Proceeding Paper

Blue Accounting to Enhance the Quality of Sustainability Report †

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† Presented at the 5th International Conference on Vocational Education Applied Science and Technology 2022, Teluk Betung, Indonesia, 26–28 October 2022.

Abstract: Natural resources from the sea and the preservation of the maritime environment are the most important parts of developing a blue economy. Indonesia is a maritime country with an area of 6,400,000 km² of water. The sea is a source of Indonesia's assets, with fisheries sector revenues comprising around US$ 27 billion of the total GDP, supporting 7 million jobs, and providing 50% of domestic animal protein needs. The increasing demand for natural resources, including energy from the ocean, can provide new possibilities and challenges for creating sustainable marine ecosystems, and conserving marine natural resources. Indonesia needs to reform the management of the blue economy to increase investment contributions, in order to improve the governance of existing fisheries and marine ecosystems, including mangrove forests and coral reefs. We examine data on natural resources from the ocean and assets of the blue economy to determine a conceptual framework for accounting for the value of natural resource assets; this can be used to provide stakeholders with complete information about the potential of the blue economy, thereby strengthening the need for and protecting valuable natural resources for future generations.

Keywords: blue economy; ocean resources; blue accounting; marine ecosystem; blue economy assets

1. Introduction

Indonesia can be a country that builds infrastructure and manages its environment by utilizing the power of nature as its resource. In 2021, Indonesia had a cultivation fishery production target of around 19.47 million tons, consisting of 7.92 million tons of fish and 11.55 million tons of seaweed; this was an increase of 1.03 million tons from the 2020 production target of 18.44 million tons [1]. Indonesia has an estimated potential for fish resources, the number of allowable catches (JTB), and the level of utilization of fish resources, in its 11 regions, with a total estimated value of fish resource potential of 12.01 million tons per year with a JTB of 8.6 million tons per year [2].

Indonesia is only one of the maritime countries in the world. Complete data and information about marine ecosystems in the world can be obtained from [3]:

1. Marine Spatial Planning by assessing ecosystem resilience, the roles of various stakeholders, policies, and institutions.
2. Blue Natural Capital Accounting and Economic Analysis that identifies the value of blue natural resource capital or assets, and the other potentials for increasing income and employment, by calculating the distribution of current and potential benefits to people associated with the blue economy.

The marine ecosystem approach is the key to ocean sustainability and resilience. Information that describes the current state of ecosystems and seascape economies, as well as the specific policies, roles of stakeholders, and institutions that determine the use and design of the policies/institutional reforms needed to manage the transition to a Blue Economy. In addition, innovative financing is needed to implement these reforms.

The development of the marine aquaculture sector frequently relies on well-known opportunity discourses that highlight unrealized economic growth possibilities. This discourse also serves as the foundation for the more expansive idea of the Blue Economy, which places the ocean at the forefront of economic growth. Aquaculture is seen as a crucial component of the Blue Economy [4].

This information must show the value of the economic benefits from better blue natural asset management; how much revenue/rent potential is lost due to poor management; how much income could be increased through better management, including adaptation measures for climate change; could the fiscal costs of natural disasters be reduced by managing nature-based infrastructure for resilience; how many jobs and incomes increase with better management of the fishery; and who is affected by the policy changes.

The conceptual framework of accounting must provide the following useful information to blue economy stakeholders.

2. Methods

This research aims to account for the value of assets and natural resource capital in the blue economy in Indonesia, by collecting written data from various research paper sources, and utilizing fisheries' statistics. This research reviewed the literature to identify available evidence and data. Then, the data were reviewed and analyzed to propose a conceptual framework of accounting to measure the value of blue economy in Indonesia.

This research includes all articles about the blue economy and ocean, or blue accounting articles, published between 2010 and 2022, without geographical limitations.

3. Result

There are different terms used in several articles which focus on accounting in marine or sea contexts. Some articles use the term ocean accounting, and others use the term blue accounting. Blue accounting focuses on the life of marine ecosystems, which cover 72% of the entire planet Earth. Blue accounting has highlighted sustainability, which means meeting the needs of the present generation without forgetting the future generations [5].

The Ocean Accounts Framework adapted international statistical standards to perform measures of ocean accounting; these included the System of National Accounts (SNA), the System of Environmental Economic Accounting (SEEA), National Spatial Data Infrastructure (NSDI), and The Framework for the Development of Environment Statistics (FDES). The SNA provides various recommendations on how to compile monetary measures of economic activity, including a coherent, consistent, and integrated set of macroeconomic accounts. It summarizes economic processes, how production is distributed among consumers, businesses, governments, and foreign countries. The SNA account is one of the fundamental building blocks of macroeconomic statistics that forms the basis for economic analysis, and policy formulation for Ocean Accounts [6].

The reporting of ocean accounting cannot be separated from international commitments; seventeen Sustainable Development Goals (SDG) are aimed to be met by 2030, especially SDG 14 (life below water), SDG 15 (life on land which calls for the integration of ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies, and accounts by 2020), and SDG 17 (partnership for the goals, which calls for efforts building on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity building in developing countries by 2030) [7].

Ocean accounting or blue accounting reporting must also refer to the financial reporting conceptual framework. The basic conceptual framework, in accounting of financial reporting, includes definitions of an asset, a liability, equity, income and expenses, and guidance supporting these definitions: criteria for including assets and liabilities in financial statements (recognition), and guidance on when to remove them (derecognition); measurement bases and guidance on when to use them; concepts and guidance on presentation

and disclosure; and concepts relating to capital, and capital maintenance [8]. Researchers compile the conceptual of blue accounting in Figure 1.
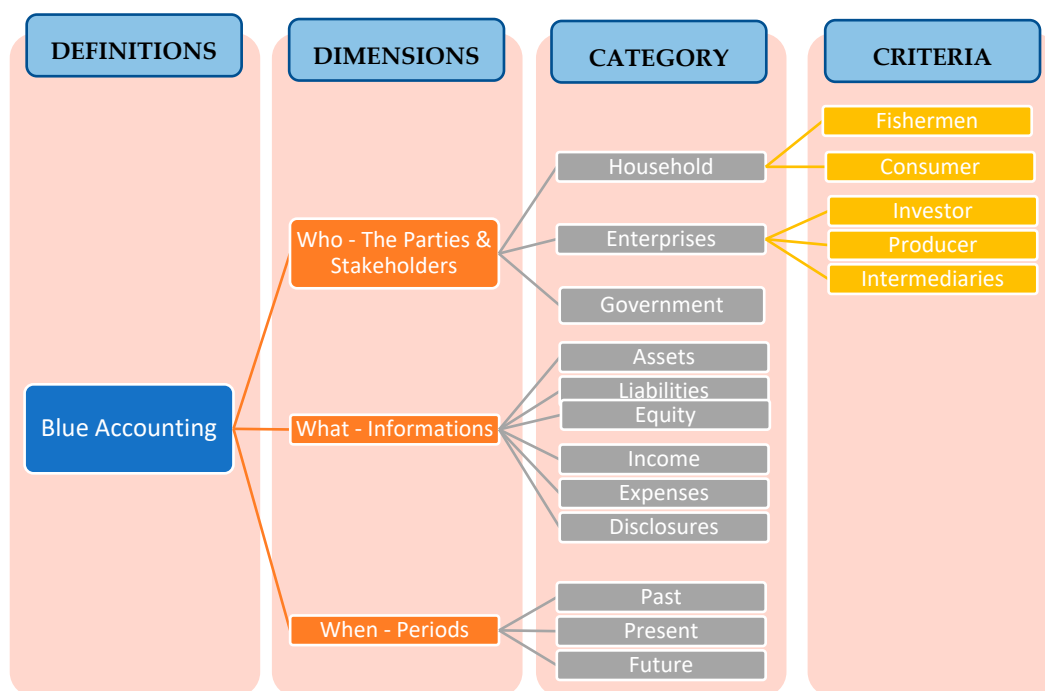

Figure 1. The concept of blue accounting.

This figure should be explained in more detail regarding how blue accounting can be interpreted into an accounting report. The key strength of blue accounting is data management, where the digital revolution is needed to change the way people interact with data. Blue accounting must use 'big data' and detailed business statistical data from various sources, so that research on blue accounting can be continued. However, the national blue accounting reporting must change the paradigm by using a revolutionary online digital dashboard, so that the data can be integrated in real time and be up to date. The other challenge of blue accounting focuses on how to disclose the three types of sustainability (SDGs) by providing a transparent and useful reporting framework for all stakeholders involved [9].

4. Discussions

The ocean must be fully measured in the digital system or 'big data' to enable decision-makers around the world to use the ocean's present day information to conserve, restore, or enhance it for the global future The complexity of the blue economy cannot be managed by one indicator alone. Complete information obtained by blue accounting includes three high-level key indicators, first is ocean products, changes in ocean balance, and ocean revenues in a period [10].

First, we discuss who the related parties or the stakeholders are in blue accounting. We divide them into three categories of parties related to blue accounting, namely households, government, and enterprises. Households consist of fishermen and consumers. The government is divided into two parties: the first party are those who make blue accounting reports, and the second party are those who make the policies and regulations for the blue economy. The enterprises is divided into three, the first is a company that acts as an investor, the second is a company that acts as a producer, and the third is a company that acts as an intermediary.

Marine ecosystems, as "integrated assets", recognize the ocean product, which is the ocean, as more than a source of fish; they recognize the importance of coastal protection, carbon sequestration, and climate regulation and recreation, including mangrove forests

and coral reefs. The ocean product is a part of the blue accounting assets. The funding from investors and creditors will change in the ocean balance sheet, while ocean income is generated from ocean productivity. The expenditure of blue accounting includes expenses for research and development, education, environmental protection, and expenses and maintenance for resource management. Stakeholders need other information that must be disclosed, especially about the SDGs (SDG 14, SDG 15 and SDG 17). Disclosure of information in blue accounting is very important. The components of the blue accounting form can be seen in Table 1.

Table 1. Components of Blue Accounting.

No.	Assets	Liabilities	Equity	Income	Expenses	Disclosures
1	Fishery	Fund from creditors	Fund from investors	Ocean Productivity	Research and Development	SDG 14 (Life under water)
2	Mangrove Forests				Education	SDG 15
3	Coral Reefs				Environmental protection and maintenance	SDG 17
4	Coastal					

Blue accounting reports are needed throughout the year, regardless of whether they are needed regarding current data, past data, or even future data. Therefore, a revolution in providing digital data is needed, so it can create big data in blue accounting.

5. Conclusions

Blue accounting is a new challenge for accountants around the world. Blue economy accountants are expected can compile ocean ecosystem data into financial reports, they also need to identify and reporting all blue economy calculations. As the ocean environment has significant changes, the accountants need to be a strategic role in an organizational, can quantify ocean big data in a blue economy. Blue accounting can be measured by the digital revolution of data.

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