

1999-2022: 30 Key Initiatives of Sustainability from Taiwan

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Abstract

This paper presents a comprehensive macro-environment analysis through a political, economic, social, and technological (PEST) analysis approach. This paper aims to help the international community to understand Taiwan's Progress in realizing Sustainable Development Goals and share its initiatives. A total of 30 sustainability initiatives were drawn from the twenty-four reports published by the National Council of Sustainable Development (NCSD) in Taiwan between the years 1999 to 2022. This paper's findings show Taiwan has shaped the growth momentum in sustainable development and could be a benchmark for other countries.

Keywords: Macro-environment, PEST Analysis, Sustainability Initiatives.

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DOI: <https://doi.org/10.21834/e-bpj.v9iS117.5450>

1.0 Introduction

Over the past decade, Taiwan has fervently embraced sustainable development as a central tenet of national policy, aligning with the UN Sustainable Development Goals. Initiatives began in 2016, with the formulation of Taiwan's own Sustainable Development Goals, aiming to enhance mechanisms for sustainable development, engage globally, and address local needs. The government introduced an ambitious set of 18 goals and 143 targets in 2018, complemented by 336 indicators in 2019. In November 2019, the Guidelines for Following Up and Assessing Progress Toward the Sustainable Development Goals were enacted to monitor advancements.

In response to the UN's call for regular reviews, Taiwan released its initial report in 1999, followed by the first Voluntary National Review in September 2017. These reports elucidate Taiwan's strategies, encompassing digital innovation, inclusive green growth, social inclusion amid an aging population, and proactive measures for net-zero emissions by 2050. Recognizing the pivotal role of local governments, the study emphasizes their crucial role in implementing sustainable development practices, echoing the efforts documented by the National Council of Sustainable Development (NCSD) between 1999 and 2022. The study seeks to foster an international understanding of Taiwan's progress and initiatives toward realizing Sustainable Development Goals, analyzing 24 NCSD reports to fulfill the study objectives.

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2.0 Literature Review

2.1 Concept of Sustainable

The most commonly defined sustainable is "meeting the needs of the present without compromising the ability of future generations to meet their needs" (WCED, 1987). This definition has a very broad scope and makes sustainability a concern to every human and natural world. Sustainability has been observed as a concept, process, and goal.

This study attempts to maintain a holistic interpretation of sustainability and considers it within the environmental, social, and economic dimensions. Recognizing sustainability in these three domains is consistent with the three pillars of sustainable development:

- i. **The environmental:** contribution of both the economic and the social and their effect on the environment and its resources
- ii. **The social:** human rights and values, relationships, and institutions.
- iii. **The economic:** allocation and distribution of scarce resources

These three pillars of sustainable development emphasize the links among these three dimensions, their long-term complementarities, and the need for balancing them when conflicts arise in the short term. A simplified representation of some of the links between the social, economic, and environmental dimensions of sustainable development is provided in Fig. 1. (OECD, 1999).

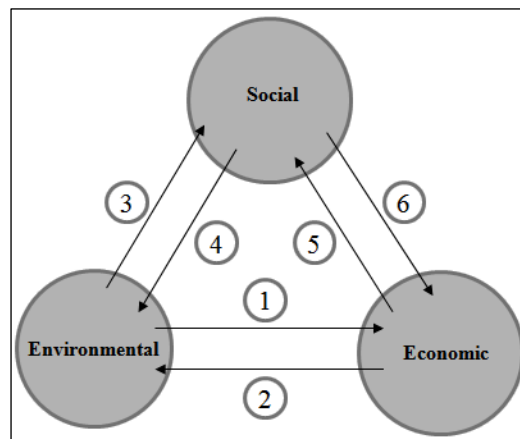


Fig. 1. Interaction between Economic, Environmental, and Social (OECD, 1999)

Sustainable development is a dynamic concept. It is not about society reaching an end state, nor is it about establishing static structures or identifying fixed qualities of social, economic, or political life. Promoting sustainable development is an ongoing process, whose desirable characteristics change over time, across space and location, and within different social, political, cultural, and historical contexts. The Brundtland Commission realized in 1987 that "compartments have begun to dissolve. This applies to the various global 'crises' that have seized public concern.... These are not separate crises: an environmental crisis, a development crisis, or an energy crisis. They are all one" (WCED, 1987).

2.2 PEST Analysis

PEST analysis is used as a tool for situational analysis and is one of the most used models in the evaluation of the external environment. The tool allows the assessment of the current environment and potential changes. It can also be used for identifying current or possible future challenges, allowing for effective planning of how to best manage these challenges. The PEST Analysis is an acronym for Political, Economic, Social, and Technological (Deirmentzoglou & Deirmentzoglou, 2022). The details are explained below (Abdoh et. al, 2020).

- i. **Political Environment:** PEST Analysis is used to examine how the external environment is affected by the political environment. The analysis can generate results on the political situations on whether there is political stability or climate.
- ii. **Economic Environment:** PEST Analysis generates data on the economic situation in terms of tax, tariffs, interest rates, economic growth, inflation rate, exchange rate, minimum wage, wage rates, unemployment, cost of living, working hours, credit availability, financing availability, level of economic growth.
- iii. **Social Environment:** The social environment includes the values, beliefs, attitudes, opinions, and lifestyles of stakeholders. Social beliefs, values, and lifestyles influence society. The analysis of demographic factors includes the study of the human population regarding size, geographic distribution, age, education levels, and income distribution.
- iv. **Technological Environment:** The technological environment focuses on the specific roles of technological advances within the industry.

3.0 Methodology

Documents analysis was employed to analyze twenty-four reports published by the National Council of Sustainable Development (NCSD) in Taiwan between 1999 and 2022. The reports include 22 Annual Reports on National Sustainable Development and 2 Taiwan's Voluntary National Review. For this study, content analysis was used, and twenty-four reports were selected based on their relevance

to sustainable development in Taiwan since the function of NCSD is to integrate sustainable development-related work in Taiwan, and the reports published by this council can represent the sustainable development of the macro-environment in Taiwan.

This study has employed a content analysis framework proposed by Krippendorff (2004) (Fig.2). The analysis employs a political, economic, social, and technological (PEST) approach to develop an understanding of the sustainable development in Taiwan in helping companies in Taiwan to build a better vision of the future business landscape and how the industries might achieve sustainability.

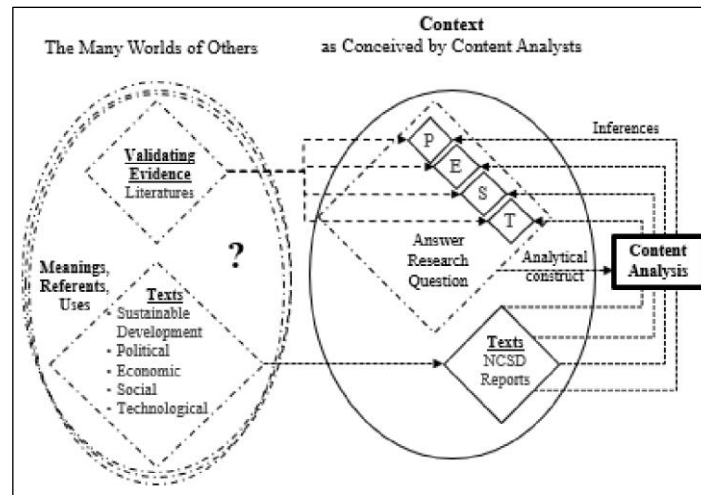


Fig. 2. Framework for Content Analysis
Sources: Modified from Krippendorff (2004)

4.0 Findings

Content analysis was employed to analyze the reports based on the four elements of the PEST analysis model: political, economic, social, and technological. A total of 30 sustainability initiatives taken by the government of Taiwan were identified. These initiatives are listed below.

Table 1. 30 Sustainability Initiatives

9 Political Sustainability Initiatives	
1	Promotion and implementation of Sustainable Development Vision, act and policy and regulation
2	Implementation of Sustainable Development Action Plan, Strategies, and directions
3	Revise Sustainable Development Mechanisms, measures, and standard
4	Amendment to the Sustainable Development related Guidelines, system, and framework
5	Promoting sustainable urban development and smart cities
6	Developing smart government
7	Promoting open government and transparent governance
8	Reform of the pension system
9	Increase in the minimum wage
8 Economical Sustainability Initiatives	
1	Promoting Green Management
2	Promoting Eco-tourism
3	Promoting Green Product
4	Promoting Green Consumption
5	Promoting Green Building
6	Promoting the green energy industry
7	Promoting prevention measures and stimulus packages to enable inclusive economic growth and education
8	Promoting innovative growth and developing a digital economy
11 Social Sustainability Initiatives	
1	Life and Education
2	Increase public awareness by expanding participation
3	Quality of Living Environment
4	Sustainable Practices
5	Sustainable Transportation
6	Health and welfare
7	Strengthen social care services
8	Preserving Culture and Heritage
9	Promoting gender equality
10	Promoting regional revitalization and rural development
11	Promoting Indigenous Sustainable Development
2 Technological Sustainability Initiatives	
1	Promoting Sustainable Development Research and Development

To summarize the findings of this study, it could be concluded that all initiatives taken by Taiwan cover 8 areas (Fig.3), such as Health and Welfare, Life and Education, Green Economy, Green Transportation, Natural Resources, and urban and Rural development. Sustainable agriculture and biodiversity, environmental quality and Climate changes, energy conservation, carbon reduction, and nuclear-free homeland promotion.

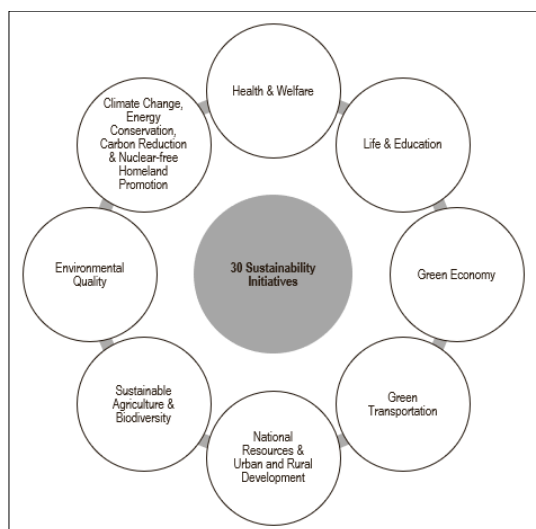


Fig. 3. 8 Focus Areas of Taiwan Sustainable Initiatives

5.0 Discussion

5.1 Political

Since 1999, Taiwan has taken 9 sustainability initiatives, employing a dual "top-down" and "bottom-up" approach in governance planning and analysis (NCSD, 2004). The Agenda 21 National Report on Biodiversity and the National Environmental Protection Plan have evolved into foundational sustainability guidelines, extending from the central government to localities. This visionary framework encompasses mechanisms, strategies, guidelines, acts, policies, plans, systems, and action plans for national and local sustainable development (NCSD, 2000; 2005; 2015; 2016; 2017; 2020; 2021). Initiatives range from fortifying disaster prevention (NCSD, 2006; 2012) to formulating preventive measures for international high-risk invasive species (NCSD, 2007).

Commencing with e-government in 1996, Taiwan advanced towards smart governance and cities, leveraging data for a collaborative public-private model (NCSD, 2021; 2022). To enhance transparency and public participation, the Open Government National Action Plan Taskforce was established in 2020 (NCSD, 2022), signaling Taiwan's commitment to the Open Government Partnership (OGP).

Addressing national fiscal sustainability and generational justice, Taiwan initiated pension reform on May 30, 2016, recognizing challenges from an aging society, declining birth rates, and wage issues (NCSD, 2017).

5.2 Economical

The government of Taiwan has embarked on eight pivotal economic sustainability initiatives, strategically responding to the imperative of enhancing green competitiveness, aligning with international environmental standards, and fortifying global competitiveness since its accession to the WTO in 2006 (NCSD, 2006). These initiatives encompass the proactive promotion of the green business concept, offering guidance, environmental protection committees, training courses, and research plans aimed at fostering environmentally friendly packaging practices (NCSD, 2006; 2000; 2018).

Aiming to mitigate environmental damage resulting from misconceptions about ecotourism, Taiwan drafted the Ecotourism White Paper in 2004, reflecting a commitment to sustainable tourism practices in the face of a surge in tourist activities directly engaging with natural ecology (NCSD, 2005). With a focus on sustainable agriculture, the government advocates for the consumption of Taiwan's renowned tea and facilitates the establishment of rice marketing zones, implementing planting management, and promoting safe pesticide usage, including the introduction of a third-party certification system (NCSD, 2011).

Furthering the commitment to green consumption, Taiwan has established marketing channels, a carbon labeling system, and reinforced green procurement practices in both public and private sectors (NCSD, 2012; 2017; 2000; 2002; 2011). The integration of green building codes into construction regulations highlights the government's dedication to advancing sustainable practices, particularly in existing structures (NCSD, 2008; 2014). Moreover, certain counties and cities are diversifying traditional agriculture by incorporating advanced technology, culture, tourism, and manufacturing, fostering sustainable ecological development (NCSD, 2000, 2001; 2002; 2005; 2009; 2017; 2019; 2020; 2021).

Leveraging big data and digital technologies, Taiwan effectively manages disease spread through the national health insurance database, showcasing adept public health control measures (NCSD, 2022). Since 2017, the government has prioritized economic

growth, focusing on innovation, employment, and fair distribution as core values, marked by increased investment, structural reforms, and innovation as pivotal drivers (NCSD, 2015; 2016; 2018; 2020; 2022).

5.3 Social

The government of Taiwan has taken 11 social sustainability initiatives, embodying a commitment to holistic development (Table 1). Noteworthy efforts include the formulation of the "Environmental Education Act" to integrate resources and promote sustainable development education (NCSD, 2005; 2006; 2007; 2012; 2013; 2019). Schools' life cycles have been transformed into bases for environmental education in alignment with sustainable development principles (Shih et al., 2013) (NCSD, 2016; 2021).

Civil society involvement has been integral to the entire process of sustainable development, fostering a comprehensive educational network through schools, workshops, and courses that integrate communities (NCSD, 2017; 2019). Environmental quality management, monitoring, and guidelines for pollutant monitoring underscore the commitment to a safe, healthy, and clean environment (NCSD, 2019, 2020; NCSD, 2005; 2009; 2013; 2019).

The government has prioritized public transportation improvements to enhance community life, implementing plans to address public transport challenges (NCSD, 2010-2020). Comprehensive medical services, long-term health information, and welfare initiatives reflect a focus on public health, disadvantaged individuals, children, women, and the elderly (NCSD, 2001, 2018, 2021). Social protection for the aging population and a Ten-Year Hospital Plan for disabled elderly individuals demonstrate the commitment to elderly care (NCSD, 2013; 2017; 2014; 2017). Moreover, initiatives to preserve cultural assets and achieve transitional justice for indigenous peoples highlight the government's dedication to preserving local identities, aiding community sustainability, and recognizing the diverse cultures of Taiwan (NCSD, 2018; 2000; 2017).

5.4 Technological

The government of Taiwan has implemented two impactful sustainability initiatives in technology, focusing on research and development for technological advancement (NCSD, 2000; 2015; 2016; 2018; 2020). Beyond this, efforts include promoting distributed renewable energy generation, parallel connection technology, and enacting statutes for renewable energy development (NCSD, 2007; 2013). A research and development plan has been devised for biomass raw materials, utilizing microbial stabilizer technology for biodiesel fuel promotion. Concurrently, initiatives include maritime historical research and the preservation of Dongsha Marine National Park, enhancing techniques for maritime historical research and underwater archaeology (NCSD, 2009). Additionally, Taiwan established the Taiwan Biodiversity National Information Network (TaiBNET) to compile databases for biological species and biodiversity specialists (NCSD, 2017). Digitizing various information into an integrated Internet database facilitates academic exchange and practical application, reinforcing the outcomes of foundational academic research (NCSD, 2004; 2009; 2011; 2013; 2015; 2016; 2019; 2020). Prototype planning and the establishment of a nationwide ocean database have further solidified these technological sustainability efforts (NCSD, 2019).

6.0 Conclusion and Recommendations

In conclusion, Taiwan's comprehensive sustainability strategy encompasses environmental, social, and economic dimensions, fostering holistic and inclusive development. The country, after implementing eight significant economic sustainability measures, proactively addresses green competitiveness, global environmental concerns, and industry competitiveness post-WTO accession. Socially, Taiwan's approach emphasizes education, community involvement, environmental quality, health, welfare, cultural preservation, and justice for indigenous peoples, collectively contributing to societal resilience and equity. Additionally, two notable technology-related sustainability initiatives highlight the government's commitment to multifaceted advancements, covering research and development, renewable energy, biodiversity conservation, and maritime preservation. These efforts underscore Taiwan's dedication to leveraging technology for sustainable development, reinforcing a commitment to ecological balance and resilience in the future.

Taiwan's holistic sustainability approach across politics, economics, social development, and technology suggests key recommendations: 1) Establish international collaborations for impactful initiatives; 2) Enhance public engagement in decision-making; 3) Integrate sustainability into policymaking; 4) Support innovation in sustainable technologies; 5) Implement robust monitoring and evaluation mechanisms. These insights offer valuable directions for future research.

Acknowledgments

The authors would like to express their gratitude to Universiti Teknologi MARA (UiTM) Shah Alam Selangor, Malaysia, for their assistance and ReNeU UiTM for the publication incentive provided through PYPB and MEE 3.0 Programs.

Paper Contribution to Related Field of Study

This paper makes a substantial contribution to the field by combining a robust analytical framework with a rich dataset, offering insights into Taiwan's sustainability journey, and proposing the country as a potential benchmark for others. This can inform future research, policy decisions, and international collaboration in the realm of sustainable development.

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