How to Achieve Environmental Sustainability through Manpower Policy?

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ABSTRACT

Achieving a good quality and sustainable living environment is the main dream of every country and at the same time becomes a barometer for achieving high economic growth. On the other hand, many institutions (such as like: the European Environment Agency (EEA) and Asian Environmental Compliance & Enforcement Network (AECEN)) were established only aimed to maintain a quality environment. Human resources have an important role in protecting the quality environment, then every related entity (government, corporation, or non-government organization) must also have a concern for this resource issue. Therefore, this study aims to determine what factors can be used by the government to improve the capacity of human resources and at the same time achieve quality and sustainable environmental goals. This study used the Systematic Literature Review (SLR) method with the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) flow chart analysis tool. The databases used in this research are Scopus and Web of Science and use Publish or Perish (PoP) to search for articles with certain keywords. Furthermore, this study also used several qualitative research tools (such as VOSviewer and NVivo), to further analyze each eligible article generated from the database. The main finding of this study is that education plays an important role in achieving environmental sustainability, so the government should focus more on creating a sustainability mindset and developing human capital.

Keywords*: Environmental Sustainability, Manpower, Education, Systematic Literature Review*

INTRODUCTION

Rapid economic growth is real potential in degrading environmental quality [1]. Many studies have concerned this issue so that while enhancing economic growth, environmental quality should also be concerned. The concern about environmental quality is centered since Conference on Environment and Development (UNCED) in 1992[2]. The seventeen goals of Sustainable Development have spread across disciplines and environmental issue is one other goal that should be achieved. So that issue is also extremely concerning by the government (EEA, AECEN, and so on) over the world to achieve their goals strategically. As we know, humans play a significant role to achieve this goal either by enhancing economic growth or by keeping the environment healthy. Becker (1992) stated that human capital is important to promote economic growth and a strong position in the international market.

Not only for economic growth, but human capital is also crucial for keeping the environment healthy [3]. Ahmed et al. (2020) conclude that urbanization and economic growth are definitely degrading environment quality, but human capital can mitigate and alleviate this deterioration [4]. Moreover,

Sarkodie (2018) also argues that human activities (mining, deforestation, chain saw operations, and so on) are the major causes of natural habitat destruction and also affect air pollution [5]. Armeanu et al. (2018) also show in their study that human capital plays a significant role to promote sustainable economic growth [6]. One of the entities which have responsibility is the government. They are playing a significant role to drive every economic entity to keep this world healthier. Every country has different characteristics such as demographic structure, culture, political systems, economic systems, etc. So that the governments in each country should have their best policy to settle this issue. Therefore, this study aims to know what factors can be used by the government to achieve higher economic growth without degrading environmental quality. The methods used (Systematic Literature Review) will be the main novelty in this study that differs from the previous such as Tsai (2012), Wen Lee et al. (2019), and so on.

LITERATURE REVIEW

The productivity of human resources is an essential factor for economic growth [7]. Moreover, the higher the human resources experience, the higher wages will get, so the cost should be viewed as an investment [8]. Schultz (1960) mentioned that education can be viewed as an essential part of human capital [9]. However, human capital is not only to pursue long-run economic growth but also plays a significant role to protect the environment to promote sustainability [10]. The issue has an equal consideration with economic development globally. In Taiwan, it forces the government to pursue a public policy in education [11]. Public policy aspects are essential because the government can make society follows its instructions forcefully [12]. By definition, public policy means that everything government decides to act or not [13].

Cochran and Malone (1995) argue that public policy is a political decision that is to be implemented for several social goals [14]. So that every policy produced by the government should give more benefit to society and achieve its efficiency and effectiveness, especially for the environmental issue. For example, the environmental policy which has been implemented by the Taiwan government to achieve sustainability are: (i). Making an action plan and coordination with the other stakeholders; (ii). Providing funds for environmental education; (iii). Doing environment campaigns, seminars, promoting the environmental handbook, environmental research, and so on; and (iv). Certification for environmental education institutions and every environmental education personnel [15]. It implies that governments have a significant role to promote environmental issues, especially in education. The innovation mindset of human resources will encourage the institution or organization to recruit, train, and develop for achieving environmental sustainability through renewable energy consumption [16]. Moreover, to achieve persistent economic growth, the government should equal the education level and increase labor force quality [17]. The New Growth

theory also argues that education and research and development are one of the most factors affecting economic growth in the long run [18]. Therefore, it can be concluded that; both economic and environmental, human capital is really essential for both.

METHOD, DATA, AND ANALYSIS

The aim of this study is to identify how manpower/labor/human capital (policy) can achieve environmental sustainability. This study will use a Systematic Literature Review (SLR) to generate a justification from the reputable articles conducted. The data that are used in this study is secondary data and has been collected through Publish or Perish (PoP) by Harzing. PoP is a software program that retrieves and analyzes academic citations through a variety of data sources [19]. Furthermore, PoP can be used for many purposes such as: preparing for a job interview, conducting a literature review, and bibliometric research [20]. Moreover, this study will generate articles with criteria where the articles are indexed by Scopus and Web of Science (WOS) simultaneously. The searching process will include certain keywords such as: Manpower Policy, Labor & Environmental Sustainability, and Sustainable Development. Filtering articles will use PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) flow chart diagram. PRISMA is commonly used for Meta-Analysis but this study doesn't work with Meta-Analysis. The eligible articles chosen will be analyzed using VOSviewer to run bibliometric analysis and NVivo to run a query for each article. These steps are commonly called methods of triangulation [21]. To see the research design comprehensively, here is the related figure to show the research design (see Figure 1).

A bibliometric analysis is employed to analyze the collected data on the selected subject [22]. The bibliometric analysis utilized the technique of similarities visualization. The visualization is commonly called bibliometric mapping and it allows observing connections in the scientific field structure in terms of authors, countries, documents, keywords, and other scientific production elements [23]. The bibliometric analysis was conducted in three stages: data compilation; software and data cleaning; and analysis, interpretation, and visualization [24]. The eligible articles will be analyzed using the bibliometric (keyword) analyzer like Vos Viewer software developed by the Centre for Science and Technology Studies (CWTS).

Moreover, this study will also use NVivo to run a query for each article. NVivo is a software to analyze qualitative data that provide a tool and assistance for researchers in undertaking the qualitative research processes [25]. NVivo will help the researcher to run a certain query with different types of queries. One of the types that will be used in this study is Text Mining Query, in specific Word Frequency Queries. Text mining Query will assist researchers to search the text material in the database for specific words [26]. Furthermore, Word Frequency Query has generated automatically and will result in how much the frequency for each word is coded [27]. The results of this analysis will be triangulated to generate interpretations. Creswell (2009) and Sutopo (2006) said the validity and reliability of qualitative research can be reached through triangulation [28]. This study will use triangulation of methods to generate a justification [29].

RESULT AND DISCUSSION

Before showing the results, the Systematic Literature Review method which has been carried out through a search process using Publish or Perish in the period 1990 to 2021, as shown in Figure 1 (attached), there are 265 publications for the first level screening process. Then, there are 74 articles will be removed because it is other forms of articles (book review, chapter in book, proceeding, etc). At the second level, 163 articles are removed further because the journal isn't published in Scopus and Web of Science (WOS) simultaneously, so 28 articles are left. At the third level, the articles that don't contain any keywords (13 articles), references (1), and are not related to the topic (3) will also be removed. At the final stage, 11 eligible articles will be processed for further analysis. Here is the figure that shows the PRISMA flowchart (see Figure 2).

According to figure 2., the 11 eligible articles (internationally published) will be shown in the table below:

Table 1. Previous Research

No.	Author(s)	Title	Journal
1	Tsai (2012)	An Investigation of Taiwan's Education Regulations and Policies for Pursuing Environmental Sustainability	International Journal of Educational Development 32(2012), 359-365
2	Wen Lee et al. (2019)	Services Effectiveness of the Nature Centers for Sustainability of Environmental Education and Forest Policy Implication	Sustainability, 11(2457), 1-11
3	Rickinson & McKenzie (2021)	The Research-Policy Relationship in Environmental and Sustainability Education	Environmental Education Research, 27(4), 465-479
4	Lingard (2020)	The Changing and Complex Entanglements of Research and Policy Making in Education: Issues for Environmental and Sustainability Education	Environmental Education Research
5	Castley (1996)	Policy-focused Approach to Manpower Planning	International Journal of Manpower 17(3), 16-24
6	Delmas & Pekovic (2012)	Environmental Standards and Labor Productivity: Understanding the Mechanisms that Sustain Sustainability	Journal of Organizational Behavior, 34(2), 230-252.
7	Lasisi et al. (2020)	The Environmental Sustainability Effects of Income, Labour Force, and Tourism Development in OECD Countries	Environmental Science and Pollution Research, 27(17), 21231-21242
8	Sung (2007)	Incubators and Business Ventures in Korea: Implications for Manpower Policy	International Journal Technology Management, Vol. 38, No. 3, 248-267
9	Cop et al. (2020)	Achieving Environmental Sustainability Through Green Transformational Leadership Policy: Can Green Team Resilience Help?	Business Strategy and the Environment, 30(1), 671-682.
10	Chen et al. (2012)	Weak Ties, Labor Migration, and Environmental Impact: Toward a Sociology of Sustainability	Organization & Environment, 25(1), 3-24.
11	Assui & Effanga (2021)	Optimal Manpower Recruitment and Promotion Policies for the Finitely Graded Systems Using Dynamic Programming	Heliyon, 7(7), e07424.

Source: Data Processed

As mentioned before, these eligible articles would be analyzed in the two types separately (Mapping and clustering the keywords) and would be carried out by Vos Viewer. Here is the figure that shows the result (See Figure 3/attached). According to this result, there are two kinds of clusters: (i). The 1st Cluster (Red) contains 3 items: Policy, Policy Making, Education for Sustainable

Development; and (ii). The 2nd Cluster (Green) contains 2 items: Environmental Education and Sustainability. It means that all eligible articles show the same and related keywords (Education and Sustainability). Furthermore, the node of Sustainability is linked to the Environmental Education and linked to the Policy Making and Education for Sustainable Development nodes indirectly. Therefore, the implication that can be generated from this result is sustainability goals can be achieved through education.

Furthermore, the separate analysis is also run in an Automatic Query through NVivo. The same result as before are proved in the table below:

Table 2. Automatic Query Result

No	Word	Length	Count	Weighted Percentage (%)	Similar Words
1	Education	9	1278	1.37	breed, civil, cultivate, derive, develop, develops, didactics, educate, education, educational elicitation, enlightening, enlightenment, extracted, instructional, pedagogues, preparing, school, schooling, schools, teach, train
2	Research	8	865	1.16	Inquiry, exploration, explored, exploring, inquiry, investigate, investigations, research, researcher, researching, searching
3	Environment	13	777	1.1	environmental, environmentally

Source: Data Processed

The Query result is chosen in the synonym option to see what the meaning of the words is typical synonymously. The same result is generated in that table in which Education (1278 times) are the most frequent word generated in 11 eligible articles. To see a comprehensive result, the Word Cloud will show all the words generated in Query (See Figure 4/attached). This figure gives a helicopter view of this result. There are many words are displayed. Education, Policy, Research, Sustainability, Environmental, Manpower, and Productivity are the most frequent words in all eligible articles.

To see which article has the highest reference and coverage, here is the table that shows the information:

Table 3. References & Coverage of Query

Rank	Author(s)	Title	Journal	Ref.	Cov.
1	Tsai (2012)	An Investigation of Taiwan's Education Regulations and Policies for Pursuing Environmental Sustainability	International Journal of Educational Development 32(2012), 359-365	349	3.85%
2	Wen Lee et al. (2019)	Services Effectiveness of the Nature Centers for Sustainability of Environmental Education and Forest Policy Implication	Sustainability, 11(2457), 1-11	150	1.65%
3	Rickinson & McKenzie (2021)	The Research-Policy Relationship in Environmental and Sustainability Education	Environmental Education Research, 27(4), 465-479	196	1.38%
4	Lingard (2020)	The Changing and Complex Entanglements of Research and Policy Making in Education: Issues for Environmental and Sustainability Education	Environmental Education Research	177	1.21%
5	Castley (1996)	Policy-focused Approach to Manpower Planning	International Journal of Manpower 17(3), 16-24	44	0.69%

6	Delmas & Pekovic (2012)	Environmental Standards and Labor Productivity: Understanding the Mechanisms that Sustain Sustainability	Journal of Organizational Behavior, 34(2), 230-252.	146	0.67%
7	Lasisi et al. (2020)	The Environmental Sustainability Effects of Income, Labour Force, and Tourism Development in OECD Countries	Environmental Science and Pollution Research, 27(17), 21231-21242	57	0.52%
8	Sung (2007)	Incubators and Business Ventures in Korea: Implications for Manpower Policy	International Journal Technology Management, Vol. 38, No. 3, 248-267	53	0.44%
9	Cop et al. (2020)	Achieving Environmental Sustainability Through Green Transformational Leadership Policy: Can Green Team Resilience Help?	Business Strategy and the Environment, 30(1), 671-682.	40	0.28%
10	Chen et al.. (2012)	Weak Ties, Labor Migration, and Environmental Impact: Toward a Sociology of Sustainability	Organization & Environment, 25(1), 3-24.	42	0.25%
11	Assui & Effanga	Optimal Manpower Recruitment and Promotion Policies for the Finitely Graded Systems Using Dynamic Programming	Heliyon, 7(7), e07424.	24	0.15%

Source: Data Processed

According to this result, Tsai (2012) is the most generated article in this Query process which has 349 references and 3,85% coverage. Finally, the analysis generated by Vos Viewer & NVivo has the same result and implication where education can be used to achieve environmental sustainability goals. Sarkodie (2018); Armeanu et al. (2018); Zafar et al. (2019) implicitly argue that human capital is the most factor affecting the environment while education and human skills are concerned as the main factor [30]. According to Tsai (2012), there are several steps to support education as a success factor for achieving environmental sustainability, at least implemented in Taiwan: (i). Strengthening environmental education at least for 3 years at schools; (ii). Supervise all levels of schools; (iii). Promotes environmental habits in school; (iv). Involving environmental learning in the curriculum; (iv). Established an environmental voluntary system to promote environmental habit or lecture; (v). Hold the environmental pilot projects and hands-on environmental seminar and lecture; (vi). Synergize with other institutions or communities to promote environmental campaigns; (vii). Using public media as a promotion tool; so on [31]. According to these points, it can be implicitly concluded that the environmental or sustainability mindset must be given as early as possible (in schools). Furthermore, research is known as a tool to affect the development of environmental education and has a complex relationship with policies [32]. This is also related to the result of word cloud or text query that research also has a large frequency.

So, it can be concluded that research is also playing a crucial role to promote environmental sustainability through the development of education. Moreover, there is a fundamental question for the next, how to achieve a sustainable education? The simple answer is to enhance teaching quality. Furthermore, how teaching quality can be affected? The simple answer is that it depends on the design and implementation of human resources, activities, and a diverse curriculum

[33]. Moreover, to bring reforms in achieving environmental sustainability, green leadership is also considered to affect the green work engagement for each human capital [34].

CONCLUSION

According to the analysis, the main conclusion is that education has an important role in achieving environmental sustainability. But it should also be encouraged by several aspects, such as: the role of other entities (university), supervising the activity through green leadership to create green work engagement between human capital promoting environmental habits, involving the environment in the basic curriculum, and so on. It also implies that manpower should be well trained and educated because human capital is the most significant factor to achieve sustainability. Furthermore, the more manpower is trained, the more productivity would be.

IMPLICATION/LIMITATION AND SUGGESTIONS

This research has two main limitations: (i). The search engine (Publish or Perish) is restricted to several articles resulted, a maximum of 200 articles in every range of time. This limitation causes the articles chosen to be also limited; (ii). The method used in this research is limited to the qualitative approach. There should be a further analysis that involves a quantitative approach such as using the econometric approach to see the impact of education on environmental sustainability statistically.

Furthermore, according to the results, this research suggests for the government to: (i). Promote environmental education by involving it in the basic curriculum; (ii). Involving the researcher, academist, or university both nationally and internationally; (ii). Giving a voucher school plan for the young people, researchers, lecturers, and other related entities who are interested in environmental issues to learn in every school they want; (iii). Doing a sustainable environmental campaign continuously; and (iv). Implementing green leadership and high supervision by the government, especially for developing countries.

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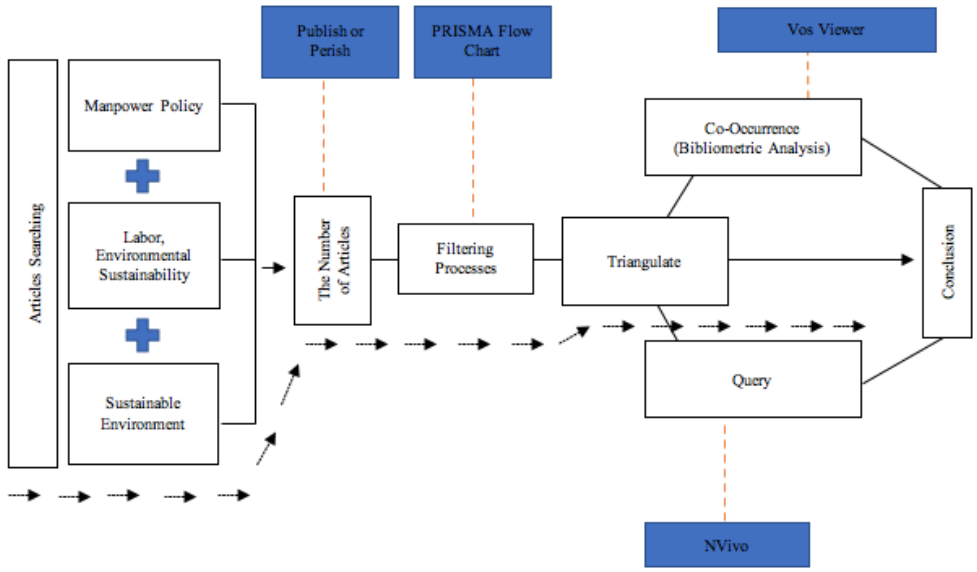

Fig. 1. Research Design

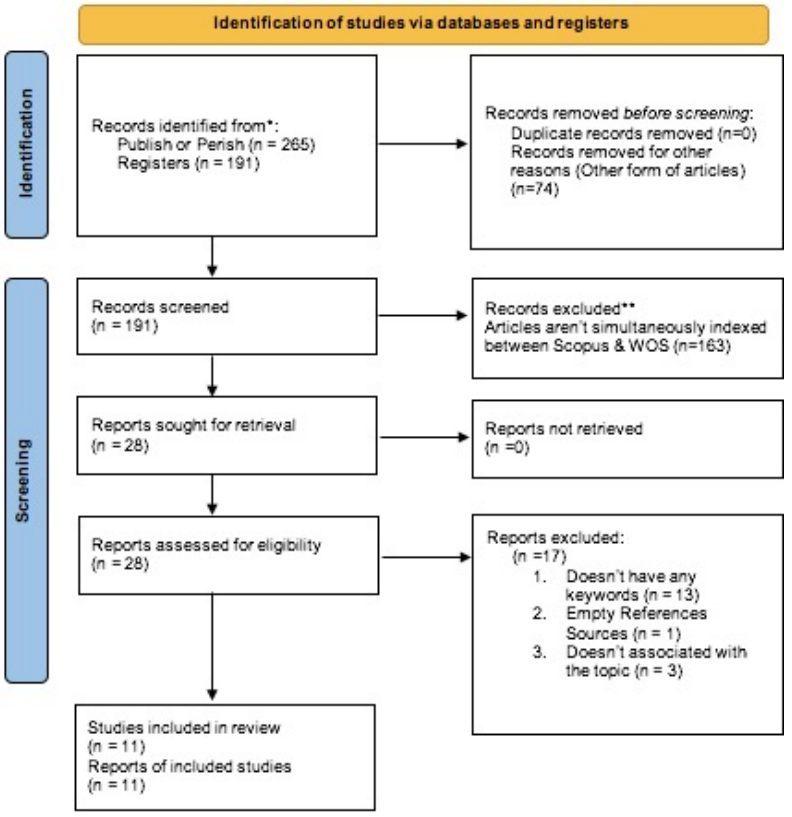

Fig. 2. PRISMA Flow Chart

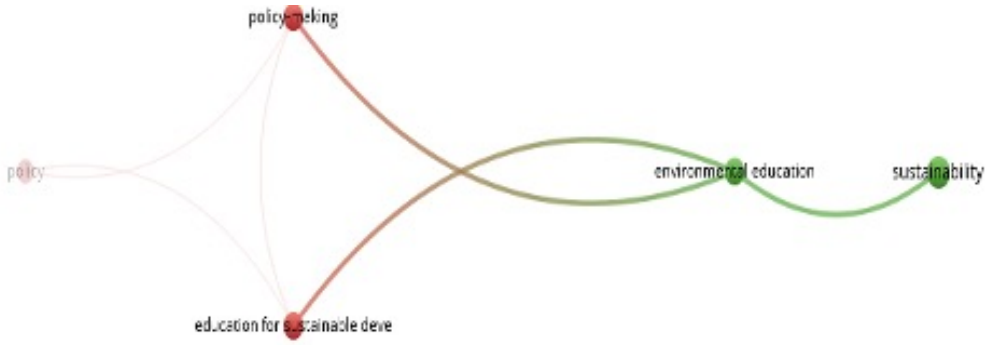

Fig. 3. Keyword Cluster

Fig. 4. Word Cloud