Research Article

Green Taxonomy for Sustainable Production Across Countries

Atih Rohaeti Dariah, Asni Mustika Rani*, Popon Srisusilawati

Universitas Islam Bandung, Bandung, Indonesia

ORCID
Asni Mustika Rani: https://orcid.org/0000-0003-1405-5160

Abstract.

The green taxonomy plays a central role in driving developments in sustainable finance, leading to the achievement of sustainable production goals in various countries. While some countries have already adopted a green taxonomy, others are in the process of developing one. This study aims to identify the countries that have implemented sustainable finance in different forms and to conduct a content analysis to compare and identify gaps in their green taxonomy implementations. The research reveals that several countries worldwide have embraced the green taxonomy as a crucial tool in advancing sustainable finance and promoting sustainable production. These countries generally have specific environmental goals, establish green finance-related institutional arrangements and financial products, and compile lists of economic sectors and activities covered under the green taxonomy. Key sectors addressed by the green taxonomy include agriculture, energy, manufacturing industries, and transportation. However, each country still maintains its unique approach to environmental protection efforts through the use of green taxonomy tools.

Keywords: green taxonomy;,sustainable finance;,sustainable production

Corresponding Author: Asni Mustika Rani; email: asnimustika@unisba.ac.id

Published 30 October 2023

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the 5th Sores Conference Committee.

1. Introduction

Sustainable production has two important sides. First, as part of sustainable consumption and production (SCP) which is a link between other important goals and makes the Sustainable Development Goals (SDGs) a close and bound network [1]. Secondly, it is most important as source of sustainable economic growth [2].

Shifts in business and cultural patterns are indispensable in the institutional economic approach towards sustainable consumption and production [3]. In addition, innovation both from the operational and managerial side to the organizational structure for the market and the company needs to be an important concern[4]. All changes in the business and institutional environment will create a selective environment that supports the development of sustainable production and consumption [5], [6].

The firm's concern for sustainable production will form a green production pattern that can meet the requirements of the Green Taxonomy standard[7]. Green Taxonomy is a classification system based on environmentally friendly business or economic activities, which supports environmental protection efforts and climate change mitigation and adaptation [8]–[10]. The green taxonomy can also provide a better understanding and make it easier for financial services sector actors to classify green activities in developing a portfolio of financial services products [11].

Based on the results of a search on the experience of several countries in developing a green taxonomy, there are several countries that already have a green taxonomy and a number of other countries in the development process. This article will identify green taxonomy in several countries, how their similarities and differences.

2. Methods

With the nature of the research and accordance with the objectives, the method applied is content analysis as the data consist mainly of sustainable finance policies documents several countries. Content analysis is an effort of examining the meanings of the content of a form of information in the forms of document, poetry, painting, written speech, normative text or law [12]. It attempts to research ideas, concepts, and values of various thoughts that will be made into inference through efforts of finding the characteristics of messages, and it is done objectively and systematically. We identified main policies such as specific environmental goal(s), green finance-related institutional arrangements and financial products, list of economic activities, environmental contribution such as climate change mitigation, do no significant harm/DNSH, screening indicators

3. Result and Discussion

3.1. EU Taxonomy

The European Union is realizing its goal of becoming a climate-neutral continent through the adoption of the EU Taxonomy. EU Taxonomy is a classification system in the form of a list of environmentally friendly investment and economic activities for the European Union to help the European Union achieve the green deal that is being anticipated [13]. EU Taxonomy was created to provide a perception or common language for the word 'sustainable'. Moreover, EU Taxonomy provides companies and investors with a clearer definition of economic activities and investments that are considered environmentally

friendly and can help the EU reach a green deal. The basic principles for taxonomic design are specific environmental objectives, lists of economic activities, performance metrics, and performance thresholds (quantitative or qualitative). Through the implementation of the EU Taxonomy, investment and sustainable business are predicted to increase in a sustainable manner [14]. There are six environmental objectives within the scope of the EU's Sustainable Finance Taxonomy namely mitigation, adaptation, water & marine resources, circularity, pollution prevention, protection and restoration of ecosystems.

3.2. Climate Bonds Initiative

The Climate Bonds Initiative (CBI) is a non-profit international organization (Brazil, China, India and Mexico) that mobilizes global capital for best practice climate action, innovation in green and sustainable finance. The CBI workflow is divided into: 1) market intelligence; 2) develop reliable standards; and 3) provide policy models and suggestions. The nomenclature used is not the economic sector but assets or projects that support climate change management financially. Types of assets identified include transportation (passengers, transport and supporting infrastructure), buildings (commercial, residential and energy efficiency), land use and marine resources (agriculture, livestock, aquaculture industry (industrial and energy intensive processes), waste and pollution control (recycling, reuse and other waste management), and information and communication technology (networks, management and communication tools) [15].

3.3. Green Taxonomy in China

China is currently developing a Green Rating in an effort to substantially improve its environment. Intensive measures related to fiscal, taxation, financial measures were taken to optimize the allocation of resources and make China's economy as a whole greener and more sustainable [16]. The Green Rating is used to evaluate projects and companies externally regarding the positive and negative effects of the projects to be carried out and the business carried out by the company. This Green Rating will later be used as the basis for decisions to make fiscal subsidies or fines, cut bank interest rates and bond financing costs.

This allocation of capital to green industries plays an important role in China's institutional green transformation [17], [18]. However, Chinese banks do not yet have a consistent, reliable and comparable set of standards and methodologies for evaluating

green indicators for projects, business activities, and industry as a whole. The green indicators in question include evaluation of the impact of pollution, ecological, social, and sustainable use of resources.

The three main sectors related to energy and industry lead to a number of programs that encourage the growth of industries that are energy efficient, protect the environment and clean. Furthermore, sectors related to the environment and ecology include agriculture, fisheries, animal husbandry and marine programs. For the infrastructure sector, it includes green development construction programs, forestry.

3.4. Green Taxonomy in South Africa

The development of sustainable finance in South Africa is still relatively new. South Africa's first Green Finance Taxonomy (GFT) was first launched by the National Treasury (NT) in April 2022. The GFT concept is the same as green taxonomy in other countries, namely in the form of an official classification that shows eligibility for the "green" or friendly category. environment of a project, company, sector or industry. This GFT initially focused on climate change mitigation efforts, but is expected to be expanded in scope to address other issues such as biodiversity and land use. This is the focus of further development of the GFT to build the basis for the development of a larger and more comprehensive taxonomy for environmental objectives relevant to South Africa's green economy as presented in Figure 1. GFT is a key mechanism to encourage increased investment in the green economy to support green industries, sustainable finance, and SDGs [19].

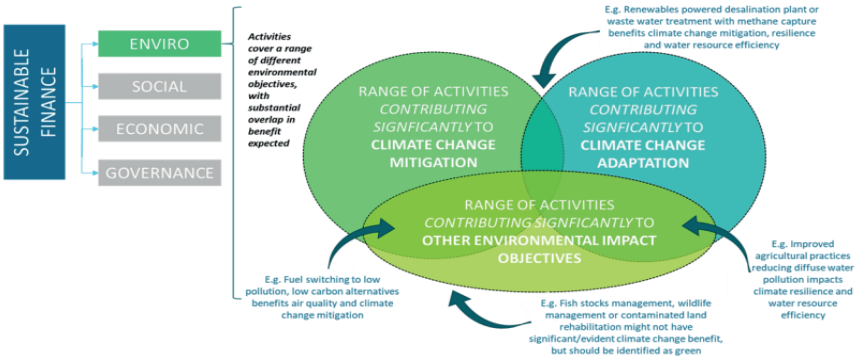

Figure 1: Scope of activities with environmental benefits.

3.5. Green Taxonomy in Malaysia

The impact of climate change on business and the economy of the people in Malaysia is starting to be realized so that it becomes the government's urgency to accelerate the economic transition to a low-carbon economy. Malaysia initiated discussions on the assessment and classification of economic activities that contribute to climate change mitigation and adaptation by financial institutions in 2019. The discussion, consultation and policy-making process involved Bank Negara Malaysia (BNM), financial institutions, asset management companies, rating agencies and agencies nongovernmental. Financial institutions will later channel capital and funds through green financing schemes to projects, companies and industrial sectors that have been deemed feasible.

In 2021, BNM published the Climate Change and Principle-based Taxonomy (CCPT) which is a Guiding Principle (GP) for Financial Institutions (FI) to assess and categorize economic activities (Climate Supporting, Transitioning and Watchlist). Table 1 shows the classification of economic activities in Malaysia [20].

Table 1: Classification of Economic Activities in Malaysia.

Classification		Economic Activity (Transaction Level)		Overall Business	
		GP1Climate Change Mitigation	GP2Climate Change Adaptation	GP3No Significant Harm to the Environment	GP4Remedial Efforts to Promote Transition
Climate Supporting	C1	GP1 or GP2 or both		✓	
Transitioning	C2	GP1 or GP2 or both		x	✓
	C3	x		x	✓
Watchlist	C4	GP1 or GP2 or both		x	x
	C5	x		x	x

Examples of Activities That Generally Meet GP1 such as Energy Efficiency, Transportation, Green Technology/Manufacturing, Renewable Energy, Waste Management, Agriculture, Forests and Land Conservation. Examples of Activities That Generally Meet GP2 such as Forestry, Fisheries, Agriculture, Water Resources, Construction, Coastal Areas, Health, Information and Communication, Transportation [21].

3.6. Green Taxonomy in ASEAN

ASEAN financial sector bodies jointly form the ASEAN Taxonomy Council (ATB) to develop policies for the development of the ASEAN Taxonomy. ATB consists of representatives of each country in ASEAN which is a financial institution, namely Brunei

Darussalam Central Bank, Monetary Authority of Singapore, Non-Bank Financial Services Authority (NBFSA) of Cambodia, Financial Services Authority of Indonesia, Bank of Lao PDR, Bank Negara Malaysia , Ministry of Planning and Finance of Myanmar, Philippines Insurance Commission, Bank of Thailand, and State Securities Commission of Viet Nam.

ASEAN Taxonomy version 1 has been launched as a reference to guide the provision of funds and capital to economic activities that can assist the systemic transformation that each region in ASEAN needs. The ASEAN taxonomy is structured based on a multi-tiered approach with two main elements, namely the Foundation Framework in the form of a qualitative assessment of economic activities, and the Plus Standard in the form of metrics and thresholds to meet the requirements and benchmarks specified for green activities and investments [22].

Table 2: Plus Standard Process in ASEAN Taxonomy.

Category	Activities
Green	Energy: renewable energy, energy storage systems, etc Transport: zero tail pipe emissions micro-mobility and transport, zero emission transport, etc Manufacturing: low/zero carbon technologies, etc Construction and buildings: installation of specific low/zero carbon technologies, etc Water, waste and other remediation: carbon capture, utilisation and storage, efficient wastewater, etc
Red	Energy: coal or oil power, waste heat recovery, coal mining or oil extraction, etc Transport: new roads, road bridges, road upgrades, oil tankers or other ships solely transporting coal, etc Waste: landfill without gas capture, etc

Table 2 shows the list of green and red activities in ASEAN Taxonomy, and the list will continue to be reviewed and developed in the next green taxonomy.

3.7. Indonesia Green Taxonomy

The Financial Services Authority officially launched the Indonesian Green Taxonomy in 2022 which will be used as a guide in supporting the development of a green economy in Indonesia and as a reference for ministries and other financial institutions in providing incentives and disincentives for economic activities. Indonesia is the second country in ASEAN after Malaysia to issue a green taxonomy document. The content of this guideline is not much different from the guidelines that have been prepared in several other countries such as the EU Green Taxonomy.

There are three classification criteria in the green taxonomy, namely: 1) green (do no significant harm, apply minimum safeguard, provide positive impact to the environment,

and align with the environmental objective of the taxonomy, 2) yellow (do no significant harm), and 3) red (harmful activities) [23]. The green taxonomy plays an important role in helping to increase sustainable investment and as an effort to accelerate financing programs. Implementing a green taxonomy will create security for investors, protect private investors from green laundering, help companies become more climate friendly, reduce market fragmentation and help divert investment where it is needed most. The Green Taxonomy sets out six environmental objectives, namely: 1) climate change mitigation, 2) climate change adaptation, 3) sustainable use and protection of water and marine resources, 4) transition to a circular economy, 5) pollution prevention and control, and 6) protection and restoration of biodiversity and ecosystems.

4. Conclusion

A number of countries in the world have implemented green taxonomy as a tool in implementing sustainable finance towards sustainable production. In general, the sectors covered by the green taxonomy are agriculture, energy, processing industry, transportation. However, each country still has its uniqueness in environmental protection efforts through green taxonomy tools. The Green Taxonomy in each country is a living document that is openly adjusted continuously, both related to the development of classifications and the entry of new business activities. The green taxonomy is expected to accelerate the implementation of sustainable finance in the world.

Acknowledgments

This research was supported by Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM), Universitas Islam Bandung. We thank reviewers for their so-called insights, comments on an earlier version of the manuscript, although any errors are our own and should not tarnish the reputations of these esteemed persons.

References

[1] Le Blanc D. Towards integration at last? The sustainable development goals as a network of targets. Sustainable Development (Bradford). 2015;23(3):176–187.

[2] Hepburn C, Stern N. “Driving investments toward sustainable economic growth in the People’s Republic of China,” 2019. https://doi.org/10.22617/WPS190459-2.

[3] Dariah AR, Abdullah R, Hidayat AR, Matahir F. Sustainable economic sectors in Indonesia and Brunei Darussalam. Sustainability (Basel). 2022;14(5):1–20.

[4] Kharchenko V, Illiashenko O. "Concepts of green IT engineering: Taxonomy, principles and implementation," Green IT Engineering: Concepts. Models, Complex Systems Architectures; 2017:3–19.

[5] Bradley P. An institutional economics framework to explore sustainable production and consumption. Sustainable Production and Consumption. 2021;27:1317–1339.

[6] Rani AM, Yuliawati T, Agustiningsih DD. "How to change MSME's Paradigm in applying green industry principles?" Proceedings of the Social and Humaniora Research Symposium (SoRes 2018), 2019. https://doi.org/10.2991/sores-18.2019.56.

[7] Debbarma J, Choi Y. A taxonomy of green governance: A qualitative and quantitative analysis towards sustainable development. Sustain Cities Soc. 2022;79:103693.

[8] Hazarika N, Zhang X. Evolving theories of eco-innovation: A systematic review. Sustainable Production and Consumption. 2019 Jul;19:64–78.

[9] Network for Greening the Financial System, "Enhancing market trasnparency in green and transition," 2022.

[10] World Bank Group, "Developing a National Green Taxonomy: A World Bank Guide," 2020.

[11] Ehlers T, Gao D, Packer F. A taxonomy of sustainable finance taxonomies. SSRN. 2021;(118): https://doi.org/10.2139/ssrn.3945635.

[12] Busch C et al., "Content Analysis," The WAC Clearinghouse.

[13] European Parliament and the Council. Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088. Official Journal of the European Union. 2020;63:13–43.

[14] Gallagher E, Bancilhon C, Berruti G. What you should know about the EU Taxonomy. GreenBiz; 2021.

[15] Climate Bond Initiative, "Climate Bonds Taxonomy," 2021.

[16] OECD, "Industrial upgrading for green growth in China," 2017.

[17] Yuan Q, Yang D, Yang F, Luken R, Saieed A, Wang K. Green industry development in China: an index based assessment from perspectives of both current performance and historical effort. Journal of Cleaner Production. 2020;250:119457.

[18] Shen Y, Faure M. Green building in China. International Environmental Agreements: Politics, Law and Economics. 2021;21(2):183–199.

[19] National Business Initiative, “Developing a national green taxonomy: Project briefing report,” 2020.
[20] Bank Negara Malaysia, “Climate Change and Principle-based Taxonomy,” 2021.
[21] Bank Negara Malaysia, “Climate Change and Principle-based Taxonomy,” 2021.
[22] ASEAN Taxonomy Board, “ASEAN Taxonomy for Sustainable Finance,” 2021.
[23] OJK, “TAKSONOMI HIJAU INDONESIA Indonesia Green Taxonomy,” 2022.