteria of biological assets. Meanwhile the substance aspect and biodiversity material have not been discussed thoroughly in PSAK No. 69 Tahun 2019 as it only covers a small part of the biodiversity component, where the biological assets are referred to the products produced from the use of agricultural land (productive plants).

Besides, productive plants are regulated in PSAK No. 16 Tahun 2019 regarding fixed assets, while the land used as agricultural land is regulated in several different standards, which are PSAK No. 16 Tahun 2019 concerning fixed assets, PSAK No. 13 Tahun 2019 concerning Investment Property, and ISAK No. 25 Tahun 2019 concerning Land Rights.

The value of biodiversity recognized in accounting standards is still instrumental because it only recognizes its economic benefits for the entity. Conventional accounting does not capture the impact of human activities on the natural environment (Jones, 2010), where further disclosures are summoned through voluntary sustainability reports. Several factors causing biodiversity accounting does not include non-human aspects are due to the philosophical and scientific issues, accountability issues, technical accounting problems, and problems of accounting practices (Jones et al., 2013).

It is a challenge for accountants to be able to develop biodiversity accounting, which is not only at the level of concepts and normative aspects, where public entities have already submitted this information in the additional reports, but also to think about how the value of biodiversity in the concept of deep ecology can be identified, assessed and revealed in the entity's formal report.

Our research regarding the existence of intrinsic value into biodiversity accounting is a form of response to the existing regulations and Indonesia's commitment in managing biodiversity. Moreover, the current state of the tendency in the biological disclosure is still focusing on the instrumental values of existence. Even though the

initial studies of intrinsic value in entity reports have been conducted in Indonesia (Heniwati & Asni, 2019), this research is limited to reporting biodiversity on one extractive entity and does not discuss in detail how the biodiversity assessment method is used as the basis for disclosure in entity's reports. Therefore, this paper presents several assessment methods in recognizing and reporting biodiversity, which is summarized from reviews of the previous research.

The purpose of this paper is to provide an overview of the conceptual framework for the assessment and disclosure of biodiversity using the concept of intrinsic value. The conceptual framework used is adopted from the study of (Samkin et al., 2014). The results are expected to contribute to the development of biodiversity accounting and enhance the repertoire of biodiversity studies, especially in Indonesia.

2. Biodiversities in Indonesia

Indonesia is one of the countries with abundant biodiversity power based on the amount of biodiversity that spread over 7 (seven) bioregions, Sumatra, Java and Bali, Kalimantan,

Sulawesi, Little Sunda Islands, Maluku, and Papua. Based on the National Biodiversity Index (NBI), Indonesia has the highest index of all the ASEAN countries (Campos-Arceiz et al., 2018; Rintelen et al., 2017).

BAPPENAS (2016) classifies biodiversity in Indonesia into three levels as shown in Table 1. First, ecosystem biodiversity is biodiversity that includes natural ecosystems (marines, limnics, semi-terrestrial, and terrestrial), and artificial ecosystems (rice fields, mixed gardens, fields, yards, and ponds). Second, species biodiversity is the variations in the types of organisms that occupy an ecosystem of both inland and sea. Third, genetics biodiversity is the diversity of individuals in one type that has different genes between one individual and another.

Table 1 shows that Indonesia has many biodiversities spread across all the three biological levels with a total amount of resources that have not been yet known within terms of number, type or potential (Widjaja, 2014). The extent of biodiversity and the nature of its identification will have an impact on the disclosure of biodiversity in certain entity reports.

Table 1 Biodiversity classification in Indonesia

Ecosystems biodiversity:	Species biodiversity:
A. Natural ecosystem	A. Marine biota
1. Marines ecosystem (salt water)	Sea animals
a. Neritic zone	1. Algae
b. Coral reefs	2. Sea plants
c. Seagrass	3. Microba
d. Ocean zone	B. Terrestrial biota
2. Limnic ecosystem (fresh water)	1. Sea animals
a. River ecosystem	a. Vertebrata
b. Lake ecosystem	b. Invertebrata
3. Semiterrestrial ecosystem	2. Algae
a. Mangrove ecosystem	3. Aea plants
b. Riparian ecosystem	4. Microba
4. Terrestrial ecosystem	Genetics biodiversity:
a. Lowland vegetation (<i>hutan pamah</i>) ecosystem	A. Animals
b. Mountain ecosystem	1. Fisheries
B. Artificial ecosystem	2. Farms/livestock/husbandry
1. Rice fields	B. Plantations
2. Mixed gardens	1. Food plantations
3. Moor	2. Horticulture
4. Yards	3. Crops plantation and industry
5. Ponds	4. Spermatophyta microba
6. Fish ponds/embankments	

Source: IBSAP 2015-2020

3. Ecology and intrinsic value

The Deep ecology concept was introduced by Naess (1973) in his article "The Shallow and The Deep, long-range ecology movement". The concept distinguishes two characteristics of the ecology movement, which are the shallow ecology movement and the deep ecology movement. The shallow ecology is human-centered, where humans are separate from the universe and are regarded as the only source of value (Samkin et al., 2014).

Naess (1973) states the main purpose of this movement is for the health and prosperity of people in developed countries, which means that people become the dominant factor in utilizing all the potential in the environment for its interests. The level of human dominance in controlling and utilizing the environment tends to ignore the existence of other non-humans creatures, thereby the values attached to this view are instrumental. In biodiversity studies, instrumental values depend on how far biological values are beneficial to humans (Justus et al., 2009).

Conversely, the deep ecology concept is non-anthropocentrism and is considered to have more ethical meaning in the behavior between human relations and the universe. This view is based on environmental philosophy, where the universe must be viewed objectively as having intrinsic value regardless of human desires, needs, and interests. Naess (1973) outlined this view from the perspective of the deep ecology movement inspired by the failure of European and North American civilizations to preserve the environment as a result of human-centered instrumentalization arrogance, where technology, pollution and excessive use of resources harm biological diversity. When the focus of environmental conservation is on human interests and creates harm to non-humans creatures, then this view is shallow ecology. Meanwhile, the deep ecology movement is more normative by prioritizing the norms, rules, and values of the universe.

There are 2 (two) normative approaches that distinguish deep ecology from other ecological perspectives and constitute the core of worldview, which are biocentrism and self-realization (Jacob, 1994). The first principle, biocentrism, can be considered as the main shield in criticizing the anthropocentrism view which is the main cause of contemporary environmental problems. This principle tends to be considered as the main solution to the ethical problem of anthropocentrism. Biocentrism consists of four main dogmas: (1) all forms of life are interdependent; (2) all species have intrinsic value; (3) humans do not have a special role in the biosphere; and (4) humans are not inherently superior to other species (Taylor, 1996).

Although in deep ecology, biocentrism is regarded as an intuitive principle, it does not logically originate from scientific knowledge (Naess, 1973), but the core hypothesis of biocentrism is biospheric interdependence, where it has been proven scientifically and postulated in the theory of (Lovelock, 1982; Vernadsky, 1945). These theories have been independently developed and confirmed by a series of empirical observations (Jacob, 1994).

The second principle, self-realization, is the principle of self-realization or self-awareness. This principle assumes that humans realize themselves by developing all the potential that exists in themselves. Devall & Sessions (1984) state that self-realization requires self-identification that goes beyond humans aspects to enter the non-human world (Jacob, 1994). Self-identification means the combination of the spiritual and material aspects of reality that takes place in the ecological community. Moreover, the spiritual aspect means that humans believe that biodiversity is a creation of God Almighty so it needs to be protected and preserved. While the material aspect means that humans recognize the existence of non-humans in the universe which is also an element of biodiversity, where it should be harmony between humans and nature.

Examining further the biocentrism and self-realization principles in the ecological community means that the intrinsic values inherent in the biological entity should be assessed objectively. Although Naess (1973) in his deep ecology view does not explain and elaborate further on how to measure the value, in the implementation phase, the concept involves both local and global political issues in dealing with environmental issues such as excessive degradation of natural resources. In this sense, intrinsic value is in the realm of ontology and not in the ethical or epistemological domain (Glasser, 1996; Naess, 1973; Sessions & Naess, 1986).

However, a different perspective is given by Norton (1992) states that intrinsic value is an independent value possessed by an object given by its valuer, wherefrom the non-human perspectives, the intrinsic value contains is not to make ethical but meta-ethical claims. This is subjective given the objectivity of intrinsic values. According to Kant (2005), the term objectivity in materiality is when the assessors judge in the same way by assuming the principles of rationality and morality

4. Biodiversity assessment in the frame of intrinsic value

The issue of how to manifest the intrinsic value on a measurement scale as a biodiversity value has been widely debated. The broader scope of biodiversity characteristics and the difficulty of being identified are several problems in conducting assessments and disclosures of biodiversity accounting, where according to Svoboda (2011) there is no objective evidence that can be obtained to measure the intrinsic value of non-humans. The basic idea is that humans do not have the right intuitive ability to understand the traits inherent in intrinsic non-human values directly and independently. However, the development studies of biodiversity values try to elaborate the values in several levels, which are extrinsic/instrumental values (human values), relational values (individual and collective) and

intrinsic values (Arias-Arévalo et al., 2017; Dasgupta et al., 2013; Piccolo, 2017; White, 2013). Consequently, there are different interpretations and methods for assessing the environment and biodiversity, which in our opinion can be grouped into two categories, as shown in Figure 1.

The first grouping is based on monetary values aimed to reveal biodiversity in the financial statements. Measurements methods in this group usually use a resource approach, including methods used by Jones (2003) and Jones (2010) using the natural inventory model to record and report on natural capital categories in the wildlife habitats, flora and fauna communities. Moreover, Freeman & Groom (2013) used a discount rate model to assess biodiversity from the perspective of shallow ecological policies (shadow environmental provisions), and Maseyk et al., (2016) used the disaggregated biodiversity offsetting in evaluating ecological equivalence by identifying and explaining all elements biodiversity and make adjustments to the impact of losses and gains on offset areas, i.e. areas where biodiversity treatments are implemented.

Other economic valuing bases are Total Economic Value (TEV) which includes use value and non-use value (Laurila-Pant et al., 2015). Use value or benefit value is the value of biodiversity due to its direct benefits utilization (for example the use of food, wood, medicines, etc.); indirect benefits (e.g. storm protection and carbon sequestration), and options value (the future benefits). Whereas non-use value includes existence value and bequest value.

The second grouping, the value of biodiversity is based on non-monetary measurements, which generally aim to explore all the values contained in biodiversity. This approach is an intrinsic value-based assessment, developed by several researchers, for example, Zhang et al., (2015) and Sheng et al., (2019), where they use the concept of Ecosystem Intrinsic

Value (EIV) in measuring objective values of ecosystems.

EIV is derived from the characteristics of ecosystems, the structure, processes, and functions of ecosystems. It is determined by the material, energy, and information of ecosystems. Therefore, EIV is the total material, energy, and ecosystem information. Furthermore, Kadykalo et al., (2019) and (Christie et al., 2019) used the concept of Nature's Contribution to People (NCP), where it uses the conceptual framework of the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES). It aims to assess ecosystems and biodiversity with a more inclusive approach in understanding and calculating value diversity. However, the value measured using the IPBES framework approach is specifically directed towards the instrumental and relational values of the NCP.

Other measurements use a more holistic value that was carried out by O'Connor & Kenter (2019), using the life framework of values model, which is considered a better approach because it can overcome the limitations of the NCP measurement model. Intrinsic value is seen as a unity entity together with the values of ecosystem services and NCP in the life framework. This is a framework of values that is innovative, comprehensive and easy to communicate, in which the use of this method is to do a combination / mixed between the NCP model and the life framework. There are four frameworks value built in this method, which are living from, living with, living in, and living as. The value of living from shows how to appreciate the world that contributes material and non-material to humans. This contribution can be in the form of utilizing natural resources for human needs, for example producing food, producing energy and best-learning practice taken from the environment. Moreover, living with implies that the planet is shared with humans

and non-humans, so it should be maintained and preserved.

The meaning of this value explicitly links biodiversity and conservation to carried out to manage the environment. While living in can be seen through the mapping on the non-material contributions of land and seascapes that can influence (both socially or physically) cultural, community and individual relations with a place, that forming and supporting cultural and personal identity. Also, living as reflects ideas and experiences about the world that show the mutual relationship between people and non-humans. In this perspective, a variety of spiritual experiences emerge regarding the unity created so that relational and intrinsic values are embedded.

The biodiversity assessment model is also used in several studies, for instance, Life Cycle Assessment (LCA) as in the research of (Lindner et al., 2019; Penman et al., 2010; Sizemore, 2015; Turner et al., 2019). LCA is a method used to assess environmental value chains and identify areas that are affected by the environment on a large scale. There are three objectives of using this method: First, to show areas that have potential environmental impacts as a result of the production process. Second, to identify the potential impacts that occur such as climate change, increase in CO₂ gas (acidification) and land use. Third, to improve the performance of environmental products (Lindner et al., 2019). The LCA assessment model framework is usually aimed at an area with large-scale temporal and spatial impacts, where the impact is estimated due to the transformation process of the resources used and emissions released by processes related to the production, utilization, and disposal of waste. Some researchers argue that this method is quite difficult because of the complexity of biodiversity at various scales and interactions, making it difficult to generalize within the LCA framework (Penman et al., 2010; Turner et al., 2019).

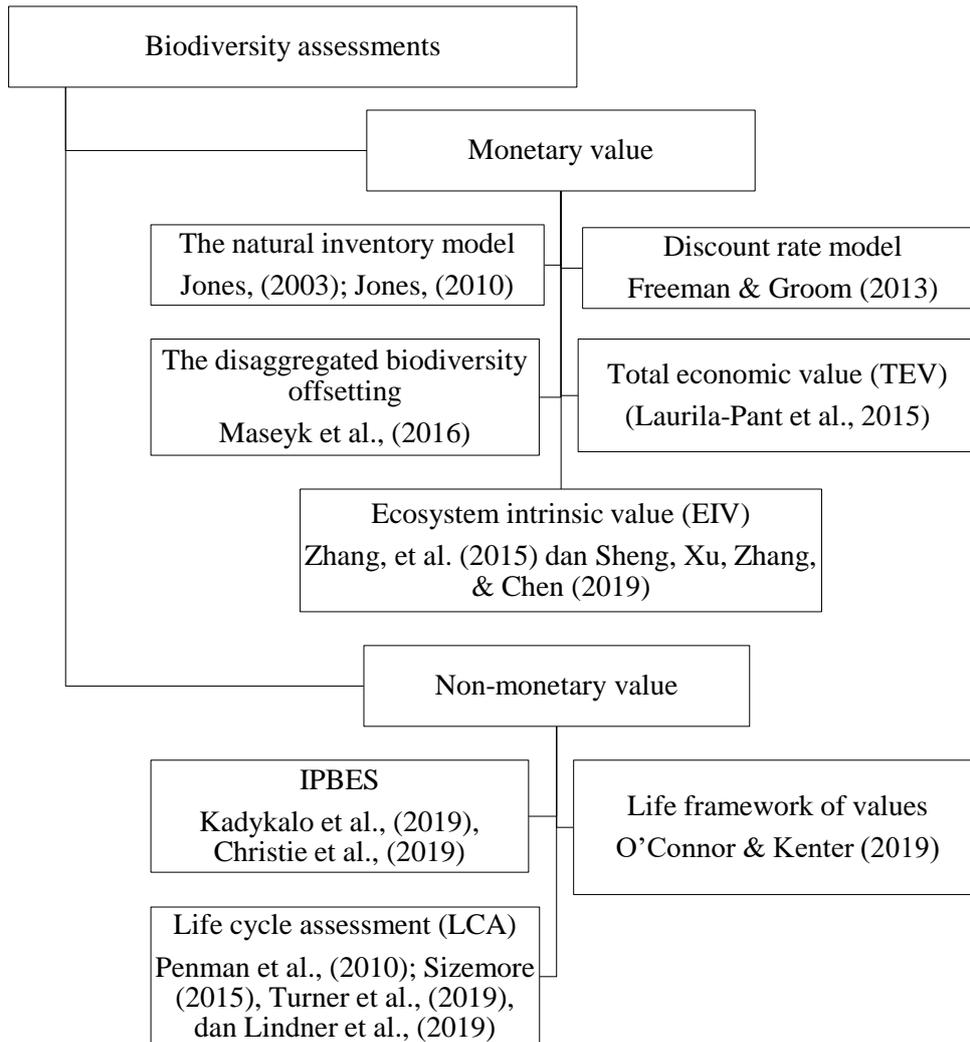


Figure 1 Biodiversity assessment methods (summarized from several former research)

5. Integration of intrinsic value in biodiversity accounting

As previously mentioned, the wider scope and various characteristics of biodiversity in Indonesia will have an impact on biodiversity disclosure. Therefore a conceptual framework for biodiversity disclosure is needed by integrating intrinsic values in biodiversity accounting. The framework we developed is Planning-process performance of ecology activity / P3FEA (Figure 2), adopting a biodiversity framework from the work of Samkin et al., (2014) which uses 3 (three) disclosure categories, at the level of strategic planning, process/implementation, and evaluation. The study was carried out at the department of conservation at the ministry of environment in

New Zealand with the conceptual framework referring to the literature of strategy and management performance.

The framework can also be used by other organizations whose operational activities have an impact on biodiversity, both as a guideline in biodiversity reporting and as a tool for stakeholders to assess biodiversity disclosure (Samkin et al., 2014). Although the method considered inappropriate when it is applied to organizations whose main purpose is to generate financial profits (Cuckston, 2018), the model is considered relevant to be implemented in organizations whose business activities have a strong relationship with the biological environment. For example, extractive industries

that cover the agriculture sector (food crops), plantations, livestock, fisheries, and mining (coal, oil & gas, other metals & minerals, rocks, etc.).

In line with the concept of intrinsic value in deep ecology developed by Naess (1973) aimed at overcoming critical environmental problems and biodiversity, the orientation of the conceptual framework of the P3FEA in Figure 2 starts from the policy impacting on the implementation of the deep ecology. This policy is regulation at the entity level derived from environmental regulation and the development of the main premise of intrinsic value which is the value associated with humans and other living things.

The value of biodiversity does not depend on its use for humans, thus its use must create harmonization of the benefits of biodiversity between humans and non-humans. Two things need to be considered by the entity, first, creating harmony means that the entity is performed wisely in utilizing the environment, not excessive, not selfish and not oriented towards economic values.

Second, the protecting behavior and preserving the environment is done solely due to the environment itself, where the premise built is that the environment is shared property with other creatures and the interdependence between humans and non-humans. Therefore, in the final stages in this framework, the biodiversity strategy is formulated and targeted according to the concept of deep ecology.

According to Samkin et al., (2014), five biodiversity strategy items can be developed by entities, first, the role organization in preserving its environment that is stated in the organization's vision and mission. The vision and mission are clearly stated specifically related to how entities play a role in creating and maintaining biodiversity sustainability. Second, describe the current status of biodiversity and issues affecting biodiversity. In this strategy, the entity describes the biodiversity conditions and environmental issues associated with these conditions that have

the potential for environmental performance in the future.

The scope of activities includes identifying the impact of entity activities on the balance of the biological environment. Third, describing the value and importance of biodiversity status, including the reasons for entities to carry out biodiversity restoration and maintenance.

The principle of biocentrism and self-realization in the deep ecology concept can be evaluated at the level of an entity's rationalization statement towards its ecological activities, even though subjectivity will lead to different interpretations. The biocentrism principle shows that entities view the environment as a source of life for all species, both human and non-human so that a balance is needed in their use.

The biocentrism principle imposes entities not only to focus on economic orientation in achieving their goals by over-utilizing natural resources. While the self-realization principle shows that entities have an awareness related to ecological values by placing biodiversity status as part of an ecosystem that is realized in a dynamic and balanced work program between economic, social and environmental factors. Fourth, identify the targets/goals/results/objectives that the organization has regarding the action plans, projects and research related to biodiversity. It aims to see and evaluate the extent to which planning activities and strategy implementation have a positive impact on biodiversity sustainability, and fifth is regarding the funding related to biodiversity.

Further development of biodiversity strategies is carried out in the form of actions or specific projects that are sustainable, participatory, responsive, and have social value (mutual benefit). At this level, biodiversity strategies implemented through programs and action plans that are sustainable for biodiversity should be captured by accounting as a responsibility item that provides information to stakeholders.

The measurements and assessments based on intrinsic value show that the value of biodiversity is recognized through the existence of non-humans as part of the environment so that the non-human existence is independent. The role of accounting in developing biodiversity accounting is not only related to assessment and reporting standards done by the entities in their activities to control the economic benefits of the biodiversity but also to assess and report the impact of the entity's business activities on biodiversity and non-human existence on biodiversity ecosystems.

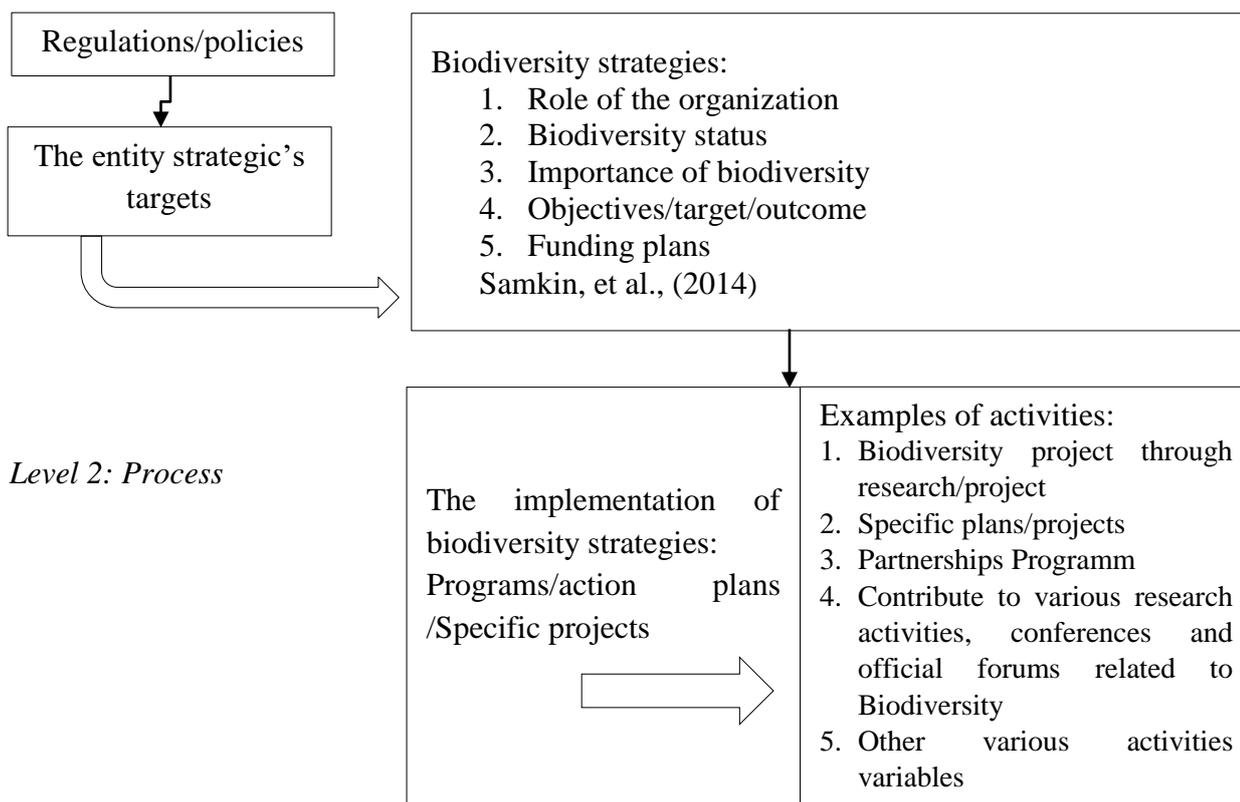
One of the weaknesses in accounting standards is its inability to describe the ecological activities of entities that have an impact on non-humans. This is confirmed by Ferreira (2017) who uses a case study approach using several data from various researches and supported by interviews with practitioners, regulators and non-government organizations in the UK, where it shows that the ecological activities of entities captured by accounting are only those related to the measurement of biodiversity offsets but unable to

calculate the important dimensions of biodiversity in the local political and cultural aspects. Besides, due to its complexity, it is considered impossible for biodiversity to be recognized as a commodity.

As a form of social accountability and stakeholder legitimacy, ecological disclosure based on intrinsic value assessment can be used as a basis for evaluating the ecological performance of entities and decision making. Assessing and disclosing biodiversity is not as easy as measuring and valuing physical accounts that are already clearly measured. However, several alternative biodiversity assessments have been developed by several researchers (Lindner et al., 2019; O'Connor & Kenter, 2019; Sizemore, 2015; Turner et al., 2019) by using the intrinsic value approach as an attempt to uncover the value of biodiversity in entity reports.

To be able to implement this valuation method it is necessary to take assessment steps so that they can measure, assess and disclose the ecological activities of the entity (figure 3).

Level 1: Ecology activities' planning



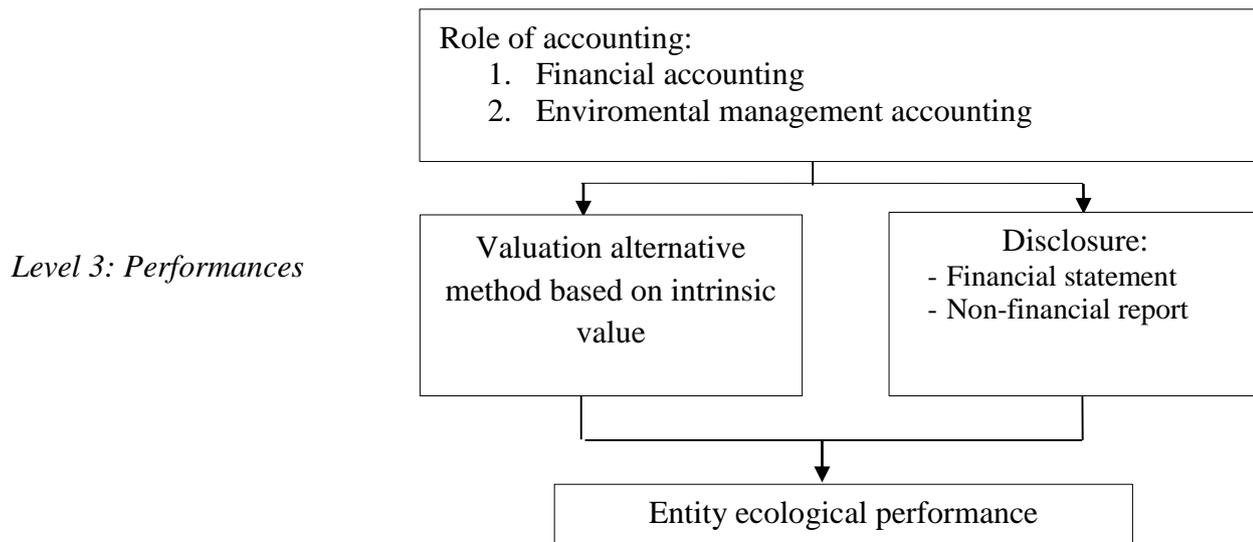


Figure 2. Planning-process-performance framework of ecology activity (P3FEA)

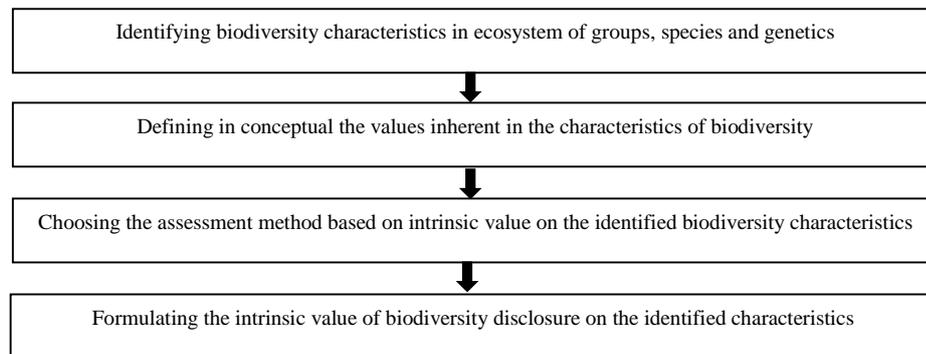


Figure 3. Step by step of the biodiversity valuation

6. Conclusions

Considering the increasing attention given by various parties to biodiversity issues and its reporting as well as the diversity of biodiversity characteristics have driven this study to develop the conceptual framework for biodiversity disclosure. Subsequently, the results of the literature review show that previous studies on the assessment and disclosure of biodiversity were carried out by different methods. Various valuation method references are given both monetary and non-monetary measurements with various approaches where one of them is intrinsic value. Intrinsic value with a deep ecology approach provides direction on how humans treat other living creatures (non-humans).

Although Naess (1973) does not clearly operationalize how to measure intrinsic value in the concept of deep ecology, the intrinsic value has been recognized as a biodiversity value that should be recognized and reported by the entity.

Therefore, the conceptual framework that we developed in this paper through the Planning-Process-Performance Framework of Ecology Activity (P3FEA) is a form of effort on how entities should reveal the intrinsic value of biodiversity at three levels. The first level is the disclosure of intrinsic value in ecological planning supported by the entity's vision and mission as a commitment to existing regulations. The second level, intrinsic value is generalized in the process of implementing specific actions and programs, and how the role of accounting in capturing the

biodiversity activities of entities in their interactions with non-humans. While the third level is evaluating the performance of entities using alternative measurement based on intrinsic values proposed by the literature.

The first level in the P3FEA framework shows that the entities carrying out ecological activities are driven by the entity's deep awareness of the meaning of the environment in which there are various living creatures live that are not only humans but also non-human beings. This commitment should be realized through a planning process that is derived from the vision and mission and strategic plans of the entity.

Furthermore, the second level shows that the intrinsic value contained in the first level is implemented through a tangible and measurable ecological activity program. Each entity may have a different program according to the biodiversity impacts caused by each entity. While the third level shows the implementation of the entity's ecological activities is valued by alternative methods of valuation based on intrinsic values that are appropriate for measuring how the ecological performance of the entity.

The limitations in this paper are first, the conceptual framework of intrinsic value integration is still theoretical framework and general in nature hence further development is needed by looking at the characteristics of industrial types, especially in industries whose operational activities have an impact on biodiversity. Moreover, the ecological activities will sometimes differ according to the type of industry, for instances the extractive industry will be different from the non-extractive ones. Second, some biodiversity assessment models within the intrinsic value framework offered by previous studies are also theoretical and tend to be difficult to measure and quantify, therefore in-depth case studies are needed for their implementation.

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