Environmental Accounting Disclosure Practices: A Bibliometric and Systematic Review

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ABSTRACT

The aim of this study is to examine the importance of Environmental Accounting Disclosure Practices (EADP) and provide a systematic review based on the existing literature. Bibliometric analysis technique was used in this research work based on the Scopus database over a 30-year period (1991-2021), using a sample of 190 articles we determined the most relevant journals, influential authors, countries, keywords, academic institutions, most cited papers, and trends. The results of the study show that this area of research is still at an early stage but is developing at a greater pace. The current analysis reveals that there is a steady rise in publications, and major academic work in this area was from Italy, the USA and the UK. This research also highlighted that environmental accounting disclosure practices have a positive effect on a firm's performance and that these disclosure practices are significantly dependent upon the firm's characteristics such as firm size, profitability, time of listing, financial leverage, board size and firm age. This research work does not consider books and chapters but only includes papers published in academics and international journals. Future researchers can also take into consideration other literature review techniques and various other database platforms for data extraction.

Keywords: Environmental Accounting Disclosure Practices, Firm Performance, Firm Characteristics, Bibliometric Analysis, Systematic Review, Environmental Accounting
JEL Classifications: G34, M14, M41, Q56

1. INTRODUCTION

In the early 1970s and late 1960s, the idea of corporate social disclosure in annual reports of firms initially emerged as a topic of argument on corporate social responsibility (CSR). At that time, corporate environmental disclosure (CED) was not presented separately, however it was considered a component of CSR. Normally, such disclosures were presented by the firms in their annual reports, but the majority of the time, these disclosures were insufficient, irregular, unparalleled, unproven and descriptive in nature. But in the last few years, the unfavourable environmental effect of economic development has ended up being a buzzword and a topic of great public issue around the world. Due to the green revolution and the growing concern about the environment, in the early 1990s, CED became a separate area of disclosures,

apart from CSR. During that time, some organizations in the USA and Europe began publication of some reports that included quantitative information related to environmental emissions and hazardous substances released by the industries. A study by KPMG (1994) reports that 87% of responding companies anticipated environmental problems to have an increasing impact on their companies in the following five years. There has been a worldwide awakening relating to environmental issues across the globe, all countries have actually ended up being much more worried about decreasing emissions of hazardous gases as well as the production processes that resulted in harmful substances.

Environmental accounting disclosure practices (EADP), which is still a comparatively new element of corporate sector, have gained popularity during 2000 and were formally known as

corporate social responsibility reporting (Uyar, 2016). Reporting environmental practices and presenting external validation of environmental reports are assumed to improve the accountability and responsibility of an organization. The major objective of this paper is to contribute in the gradually increasing EADP around the world using the existing literature. We are focused on determining the major studies influencing EADP research and investigating the key areas, and also comprehend the intellectual framework of the EADP. Environmental Accounting (EA) has received substantial attention in the academic community, international organizations and professional accountancy organizations because it is demonstrated in the large body of academic literature, consisting of scientific journals, publications and currently ongoing articles. EA has become an increasingly preferred subject for organizations such as the United Nation Department on Sustainable Advancement (UNDSD), Association of Chartered Accounts (ACCA), Institute for Chartered Accountants of England and Wales (ICAEW), Canadian Institute of Chartered Accountants (CICA), and International Federation of Accountants (IFAC), that has released numerous standards, rules and regulations. Researchers attempt to develop innovation theory and examine the concept of EA from different viewpoints with advancements in this research area. "EA is not limited to business accounting" (Bebbington and Gray, 2001). Attributes such as transparency, dependability, verifiability, auditability etc. ought to be exist in EA (Hines, 1988). This concept was broadened by Solomon and Thomson (2009), maintaining that "EA is a system that supplies inflows and outflows of information for numerous companies". In the present study we used bibliometric analysis which is regarded as a significant source of information and commonly used to validate the research policies, funding, career opportunities, advancements as well as to lead and support research projects based on the most impactful scientific literature. With the help of bibliometric analysis EA can generate suitable quantitative collaboration with interdisciplinary research. Therefore, this study implies the methods of bibliometric analysis for understanding the diversified work by examining the significant patterns in regards to its theoretical, academic and social framework.

2. THEORETICAL BACKGROUND

2.1. Environmental Accounting Disclosure Practices

Environmental accounting disclosure (EAD) "shows public social priorities, responds to government pressures, accommodate environmental pressures and also sectional interests, and safeguards company authorities and corporate images" (Child and Tsai 2005; Guthrie and Parker 1989). Environmental accounting is a branch of accounting which is used by both internal and external parties. For internal use it provides information regarding environment which is helpful for the management for taking decisions on pricing, regulating expenses and investment. External parties are public and financial communities with whom the environmental information is disclosed (Yakhou, 2004). Organizations are progressively being urged to represent, publicly reveal their internal and external environmental and social costs and report on their development towards higher sustainability to their stakeholders (Dutta, 2014). There are two types of environmental accounting now in use: voluntary and compulsory. So far, the

majority of reporting has been voluntary. As a result, the majority of environmental accounting literature examines voluntary disclosure through the lens of shareholder and legitimacy theory, demonstrating that firms engage in more voluntary disclosure in respect to societal or specific pressure from shareholders to validate their survival and growth (Adams et al., 1998; Clarkson et al, 2008; Milne and Patten, 2002; O'Donovan, 2002). Although these literatures show that the degree of voluntary environmental reporting has grown exponentially, but the quality has remained poor (Boiral, 2013; Milne and Gray, 2013), implying that CED has to be more reliable (Deegan, 2017). Firms, on the other hand are usually assumed to not implement voluntary disclosure until the advantages outweigh the costs (Nishitani et al., 2012). Corporate Environmental Accounting Disclosure (CEAD) is an important tool for organizations to connect with the community and demonstrate that they are meeting their environmental, societal, and economical obligations (Branco and Rodrigues, 2008). Currently, organizations are under extreme pressure to run their operations in environmental friendly conditions and to present data about their environmental performance (Ribeiro and Aibar-Guzman, 2010; Iwata and Okada, 2011). Tang and Li (2011), Makori and Jagongo (2013) mentioned that organizations will lose assistance from shareholders in the near future because EA reports do not belong to their mainstream reports.

Presenting social or environmental disclosure is a technique use to describe polces of corporate social responsibilities and to take duties for moral, social and environmental decisions (Adams, 2004; Brammer and Pavelin, 2006). However, considering the importance of corporate disclosures in reducing information asymmetry, the research on corporate disclosure levels revealed large discrepancies in disclosure levels between enterprises and countries (Demir and Bahadir, 2014; Aljifri et al., 2014). According to the United Nations Environment Programme (UNEP) and KPMG (2006), "EAD is a structure for companies to present environmental costs/liabilities as well as benefits/assets to sustain administration in decision-making, control and for public disclosure." EAD practices are the instructions and tasks that an organization uses to identify, determine, and reveal environmental problems in order to prepare environmental accounting information in accordance with accounting regulations. There is no criterion on environmental accounting practices and disclosures under the International Financial Reporting Standard (IFRS), which suggests that if environmental problems are within the range of specific accounting principles, such problems should be managed under appropriate standards. Likewise, International Accounting Standard (IAS) 1, "Presentation of financial statements calls for disclosure of material facts for an appropriate understanding financial statement". EAD bifurcates into economic and non-economic environmental efficiency and depicts environmental impact of the organizations (Adams and Whellan, 2009). According to Burgwal and Viera (2014), EAD refers to the disclosure of economic and non-economic data of an organization to stakeholders symbolized with the tasks of financial, environmental and social dimensions with an image of company setting.

EADP became more popular in the United States and the United Kingdom during the late 1990s (Harte and Owen, 1991).

This popularity was enhanced by two significant historical events, as indicated by Araya (2006). First event happened in 1987, when the Brundtland Commission of the United Nations defined "sustainable development" and argued for the establishment of sustainability reports (Schmidheiny, 1992). The next event occurred due to the Exxon Valdez disaster in 1989, the Coalition for Environmentally Responsible Economies (CERES) established the Valdez Principles. These principles laid forth a straightforward framework of environmental disclosure rules and asked members to report on their performance (Lin, 2008). One more significant development in environmental disclosure practices happened in 1992, when the Public Environment Reporting Initiative (PERI) was founded by ten large North American companies (including chemical fertilizer giants Dow and Dupont). PERI created extensive environmental disclosure rules that were in use until the mid-1990s (Araya, 2006). In 1993, the International Organization for Standardization (ISO) released the ISO 14000 standards and guidelines. It involves a variety of environmental disclosure factors in that it provides practical solutions for organizations to improve their environmental performance while also increasing production and advancement. This systematic review seeks to address the following research questions.

RQ1. What are the different environmental accounting disclosure practices and their components?

RQ2. Do environmental accounting disclosure practices influence the firm performance?

RQ3. Do environmental accounting disclosure practices depend upon firms' characteristics?

These research questions were converted into the following objectives:

1. To generate fads or trends in knowledge advancement in the area of environmental accounting disclosure practices.
2. To explore the expertise structure and acquire synthesis of knowledge.

3. METHODS

The existing literature on the environmental accounting concentrates on relevant academic research papers rather than developing new concepts. Therefore, we have chosen to use a bibliometric review approach to recognize and collaborate on the existing data for evaluation. This study intends to generate literary work and only reputable journals utilized for its source. This study consists of bibliometric review by using the Bibliometrics R package (Aria and Cuccurullo, 2017). Co-citation networks and content analysis (by reading all articles) is performed in this study. This will help in identifying, evaluating and analyzing the content in particular areas and also systemizing the concepts, theories and practices (Rowley and Slack 2004). Content analysis can be used to analyze and systemize data for duplication, crucial data is being selected for analyzing through Scopus database for ensuring the reliability of the data (Krippendorff, 2012). The major objective of this analysis is to provide advancement in this field of study by recognizing pattern of articles, scientific publications, journals, authors and their institute affiliation, keywords, trends, citations and co-citations (Treinta et al., 2014). This study adopted the methodological procedure identified by Tranfield et al. (2003) which includes planning, developing and presenting the results.

It is important to identify the standards and keywords utilized in this procedure of investigation and description of documents.

Figure 1 shows that the data required for this research were extracted after recognizing and choosing a suitable database, followed by running a search inquiry by making use of an ideal mix of several keywords. When the data set is developed using the appropriate addition and exemption standards, it is evaluated with the help of a software program. The bibliometric software 'Biblioshiny' was used for this study due to its high level of adaptability in customizing and readjusting the input data imported from different data sources and its capability to offer extensive data analysis for use in a variety of network analysis devices.

After extracting the required data from the Scopus database, we have performed the following steps for further analysis:

1. Export to CSV file of all the bibliographic data for preparing the descriptive evaluation of the 190 articles extracted on the topic (Figure 1). This data is classified on the basis of publications, title of journals, authors and their institutional affiliation, year of publication, countries and keywords.

2. Then the data was analyzed by using Bibliometrics package by R software (Aria and Cuccurullo, 2017). We used a set of tools for processing the data (190 documents) for extracting various outputs (e.g., annual scientific production, average article citations per year, top cited journals etc.) (Ekundayo and Okoh, 2018). R bibliometrics software is designed for performing bibliometric analysis written in R. According to Derviş (2019), "R is open-source software, which means that it operates in an integrated environment that consists of open libraries, open algorithm and open graphic software". When comparing it with other similar open-access software like VOS viewer, its focus is not only on visualizing the data but also to present the result more accurately and statistically robust.

3. After that we analyzed the selected 190 documents by performing content analysis which enriches the bibliometric analysis. It also aims to arrange the most studied topic/subject

Figure 1: Flowchart of database selection
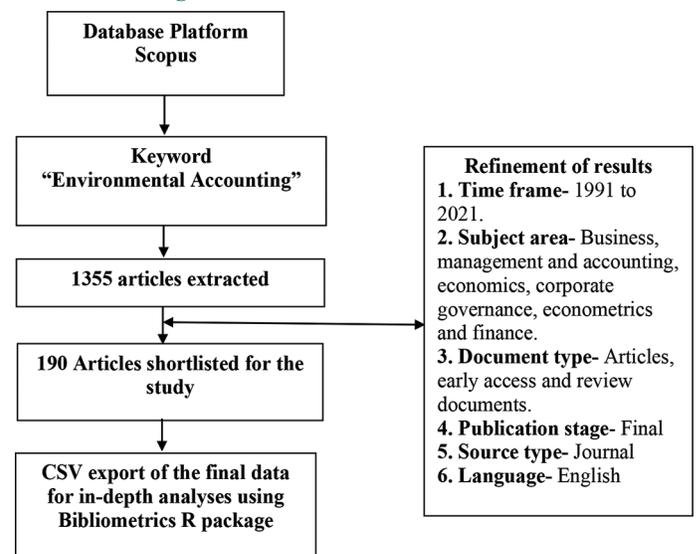
in this area of research in different regions for developing the clusters (Seuring and Gold, 2012).

4. After thoroughly analyzing the literature related with the topic, we have answered the research questions which was presented above.

3.1. Bibliometric Analysis

Bibliometric analysis is a subset of scientometrics, that examines scientific tasks in research studies using statistical and quantitative techniques. (Callon et al., 1991). It gives a broad image of a research study that can be categorized by journals, articles, publications, keywords, authors and their affiliations. Bibliometric approaches include two major techniques: "performance analysis and graphic mapping" (Noyons et al., 1999). Performance analysis examines the effect of citations of scientific production generate by the various elements (countries, universities, departments and researchers) that engage in a research study (Yu and Shi, 2015). Graphic mapping purposes to highlight the framework and characteristics of scientific areas. It is a structural presentation of how disciplines, areas, concepts, authors and records are connected to each other (Munoz et al., 2014).

3.2. Database Selection

An organized summary of indexed papers in the data source is a significant prerequisite of bibliometrics analysis. Depending on its availability of papers and categorization of journals as well as the accessibility of databases with bibliometrics package by R-studio, data extraction was performed from the Scopus database.

3.3. Data Preparation

Data was obtained via Scopus in a plaintext layout to support the software program requirements. Documents have been gathered based on the search standards used on 1st October 2021.

a) Search strategy for keywords – Majority of the research present study uses the word "environmental accounting". Hence, scientific knowledge relating to environmental accounting and its effect on companies' disclosure practices were recognized by applying the keyword search criteria.

b) Time frame - With the core purpose of identifying the patterns and points of view in the area of environmental accounting in regard to disclosure practices, the data included all publications between 1991 and 2021. Another reason for taking a period of 30 years for analysis is that it will eradicate the risk of occlusion of crucial work from the data. After refining it with Scopus and by selecting the time frame of 1991-2021 we have obtained 1355 files.

c) Area of study – The data was narrowed down by applying subject filter like accounting, econometrics, business management, economics, corporate governance and finance. In this stage 785 item were obtained.

d) Type of document – Accordingly fine tune the information to fulfil the research aims. Articles, early access and review documents are included in this data, as a result, the selected data includes 619 documents for further research.

e) Selection of final data - In the final round, selected papers were analyzed using filters (i) Publication stage-final, (ii) Source type- Journal and (iii) Language- English. After applying these filters, we have obtained the final data of 190 articles. Details

pertaining to these articles, such as title, authors, abstracts, and search phrases, were transferred in a plain text data style to biblioshiny for in-depth analysis.

3.4. Selection of Tools

For detailed scientific research mapping, this research study implements a bibliometric method. It is indeed an age-old research study approach used in library and information sciences to improve the performance and reliability of libraries through statistical and quantitative evaluation of scientific publications (Tella and Olabooye, 2014). This research study makes use of the bibliometrics R-software, created in the R programming language by Ariaa and Cuccurullo (2017). This software assists in thorough bibliometric research studies, including data analysis and visualization. Bibliometrics is an open-source software program that was developed for thorough network analysis. It has the ability of continual up-gradation and assimilation with various other statistical R software's. This research analyzed the data making use of biblioshiny, that is a web-based program featured in the bibliometrics package. It executes scientific research mapping by utilizing core attributes associated with automated operations based on the bibliometrics package.

4. RESULTS AND DISCUSSION

Data set was incorporated into descriptive analysis and network analysis where the descriptive evaluation concentrates on analyzing bibliometric data relating to the basic attributes of the data set, like (1) journals (2) authors, and (3) papers, whereas network analysis performs substantial scientific research mapping via visualization techniques such as 3 field plots and thematic maps, and it also acquires knowledge frameworks to improve further evaluation.

4.1. Descriptive Analysis

Figures 2 and 3 represent the annual scientific productivity and citation history of the studies based on EADP. Figure 2 indicates the publication history of the identified articles covering a period varying from 1991 to 2021. The very first study included in the evaluation dates back to 1991, and they are quite scanty until 2005. Until 2006, there was a quite constant and minimal number of studies, while after 2006 there was a quick rise in the number

Figure 2: Annual productivity
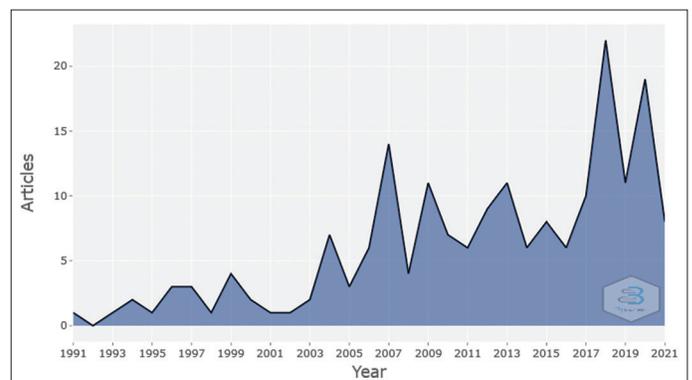
of studies, with a peak in 2018 and 2020. This pattern reveals that there is a growing interest in EA literature. Although the number is quite low and unsteady, this study field is still in its "early stage" and far from being completely discovered. Figure 3 represents the trend of the citations of the published papers related to EADP. During the period 1998 to 2001 there was a negative ascendancy of citations due to the poor quality of annual scientific production in this area of research as it was in its early stage. The average article citations per year showed a peak in 2002 in Figure 3. After that, it suddenly declined drastically, the recovery face started in 2004 and exhibited a sharp surge in the number of citations in 2007 and 2010.

Figure 4 depicts the Sankey plot showing the relationship between three areas namely authors, keywords and countries. The size of the section is symmetrical to the worth of the node (Riehmann et al., 2005). On the right side of the plot are the countries, center row are the key words, and left side are the authors. Each of the twenty illustrated noticeable keywords such as environmental accounting, sustainability, energy, environmental management, corporate social responsibility etc.in addition to their authors with their countries. All twenty prominent authors incorporated the subject "environmental accounting," showing its vital role in shaping "company disclosure practices." The total sample size of 190 research articles was published in 84 academic sources.
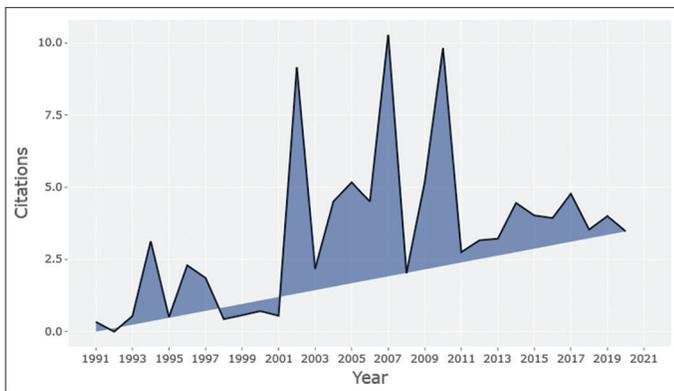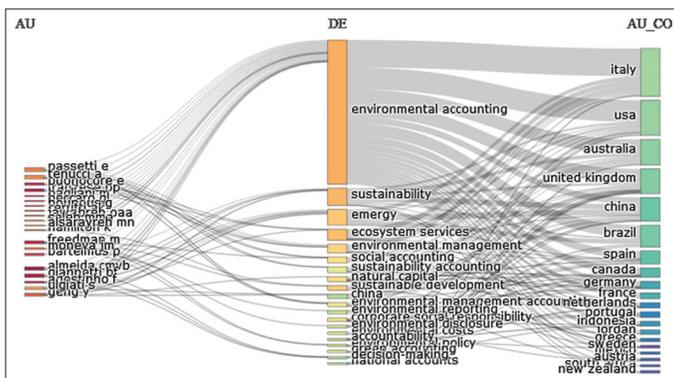
Figure 3: Average citation per year

Figure 4: Three field plot

4.2. Journals Analysis

Figure 5 represents the top 30 most effective journals on the basis of their citation. The "*Journal of cleaner production*" is at the top with a score of 32 articles and then "*Ecological economics*" with a score of 31 articles and then "*Accounting auditing and accountability journal*" with a score of 9 articles. The figure represents the other journals with scores of 6 or less. The *Journal of cleaner production* and *Ecological economics* are observed to be the most influential sources of publication related to environmental accounting disclosure practices. There is always an emergence of a multidisciplinary research domain, so we should not have to be domain specific. Most cited journals in this study are multidisciplinary in nature as they focus on cleaner production, environment, sustainability, ecological science, economics and societal dynamics. These journals provide a platform for addressing concrete challenges or issues associated with economic activities in a way that improves sustainability, human well-being with justice.

Figure 6 represents the 30 most imperative academic journals in the domain, rooted on the *H*-index. The *H*-index is used to represent the journal quality based upon their citation effect as well as performance. The *H*-index describes an optimum value of "n" where "n" relates to the variety of journals that have published "n" articles that have the least "n" citations. However, neither journals with the most articles in the field nor the journals with the most citations can simply show the journal's contribution to the field. The *H*-index could be a far superior indication of the high quality and quantity of a journal. This fig highlighted a very high H index for the journals of "Ecological Economics (H Index = 20)" and "Journal of cleaner production (H index = 19)". The other journals have H index 7 or less.

Applying Locally Estimated Scatterplot Smoothing (LOESS) to highlight the variety of publications over time, Figure 7 reveals the source patterns of the leading 5 journals. This figure illustrates that ecological economics shows a rapid increase in publication from 2007 onwards and there is also a spike in the publication for journal of cleaner production from 2013 onwards. Although the other journals show a constant increase in publications in past few years, this might indicate the emergence of an interdisciplinary research study domain. The majority of the cited journal consists of domains like business economics and finance including interdisciplinary research studies in areas like accounting and corporate governance.

4.3. Authors Analysis

Figure 8 represents the most prominent authors who published papers on environmental accounting disclosure practices. Almeida et al. were the most efficient authors with the highest number of publications in this area. Almeida, Franzese and Giannetti had 5 articles, while Buonocore and Freedman, had 4 articles published in this area. Figure 9 represents the *H*-index of the authors where the authors Almeida, Giannetti, Franzese and Freedman were the most effective authors. Figure 10 shows the thirty most relevant affiliations of authors with universities
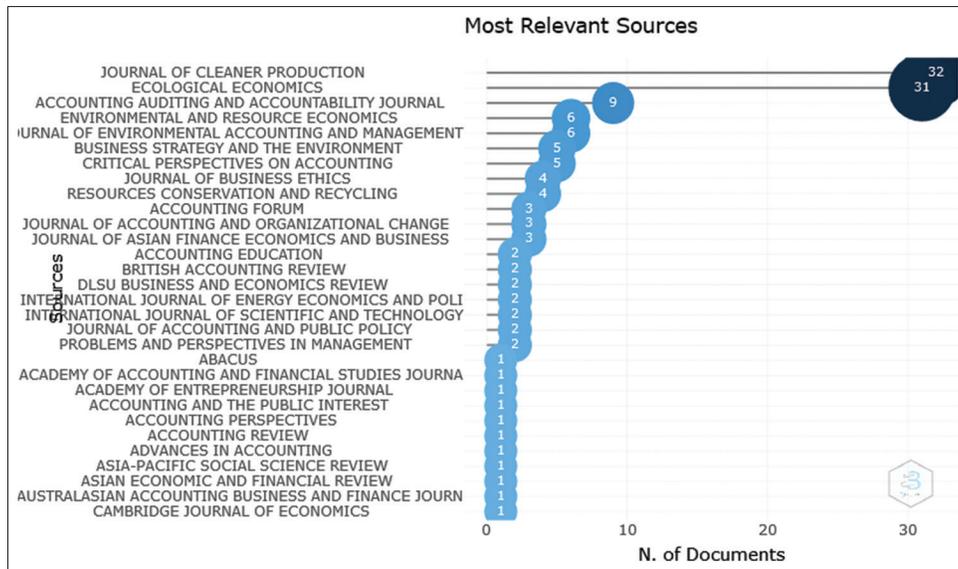
Figure 5: Top cited sources
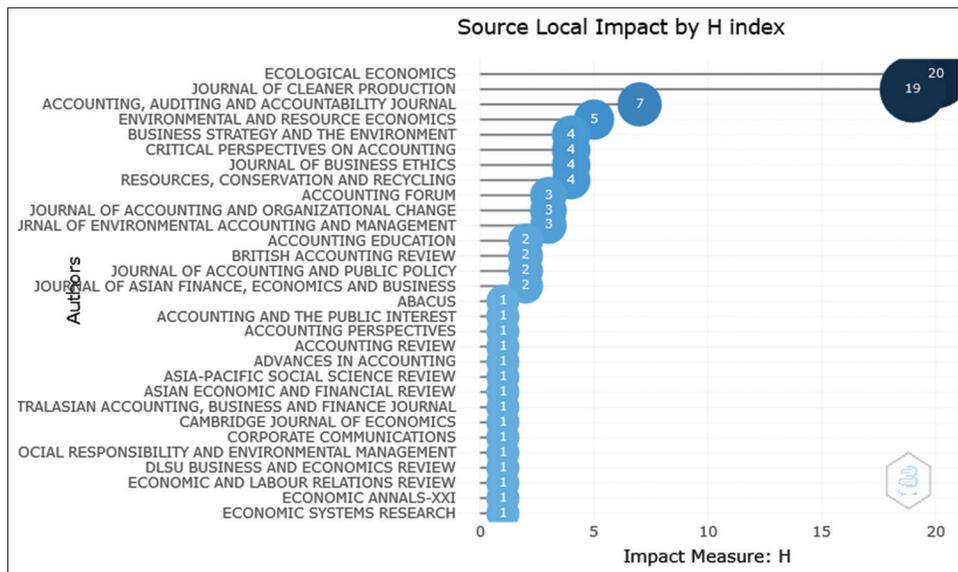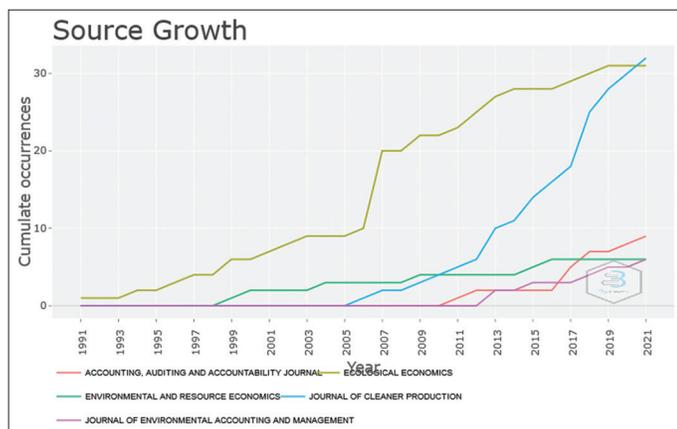

Figure 6: Top 30 impactful resources

Figure 7: Source dynamics

University of Turin with a score of 12. Country scientific production (Figure 11) reveals the contribution of various nations to the area, suggesting that developed nations provided the most literature in this field. Italy received approximately 16% of the publications in this field, while the USA had 13%, followed by Australia 8%, on the other hand China had 6%, and India had only 1% of the publications.

Figure 12 reveals that the USA published the large portion of papers under this area, with approximately 2,442 citations followed by UK 1,108 and Italy 358, while on the other hand China is at the middle of the table with approximately 287 citations and India is at the bottom of the table with 19 citations only. Citation rate is very high in USA, UK and Italy due to the reason that these countries were among the first to recognize the importance of businesses engaging with the community and implementing EA initiatives for the betterment of the society.

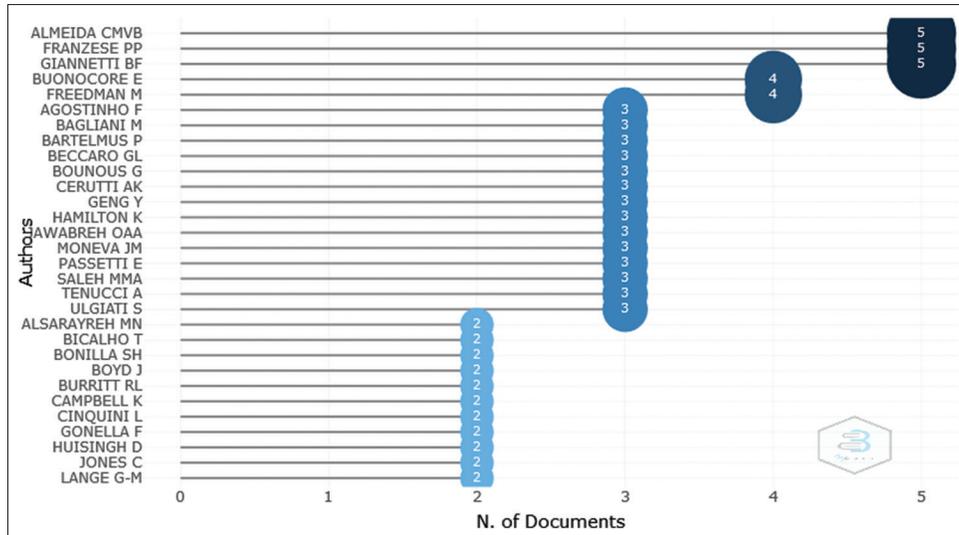around the world. Parthenope University of Naples is at the top with a score of 15, followed by Universidad Paulista and

Figure 8: Most relevant authors

Figure 9: Author's impact
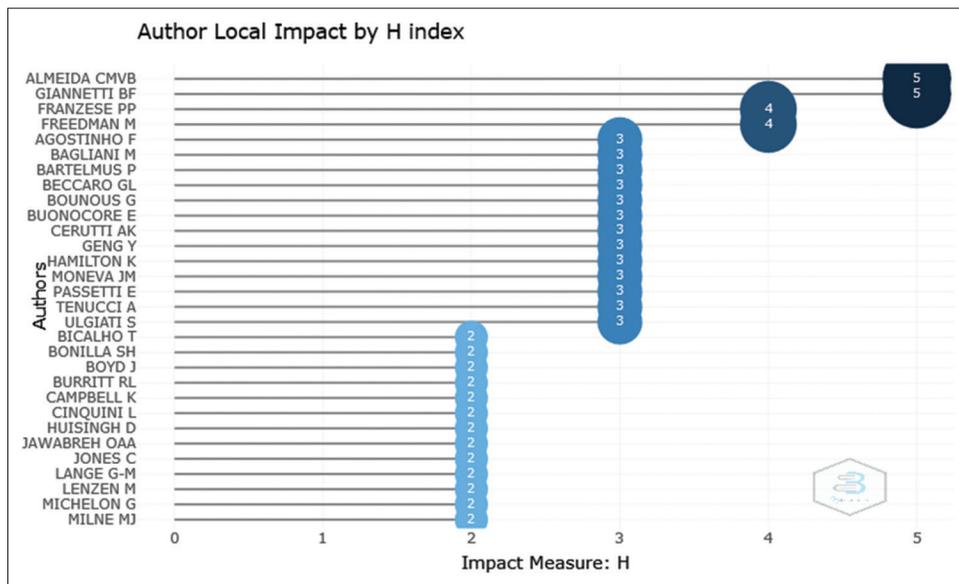
Figure 10: Most relevant affiliation

Figure 11: Country scientific production

the minister of CSR, inauguration of environmental reporting awards and the foundation of many environmental and societal research organizations. For least cited nations this might suggest that steady development of these nations in the direction of high-quality research study in this field. Figure 13 provides the 30 most cited documents in this area, and the majority of
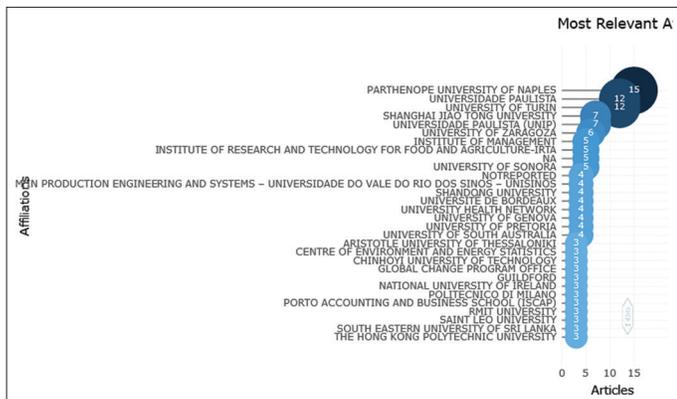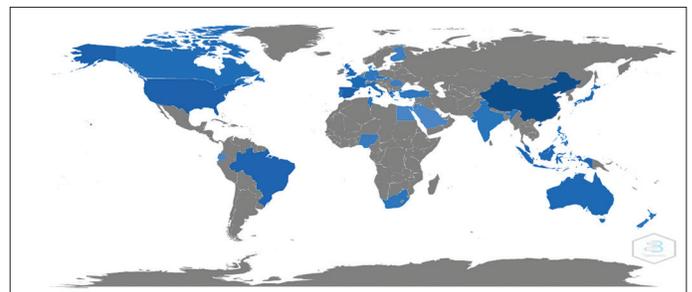
Several EA related projects have been implemented in these countries which consists of the establishment of a specialized department for environmental reporting which comes under

the documents have more than 100 citations. The highest cited document was authored by Boyd, second highest cited document was authored by Dietz and the third most cited document were authored by Clarkson, indicates the seminal contribution of these three authors in this area.

4.4. Keyword Analysis

An evaluation of the frequency of key words applied in the articles revealed that the term "sustainable development" occurred 36 times, followed by "environmental economics", "environmental accountings", "environmental management", "environmental impact", "natural capital", "sustainability", "decision making", "economics" and "energy". The word dynamics shown in Figure 14 is a visual demonstration of the frequency of words in the articles suggested by the size of words. In addition to these EA variables such as economic analysis, carbon dioxide, ecosystem service, forestry, ecological footprints, environmental policy, environmental assessment and natural resources were seen to be dominant.

Next, we further the academic discussion by highlighting measurable trends of environmental accounting research. Figure 15 shows the development of emerging themes on a two-

dimensional scale, with the logarithm values of keywords on the vertical axis and representing the number of years of publications on the horizontal axis. A look back over the last 24 years data revealed a fascinating pattern. The leading topics in the initial years were environmental accounting (17 frequencies), agriculture (5), and economic analysis (9), while in the middle years, they were sustainability (16), environmental impact (18), and natural capital (16). In recent years, the topics have revolved around environmental management (21), energy (10), ecosystem (7) and many more.

4.5. Network Analysis

"The descriptive styles are plotted on a two-dimensional plot in the thematic map" (Cobo et al., 2011). Keyword clusters were determined using co-word analysis, results in the formation of themes in the research subject area. These themes can be divided into four quadrants rooted on their frequency and centrality on a two-dimensional graph, and all the themes are displayed on the map by a bubble. "Sustainable development", "environmental accounting", "Europe" and "pollution control" can be depicted on the graph in Figure 16. In the upper right quadrant "sustainable development", with high frequency and centrality is a motor theme, and goes to the core of the discipline and one of the most extensively explored topics. The theme "environmental accounting" that is present in the lower right quadrant is a basic theme, signaling important yet not well-developed areas. The upper left quadrant shows a niche theme, "pollution control" which is well-developed with inner links but poor from outside and is of limited relevance. The lower left quadrant theme "Europe" is weakly established and less significant. It demonstrates both emergent and declining connections (Ariaa and Cuccurullo, 2017; Huang et al., 2020).

The development of core themes is recorded by applying a three-field plot which is represented in Figure 17. Taking a closer look at the inter-linkages between the themes which are divided by three-time periods, specifically between 1991 and 2009, 2010 and 2017 and 2018 and 2021 highlights the
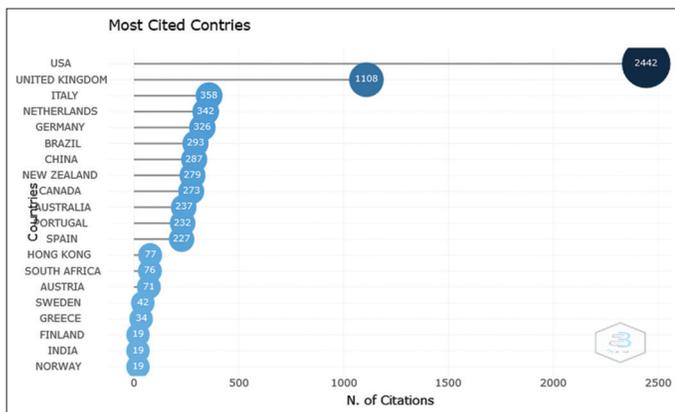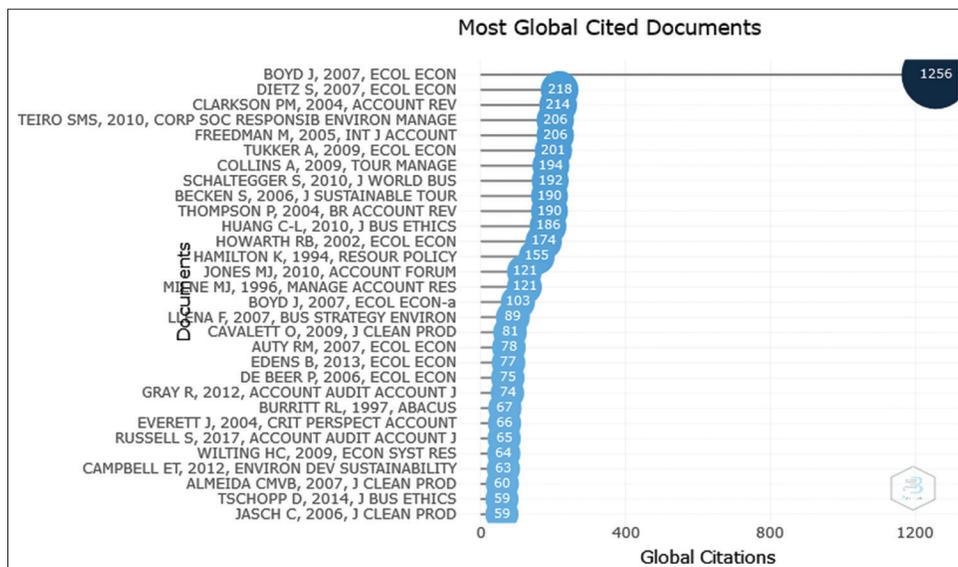
Figure 12: Most cited countries

Figure 13: Most cited documents

thematic analysis. Four significant themes in the first duration specifically Eurasia, sustainability, environmental economics and environmental accounting merged into environmental economics and environmental accounting themes. Whereas the four themes in the second period, that include ecology, environmental management, economic analysis and ecological footprints combined into the single theme of environmental economics. This identifies the emergence and relevance of environmental economics and environmental accounting.

The co-occurrence network includes those words obtained by using algorithm on a computer on the basis of frequently occurring words in record titles and reference lists. They are chosen because they preserve record content with even more intensity and flexibility (Garfield and Sher, 1993; Zhang et al., 2016). As shown in Figure 18, the data revealed four groups, denoted by the colors blue, red, green, and purple. These colors describe various clusters; the distance between them indicates relatedness; the vertex is depicted by words; and the size of the node is proportional to its frequency. The blue cluster is dominated by sustainable development and environmental accounting; the

cluster highlights environmental economics and natural capital; the green cluster represents environmental costs; and the purple cluster indicates environmental policies and environmental auditing.

In Figure 19 the first cluster which is highlighted by red is showing that the researchers from U.K were found to have strong association with the researchers of Australia and Germany. Second cluster highlighted by blue is dominated by USA in collaboration with Brazil and many south American nations. Third cluster is highlighted by green which is led by Italy along with Spain and Portugal. From the above figure we can conclude that major continents like Europe, North America, South America and Australia are integrated and having joint production between them.

Figure 20 presents different clusters of authors collaboration, red cluster highlighted that Almeida is found to be the most prominent author having highest centrality measures and with largest collaboration followed by Giannetti and Agotinho. Green cluster had authors like Beccaro, Bagilani, Bounous and Cerutti who had immensely contributed in this area. Blue cluster had authors such as Franzese, Russo and Buonocore who are the pioneers in the field of EADP.

5. ENVIRONMENTAL ACCOUNTING DISCLOSURE PRACTICES AND ITS COMPONENTS

In India only a small percentage of corporations voluntarily disclose environmental concerns in their annual reports. Environmental disclosure is influenced positively by factors like highly polluting industries, corporate size, high debt-to-equity ratios, and environmental performance, (Gupta, 2011) concluding the low level of environmental reporting activity in India. The automobile and IT sectors in India have the highest

Figure 14: Word dynamics
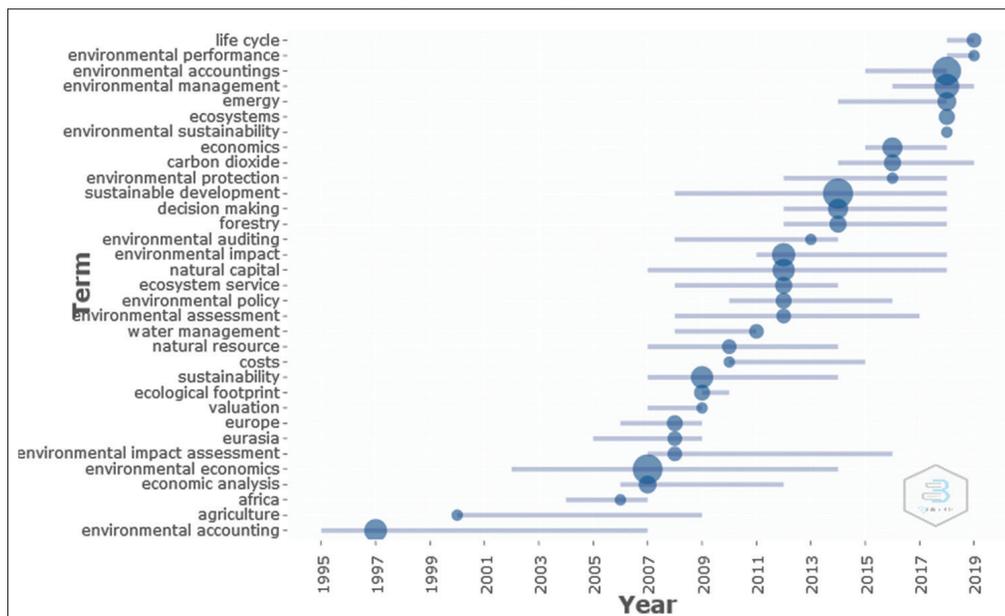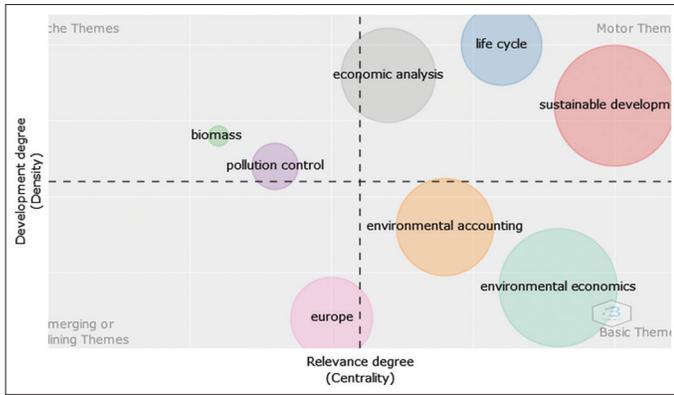

Figure 15: Trend topics

Figure 16: Thematic map

Figure 17: Thematic evaluation of three field plots

Figure 18: Co-occurrence network

Figure 19: Countries collaboration network

Figure 20: Authors collaboration network

companies disclosed the most environmental information, whereas companies in the hospitality and industrial sector disclosed the least. Companies in Zimbabwe are not aware of environmental reporting practices, and the absence of the standards to govern such disclosure results in voluntary disclosure, non-disclosure, and obligatory disclosure which ultimately leads to least or no disclosure, study concluded that many companies disclose only positive qualitative disclosure information in their annual report (Innocent, 2014). Yuliarinia et al. (2017) explored the existing EA practices that highlighted pragmatism from morphological institutions in their quest to perform complex responsibilities and survive in a competitive business environment. One more observation for the weak trends is because the practices are not implemented by a credible theoretical framework of EA practices, and it heavily relies on technical direction from accounting standards. In Europe and America out of 500 companies only 67% (335) are found releasing environmental reports, of these 335 reports, 47% address climate change, 33% publish quantitative
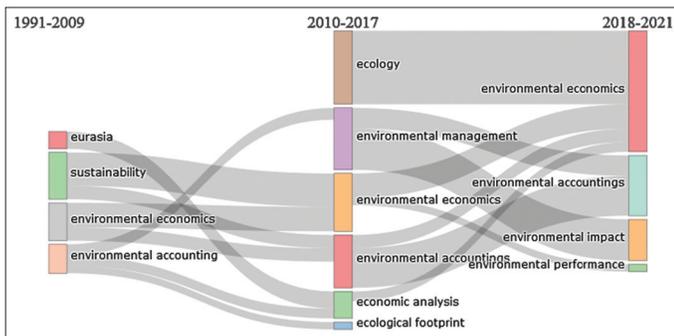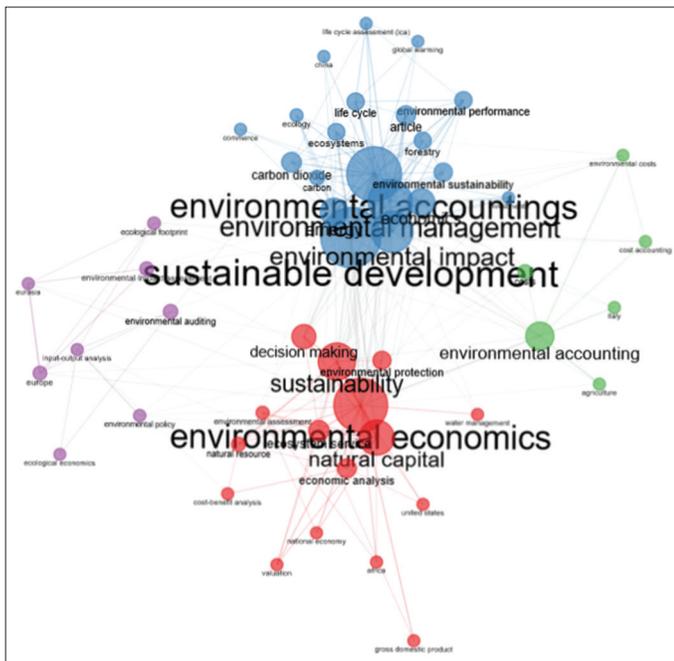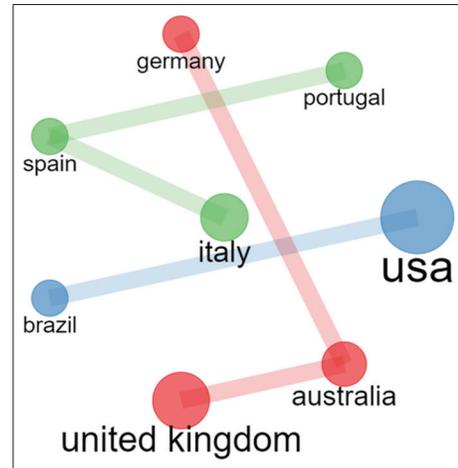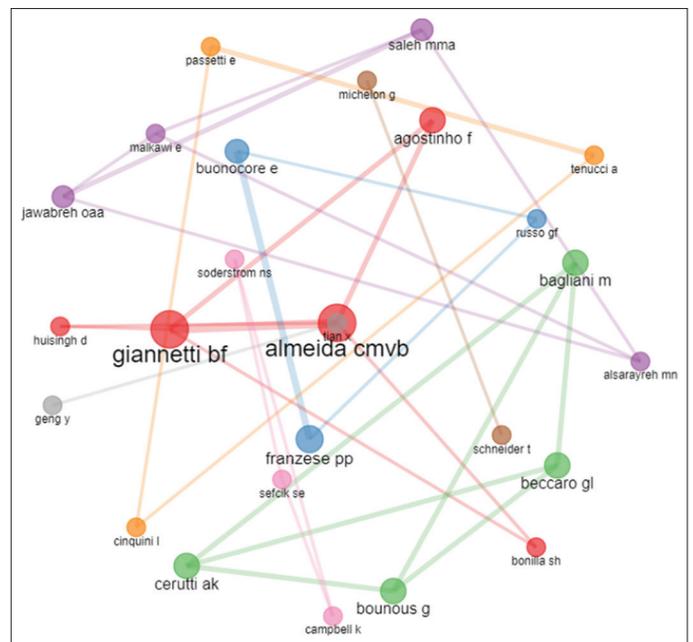
environmental scores, while the banking sector has the lowest, the study recommended that Indian companies must take a more robust and long-term action plan for addressing climate challenges in the near future (Bhasin et al., 2014). Juhmani (2014) revealed that there is a highly significant positive association of environmental accounting disclosure with financial leverage and audit firm size in Bahrain. He also found that financial institutions and insurance

GHG emissions data and 20% assign management responsibility for addressing climate change, the study also found that firms which have more reports on environmental problems and global warming are obtaining more generosity from shareholders (Wayman, 2008).

Environmental accounting disclosure components also include managers' attitudes toward stakeholder's perceptions, they discovered a link between environmental managers' attitudes toward distinct stakeholder groups and how they responded to stakeholder expectations for social legitimacy (Cormier et al., 2005). Beredugo et al. (2018) determined that corporate governance significantly mediates the effects of EFP (Environmental Fines and Penalties), EWM (Environmental Waste Management) and EC (Environmental Compensation) on the quality of financial reports of manufacturing firms in Nigeria, they also recommend that inculcation of the board committee on environmental risk management will enhance the quality of financial reporting. Another recent study related to Nigerian oil and gas companies by Bala and Lawal (2021) highlighted that ROA has a positive but insignificant impact on CEAD, firm size has a positive and significant effect on CEAD, and leverage was statistically found to have a positive and significant influence on CEAD, they concluded that any increase or decrease in the proportion of leverage will have an increasing or decreasing effect on CEAD. In the case of China, companies' environmental sensitivity and size are apparently the major components that are affecting their environmental disclosure practices, and the study proposed that financial performance is not significantly related to environmental disclosure practices (Liu and Anbumozhi, 2009). Huang and Kung (2010) disclosed that the government in Taiwan pays extra attention to large corporations that have been fined for environmental breaches and firms tend to provide more environmental information under such scrutiny in order to boost their perceived legitimacy. They come to the conclusion that companies with a larger workforce and a more dispersed shareholding structure will have their employees and stakeholders pay more attention to their environmental reporting practices. Aggarwal and Singh (2018) revealed significant differences in sustainability reporting practices by industry-type with the energy sector being the best performer while telecommunication sector being the worst performers, they further explain that the score of sustainability reporting quality is considerably lower than the quantity.

5.1. Environmental Accounting Disclosure Practices Influence Firm Performance

The degree of environmental accounting disclosure information seems to have an influence on firms' financial performance now and in the near future, they also discovered a relative difference in financial performance between the two groups of companies that disclosed environmental accounting information and those that did not (Nguyena and Tran, 2019). Norhasimah and Bahari (2016) explored the top 100 public listed companies in Malaysia and found a significant relationship between total environmental disclosure and profit margins but no significant relationship between ROA, ROE, EPS and total environmental disclosures. Another similar study by Noor et al. (2013) found that there is an insignificant relationship of environmental disclosure

with ROA but a significant relationship with ROE, they also revealed that company size, leverage and industrially sensitive companies have a significant relation with firm performance. Environmental related cost management significantly influences companies' profitability and also enhances the firm's performance in Nigeria, and it determined that large firms positively disclose the information related to the environment. They concluded that environmentally friendly organizations enjoy a high level of corporate cooperativeness (Bassey et al., 2013). Zhongfu et al. (2011) applied Tobin Q as the indicator of economic performance on manufacturing companies listed on the Shanghai stock exchange, and found that EADP have a positive effect on the performance of listed companies.

Manufacturing organizations listed on the Indonesian stock exchange have a positive effect of environmental accounting disclosure practices on their stock performance (Rizal and Yatminiwati, 2020), on the other hand Kartika and Utami (2019) revealed that hospitality sector companies listed on the Indonesian stock exchange do not affect firm performance or firm value. In the case of Philippines, mining and oil companies have a significant effect of environmental reporting practices on firm performance and profitability when regulated by the factors like firm size, time duration of listing in PSE, auditor firm type, location and board size (Jamil and Rodiel, 2020). Haj and Aaydi (2011) found a significant negative association between EADP and the financial performance of companies in Tunisia. Environmental accounting has a negative relationship with earning per share and return on capital employed at Reliance Industry Limited, Gujarat, and a positive association with net profitability and dividend per share. The study also determined that large corporations report more environmental information in their annual and sustainability reports than medium-sized enterprises, and that the disclosure is more qualitative than quantitative (Kalola, 2021).

5.2. Environmental Accounting Disclosure Practices Depend Upon Firms' Characteristics

Profitability, size of the firm, and time spent on the stock exchange have a favorable impact on the degree of environmental accounting information disclosure, while financial leverage has a negative impact (Nguyen et al., 2017). Galani et al. (2011) analyzed the firms in Greece and found that firms with higher environmental ratings are belonged to more environmentally sensitive industries, and publish environmental information in accordance with GRI standards than the firms with lower environmental ratings. They concluded that discrepancies in environmental disclosure information amongst Greek companies are not explained by profitability or listing status. Tarus (2020) listed firms in the Nairobi securities exchange, Kenya established that ownership concentration had a negative influence on environmental accounting disclosure, on the other hand asset tangibility and capital intensity had a significant impact on environmental accounting disclosure. Kaur (2002) explored the companies listed in Malaysia and determined that the degree of disclosure is positively associated with the firm size, market capitalization, listing status, industry and type of audit firm. However, there is no conclusive evidence to support that profitability, leverage, ownership diffusion and proportion of assets have any effect on

environmental disclosure. Large companies in U.K which are less indebted and have diffused ownership are significantly more likely to make voluntary environmental reporting, furthermore they found that the quality of disclosures is positively associated with the firm size (Brammer and Pavelin, 2006). Chowdhury et al. (2020) explained that coherent with legitimacy theory can help the management to attain compliance or social outlooks and values through disclosure (Portella and Bora). Legitimacy theory proposes that profitable organizations are likely to publish more environment-related data, and they conclude that profitability has a significant relationship with environmental disclosure.

Indian non-financial companies that are listed in the national stock exchange show a positive relationship of company's environmental performance with the size of the board, and a negative relationship with the independent directors (Pareek et al., 2019). On the other hand, Garg and Kumar (2018) analyzed Indian private listed firms, and found that the level of environmental disclosure in annual and sustainability reports have a positive impact on the company's size and industry type. Firms listed in the Dhaka stock exchange revealed that firm size has a significant and positive impact on voluntary disclosure and firm age on mandatory disclosure, the study concluded that size of the firm and profitability have no impact on mandatory disclosure (Hasan and Hosain, 2015). Related studies in the case of Japanese, Jordanian and Kenyan listed companies revealed similar results that size has a significant positive influence on environmental accounting disclosures (Kokubu and Nashioka, 2001; Khalid et al., 2017; Umulkher and Muganda, 2017). Manufacturing, oil and gas listed companies in Nigeria indicate that greater voluntary disclosure of environmental information is occurring among larger and more lucrative organizations. These organizations report more environmental disclosure than smaller and less profitable organizations in order to highlight their commitment towards clean and safe environment to maintain their legitimacy, they concluded that firm size and age have significant effects on ED in Nigeria (Sulaiman et al., 2018; Lucky, 2016). Furthermore, many studies have revealed similar results that the level of CEA disclosure is dependent upon the size of the firm, and firms with larger asset size invest more in CEAD (Ahmed and Nicholls, 1994; Akhtaruddin, 2005; Alam and Deb, 2010).

6. CONCLUSIONS

This research work presents a generic and diversified picture of EADP around the world, covering the period from 1991 to 2021. We used bibliometric analysis tools to evaluate the EADP literature based upon the prominent scientific research database Scopus. The findings of the study highlighted that this duration supervised substantial contributions in the research world, and the variety of citations associated with EADP grew significantly. The evaluation of EADP revealed mixed results in the extant literature between disclosure practices, firm performance and characteristics. It was observed that EADP are still at an initial stage in emerging countries due to the absence of the standards to govern such disclosure. Industry type is also an important component of disclosure practices as companies that are engaged in activities that are vulnerable to the environment are likely to

provide more environmental disclosure in order to increase their political legitimacy. Previous studies have revealed that EADP have a positive effect on firm performance both now and in the future. In their sustainability and annual reports, large corporations generally provide more environmental disclosure than medium-sized enterprises, and such disclosures are more qualitative than quantitative. Furthermore, this literature review also highlighted that EADP significantly depends upon firm characteristics such as firm size, profitability, time of listing, financial leverage, board size, firm age. Among these characteristics firm size and profitability are the most studied characteristics that positively affect the disclosure level of environmental accounting information.

Some limitations are also pointed out, this research work is based only on Scopus, various other major database platforms could also be used for data extraction for future research. Keywords that we used in this study were chosen according to the definition of EADP and the related literature, and those keywords could be modified to include more articles and publications related to this field. The bibliometrics tool used in this study includes some methodological bias for which we have to set certain parameters and standards, so researchers can use other systematic review techniques in the future. Another important drawback of this study is that it includes papers published in academics and international journals only, and it does not consider books and chapters. We also brighten the path for future research to examine relationship between EADP and environmental taxes which are imposed on environmental activities in both developed and developing economies. It would be very interesting to see how these taxes will influence the environmental disclosure practices. EADP is a dynamic process, so for future studies researchers can also explore the enforcement of regulations in accessing environmental disclosure among different sectors of the economy by identifying different themes and networks with the help of bibliometrics package. There are some themes and topics that are untouched or overlooked in this area such as ecological economics and life cycle assessment. Researchers can also examine these themes and topics for the future research, it would be great to see how these themes and topics should make environmental accounting more concrete. This systematic and bibliometric review study shows that this area of research is still at an early stage but is developing at a great pace, with an increasing range of publications, authors and regions.

REFERENCES

Adams, C. A., Hill, W.Y., Roberts, C.L.A. (1998), Corporate social reporting practices in Western Europe: Legitimating corporate behaviour? The British Accounting Review, 30(1), 1-21.

Adams, C.A. (2004). The ethical, social and environmental reporting-performance portrayal gap. Accounting, Auditing & Accountability Journal, 17(5), 731–757.

Adams, C.A., Whelan, G. (2009), Conceptualising future change in corporate sustainability reporting. Accounting, Auditing and Accountability Journal, 22(1), 118-143.

Aggarwal, P., Singh, A.K. (2019), CSR and sustainability reporting practices in India: An in-depth content analysis of top-listed companies. Social Responsibility Journal, 15(8), 1033-1053.

Akhtaruddin, M. (2005), Corporate mandatory disclosure practices in Bangladesh. The International Journal of Accounting, 40(4), 399-422.

Aljifri, K., Alzarouni, A., Ng, C., Tahir, M.I. (2014), The association between firm characteristics and corporate financial disclosures: Evidence from UAE companies. The International Journal of Business and Finance Research, 8(2), 101-123.

Aparicio, G., Iturralde, T., Maseda, A. (2019), Conceptual structure and perspectives on Entrepreneurship Education Research: A bibliometric review. European Research on Management and Business Economics, 25(3), 105-113.

Araya, M. (2006), To Tell or Not to Tell? Determinants of Environmental Disclosure and Reporting in Corporate Latin America (Thesis). New Heaven: ProQuest.

Aria, M., Cuccurullo, C. (2017), Bibliometrix: An R-tool for comprehensive science mapping analysis. Journal of Informetrics, 11(4), 959-975.

Bani-Khalid, T., Kouhy, R., Hassan, A. (2017), The impact of corporate characteristics on social and environmental disclosure (CSED): The case of Jordan. Journal of Accounting and Auditing: Research and Practice, 2017, 369352.

Bassey, B., Effiok, S., Eton, O. (2013), The impact of environmental accounting and reporting on organizational performance of selected oil and gas companies in Niger Delta Region of Nigeria. Research Journal of Finance and Accounting, 4(3), 57-73.

Belhaj, M., Ayadi, S.D. (2011), Financial performance, environmental performance and environmental disclosure: The case of Tunisian firms. Afro-Asian Journal of Finance and Accounting, 2(3), 248-260.

Beredugo, S.B., Ihendinihu, J.U., Azubike, J.U. (2018), Environmental accounting disclosure and quality of financial reports: The mediating effect of corporate governance in quoted manufacturing firms in Nigeria. IOSR Journal of Economics and Finance, 10, 521.

Bhasin, N., Kar, R., Arora, N. (2014), Recent developments in environment disclosure practices of companies in India. In: Ethics, Human Security and Sustainability: Knowledge and Practices in Asia Pacific. Japan: Asian Bioethics Conference. p395-401.

Brammer, S., Pavelin, S. (2006), Voluntary environmental disclosures by large UK companies. Journal of Business Finance Accounting, 33(7-8), 1168-1188.

Branco, M.C., Rodrigues, L.L. (2008), Factors influencing social responsibility disclosure by Portuguese companies. Journal of Business Ethics, 83(4), 685-701.

Burgwal, D.V.D., Vieira, R.J.O. (2014), Environmental disclosure determinants in Dutch listed companies. Revista Contabilidade and Finanças, 25(64), 60-78.

Callon, M., Courtial, J.P., Laville, F. (1991), Co-word analysis as a tool for describing the network of interactions between basic and technological research: The case of polymer Chemsitry. Scientometrics, 22(1), 155-205.

Carandang, J., Ferrer, R. (2020), Effect of environmental accounting on financial performance and firm value of listed mining and oil companies in the Philippines. Asia-Pacific Social Science Review, 20(1), 117-134.

Chibvura, I. (2014), An Evaluation on the Environmental Accounting and Reporting Practices in Zimbabwe, Doctoral Dissertation. Zimbabwe: BUSE.

Child, J., Tsai, T. (2005), The dynamic between firms' environmental strategies and institutional constraints in emerging economies: Evidence from China and Taiwan*. Journal of Management Studies, 42(1), 95-125.

Chowdhury, M.A., Dey, M., Abedin, M.T. (2020), Firms' attributes and environmental disclosure: Evidence from listed firms in Bangladesh. Asian Journal of Accounting Perspectives, 13(2), 57-77.

Clarkson, P.M., Li, Y., Richardson, G.D., Vasvari, F.P. (2008), Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. Accounting, Organizations and Society, 33(4-5), 303-327.

Cobo, M.J., López-Herrera, A.G., Herrera-Viedma, E., Herrera, F. (2011), An approach for detecting, quantifying, and visualizing the evolution of a research field: A practical application to the fuzzy set's theory field. Journal of Informetrics, 5(1), 146-166.

Cormier, D., Magnan, M., Van Velthoven, B. (2005), Environmental disclosure quality in large German companies: Economic incentives, public pressures or institutional conditions? European Accounting Review, 14(1), 3-39.

Demir, V., Bahadir, O. (2014), An investigation of compliance with international financial reporting standards by listed companies in Turkey. Accounting and Management Information Systems, 13(1), 4-34.

Derviş, H. (2020), Bibliometric analysis using Bibliometrix an R package. Journal of Scientometric Research, 8(3), 156-160.

Diebold, W., Schmidheiny, S. (1992), Changing course: A global business perspective on development and the environment. Foreign Affairs, 71(4), 202-220.

Ekundayo, T.C., Okoh, A.I. (2018), A global bibliometric analysis of plesiomonas-related research (1990-2017). PLoS One, 13(11), e0207655.

Galani, D., Gravas, E., Stavropoulos, A. (2011), Company characteristics and environmental policy. Business Strategy and the Environment, 21(4), 236-247.

Garfield, E., Sher, I.H. (1993), Keywords plus™-algorithmic derivative indexing. Journal of the American Society for Information Science, 44(5), 298-299.

Gray, R., Bebbington, J. (2001), Accounting for the Environment. London: Sage.

Gupta, V.K. (2011), Environmental Accounting and Reporting-an Analysis of Indian Corporate Sector. Tamil Nadu: In World Business Institute Conference Proceedings.

Guthrie, J., Parker, L.D. (1989), Corporate social reporting: A rebuttal of legitimacy theory. Accounting and Business Research, 19(76), 343-352.

Harte, G., Owen, D. (1991), Environmental disclosure in the annual reports of British companies: A research note. Accounting, Auditing and Accountability Journal, 4(3), 42.

Hasan, M.T., Hosain, M.Z. (2015), Corporate mandatory and voluntary disclosure practices in Bangladesh: Evidence from listed companies of Dhaka Stock Exchange. Research Journal of Finance and Accounting, 6(12), 14-32.

Hines, R.D. (1988), Financial accounting: In communicating reality, we construct reality. Accounting, Organizations and Society, 13(3), 251-261.

Huang, C.L., Kung, F.H. (2010), Drivers of environmental disclosure and stakeholder expectation: Evidence from Taiwan. Journal of Business Ethics, 96(3), 435-451.

Huang, L., Shi, X., Zhang, N., Gao, Y., Bai, Q., Liu, L., Zuo, L., Hong, B. (2020), Bibliometric analysis of trends and issues in traditional medicine for stroke research: 2004-2018. BMC Complementary Medicine and Therapies, 20(1), 20-30.

Ingale, K.K., Paluri, R.A. (2020), Financial literacy and financial behaviour: A bibliometric analysis. Review of Behavioral Finance, 14(1), 130-154.

Ja'afar, Y., Bala, H., Muhammded Lawal, A. (2021), Determinants of corporate environmental accounting disclosure of oil and gas firms in Nigeria. Global Business Management Review, 13, 16-36.

Juhmani, O. (2014), Determinants of corporate social and environmental disclosure on websites: The case of Bahrain. Universal Journal of Accounting and Finance, 2(4), 77-87.

Kalola, R. (2021), An analysis of environmental accounting and firm profitability of reliance industry limited. Research Guru, 14(4), 1-8.

Kamran, A., Nicholls, D. (1994), The impact of non-financial company characteristics on mandatory disclosure in developing countries: The

case of Bangladesh. International Journal of Accounting Education and Research, 29(1), 62-77.

Kartika, S., Utami, W. (2019), Effect of corporate governance mechanisms on financial performance and firm value with green accounting disclosure as moderating variables. Research Journal of Finance and Accounting, 10(24), 150-158.

Kaur, H. (2002), Firm Characteristics and Environmental Disclosure Practices: An Empirical Investigation of Malaysian Public Listed Companies, Doctoral Dissertation. Lumpur, Malaysia: University of Malaya.

Kokubu, K., Nashioka, E. (2001), Environmental accounting practices of listed companies in Japan. Institute for Global Environmental Strategies (IGES) Kansai Discussion Paper, 3, 1-18.

KPMG and United Nations Environment Programme. (2006), Carrots and Sticks for Starter. Current Trends and Tailored, and Dialogue Oriented Stage in Sustainability. Canada: KPMG.

KPMG. (1994), Canadian Environmental Management Survey. Canada: KPMG.

Krippendorff, K. (2012), Content Analysis: An Introduction to its Methodology. Thousand Oaks: Sage Publications.

Lima Ribeiro, V.P., Aibar-Guzman, C. (2010), Determinants of environmental accounting practices in local entities: Evidence from Portugal. Social Responsibility Journal, 6(3), 404-419.

Lin, L.W. (2008), Corporate Social and Environmental Disclosure in Emerging Securities Markets: China as a Case Study (Thesis). Urbana: ProQuest.

Liu, X., Anbumozhi, V. (2009), Determinant factors of corporate environmental information disclosure: An Empirical Study of Chinese listed companies. Journal of Cleaner Production, 17(6), 593-600.

Moral-Muñoz, J.A., Cobo, M.J., Peis, E., Arroyo-Morales, M., Herrera-Viedma, E. (2014), Analyzing the research in integrative and complementary medicine by means of science mapping. Complementary Therapies in Medicine, 22(2), 409-418.

Nguyen, L.S., Tran, M.D. (2019), Disclosure levels of environmental accounting information and financial performance: The case of Vietnam. Management Science Letters, 9(4), 557-570.

Nguyen, L.S., Tran, M.D., Hong Nguyen, T.X., Le, Q.H. (2017), Factors affecting disclosure levels of environmental accounting information: The case of Vietnam. Accounting and Finance Research, 6(4), 255.

Nishitani, K., Kaneko, S., Fujii, H., Komatsu, S. (2012), Are firms' voluntary environmental management activities beneficial for the environment and business? An empirical study focusing on Japanese manufacturing firms. Journal of Environmental Management, 105, 121-130.

Nor, N.M., Bahari, N.A., Adnan, N.A., Kamal, S.M., Ali, I.M. (2016), The effects of environmental disclosure on financial performance in Malaysia. Procedia Economics and Finance, 35, 117-126.

Noyons, E.C.M., Moed, H.F., Luwel, M. (1999), Combining mapping and citation analysis for evaluative bibliometric purposes: A bibliometric study. Journal of the American Society for Information Science, 50(2), 115-131.

O'Donovan, G. (2002), Environmental disclosures in the annual report. Accounting, Auditing and Accountability Journal, 15(3), 344-371.

Onmonya, O.L. (2016), Determinants of Environmental Disclosure by Public Interest Manufacturing Companies in Nigeria. United States: ICAN, FDA. p740.

Pareek, R., Pandey, K.D., Sahu, T.N. (2019), Corporate governance, firms' characteristics and environmental performance disclosure practices of Indian companies. Indian Journal of Corporate Governance, 12(2), 142-155.

Portella, A.R., Borba, J.A. (2020), Environmental disclosure in corporate websites: A study in Brazil and USA companies. RAUSP Management Journal, 55(3), 309-324.

Rahman, A., Raida, N., Jauhari, H.H.M., Roslan, N.F. (2013), An

empirical examination of the relationship between environmental disclosure. Journal of Contemporary Issues and Thought, 3, 77-92.

Riehmann, P., Hanfler, M., Froehlich, B. (2005), Interactive sankey diagrams. In: IEEE Symposium on Information Visualization, 2005. INFOVIS 2005. United States: IEEE. p233-240.

Rizal, N., Yatminiwati, M. (2020), Disclosure of green accounting on financial performance. Assets: Jurnal Ilmiah Ilmu Akuntansi, Keuangan Dan Pajak, 4(1), 1-7.

Rowley, J., Slack, F. (2004), Conducting a literature review. Management Research News, 27(6), 31-39.

Seuring, S., Müller, M. (2008), From a literature review to a conceptual framework for Sustainable Supply Chain Management. Journal of Cleaner Production, 16(15), 1699-1710.

Solomon, J.F., Thomson, I. (2009), Satanic mills? Accounting Forum, 33(1), 74-87.

Sulaiman, S., Aruwa, S., Musa, K. (2018), Firm characteristics and environmental disclosure practices of listed oil and gas firms in Nigeria. Journal of Accounting and Management, 1(1), 224-237.

Tang, G.P., Li, L. (2011), Environmental information disclosure, investor confidence and corporate value. Journal of Zhongnan University, 6, 70-77.

Tarus, J. (2020), Effect of firm-specific attributes on environmental accounting disclosure. Evidence from firms listed in the Nairobi securities Exchange, Kenya. African Journal of Education, Science and Technology, 5(4), 1-15.

Tella, A., Olabooye, A.A. (2014), Bibliometric analysis of African Journal of Library, Archives and Information Science from 2000-2012. Library Review, 63(4/5), 305-323.

Tranfield, D., Denyer, D., Smart, P. (2003), Towards a methodology for developing evidence-informed management knowledge by means of systematic review. British Journal of Management, 14(3), 207-222.

Treinta, F.T., Farias Filho, J.R., Sant'Anna, A.P., Rabelo, L.M. (2013), Metodologia de pesquisa bibliográfica com a utilização de método multicritério de apoio à decisão. Production, 24(3), 508-520.

Uyar, A. (2016), Evolution of corporate reporting and emerging trends. Journal of Corporate Accounting and Finance, 27(4), 27-30.

Wayman, M. (2008), The corporate climate communications report: A study of climate change disclosures by the global FT500. New Zealand: Corporate Climate Communications.

Yakhou, M., Dorweiler, V.P. (2004), Environmental accounting: An essential component of business strategy. Business Strategy and the Environment, 13(2), 65-77.

Yang, H., Le Luo, L., Bhattacharyya, A. (2021), Mandatory environmental reporting in Australia: An in-depth analysis of quantity and quality. Abacus, 57(4), 737-779.

Yu, D., Shi, S. (2015), Researching the development of Atanassov intuitionistic fuzzy set: Using a citation network analysis. Applied Soft Computing, 32, 189-198.

Yuliarini, S., Othman, Z.O., Ismaila, K.N. (2017), Environmental accounting practices: A regulatory and internal management perspective. Journal of Economic and Financial Studies, 5(3), 1-9.

Zhang, J., Yu, Q., Zheng, F., Long, C., Lu, Z., Duan, Z. (2015), Comparing keywords plus of WOS and author keywords: A case study of patient adherence research. Journal of the Association for Information Science and Technology, 67(4), 967-972.

Zhongfu, Y., Jianhui, J., Pinglin, H. (2011), The study on the correlation between environmental information disclosure and economic performance-with empirical data from the manufacturing industries at Shanghai Stock Exchange in China. Energy Procedia, 5, 1218-1224.