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Interconnections of Environmental Issues, Poverty, and Media: A Comprehensive Bibliometric Analysis (2016-2022)

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Abstract: This study provides a comprehensive analysis of the intersections between environmental issues, poverty, and the role of new media, including social media, over the period from 2016 to 2022. By conducting a systematic literature review combined with a bibliometric analysis of keyword co-occurrence, insights into the thematic focus and development trends within these domains were offered. Data were extracted from 46 articles indexed in the Scopus database, identified through the search criteria "environment" AND "poverty" OR in titles, abstracts, and keywords that contain the terms "news" AND "media." Analysis was conducted using VOSviewer v.1.6.18, revealing four prominent research streams within this multidisciplinary intersection: (1) the relationships among population dynamics, poverty, and environmental degradation; (2) examination of factors influencing environmental degradation and the areas most affected; (3) environmental policy frameworks and the processes involved in policy decision-making; and (4) risk mitigation in environmental policy, with a focus on inclusive economic development. This bibliometric analysis contributes to a refined categorization of existing literature and provides a framework for future research trajectories. By tracking the evolution of publications within each identified research stream over the past seven years, four key research questions were proposed to further explore these critical intersections. The findings aim to enhance scholarly understanding of the complex interdependencies among environmental challenges, poverty alleviation, and the transformative impact of media in the digital era.

Keywords: Environment; Sustainability; Development; Social media; Bibliometric analysis

1. Introduction

Environmental issues, poverty issues, and media are interconnected in the concept of Sustainable Development Goals (SDGs). Sustainable development was defined by the Brundtland Commission in the publication *Our Common Future* as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The definition contains two key concepts: (i) concept of need, particularly the essential need of the poor in the world that should be prioritized; (ii) an idea of the environment's limited ability of fulfilling the present and future needs (Keeble, 1988). Meanwhile, media (either conventional media or new media) serve as an instrument to channel the dynamic problems pertaining to poverty and environmental issues and to create public opinions on the issue. Analyzing the scope of media coverage on these issues offers valuable insights into the degree to which SDG targets, particularly Goal 1 ("No poverty") and Goal 12 ("Responsible consumption and production"), are supported and communicated. However, media has been found to contribute less maximally to communicating environmental and poverty issues (Bhattacharya et al., 2020).

This study research questions are: (i) How is the interrelationship between environmental issues, poverty, and the role of media mapped in existing studies published from 2016 to 2022? This addresses the focus of the study on understanding how these three themes (environment, poverty, and media) are connected and identifying prevailing research streams; (ii) What gaps in the research on environmental, poverty, and media interrelations remain unexplored and hold potential for future studies? The goal is to identify the areas that have not been fully addressed in the existing literature. (iii) How is the cluster of studies on environmental issues, poverty issues, and

the role of media? (iv) What is the gap in the research topic related to the interrelationship between environmental issues, poverty issues, and the role of media still having high potential to be developed? The theoretical foundation on environmental issues, poverty issues, and the role of media was presented, followed by the methodology, findings indicating the cluster of research, discussions, conclusions and recommendations for further research.

This study aims to: (i) map the existing body of research on the interrelationship between environmental issues, poverty, and media using a bibliometric analysis of studies from 2016 to 2022; and (ii) identify and analyze the gaps in research related to the environment-poverty-media nexus, particularly the underutilized role of media in these discussions. The novelty of this study is that it fills in the gap of research on a meta-analytical review of the interrelationship between environmental and poverty issues and the role of media through bibliometric co-occurrence analysis.

2. Literature Review

Previous studies have conducted bibliometric analysis on the relationship between poverty and life environment, but they are still limited to certain scopes. For example, Sarkodie & Strezov (2018) studied the Environmental Kuznets Curve (EKC) hypothesis by measuring greenhouse emissions such as carbon dioxide emissions. Burki et al. (2022) stated that the limitation of their bibliometric analysis is that it relied on one database only, i.e., the Web of Science, and recommended the use of other databases like Scopus. Referring to the limitation, this research continues the bibliometric analysis using the Scopus database and the media variable was added to study the relationship between environmental and poverty issues.

2.1 Relationship Between Environmental and Poverty Issues

The relationship between environmental degradation and poverty is very important to anticipate the consequence of climate change. A study on the interrelationship between environmental degradation and poverty is beneficial to find a theoretical proposition, which is useful to formulate environmental policies and poverty alleviation policies comprehensively by utilizing media as an instrument of advocating the policy of SDG achievement. Previous studies have found the paradoxical relationship between environmental and poverty issues (Luukkanen et al., 2015; Justice et al., 2017).

The keyword connecting environmental issues to poverty issues is environmental degradation. The World Bank defines it as deforestation, air pollution, land degradation, water scarcity and contamination, and lost biodiversity (Chakravarty & Mandal, 2020). Poverty refers to any forms of deficiency in humans, such as nutrition deficiency, inadequate healthcare, low education quality and income, exposure to various pollutions, and gender disparity (Akinlo & Dada, 2021).

There are two main schools of thought about the relationship between environment and poverty. The first school of thought argues that environmental degradation is caused by poverty (Khan et al., 2021; Malerba, 2020; Masron & Subramaniam, 2018; Setyadharma et al., 2020). Therefore, if the policymakers want to solve environmental problems, they should focus first on solving poverty problems. The proponents of this hypothesis claim that poverty compels the poor people to damage the environment physically to fulfil their economic need regardless environmental safety.

The second school of thought instead argues that it is environmental change that causes poverty (Akinlo & Dada, 2021; Asongu et al., 2017; Kousar & Shabbir, 2021). This argument builds on the fact that the environment affects the rural people's access to livelihood and, likewise, their vulnerability. The reduction of natural resources makes some people poor. There is a strong relationship between environmental degradation and poverty accentuation, and the degradation level can be used to predict poverty in the present and future. The degraded environment implies fewer resources available for the present and future generations. Therefore, even a little change in terms of the right to access, the utilization and the availability of natural resources affects the economic structure of society entirely. Thus, the cross-institution policy network that governs the use of natural resources contributes to people's wellbeing and poverty rate.

2.2 The Relationship Between Environmental and Poverty Issues in Media

From previous studies, it can be seen that the relationship of environmental and poverty issues to media is framed in the SDGs issue. Media is a precondition to meaningful progress and implementation in Agenda 2030. The literature available reveals that media can play an important role in delivering SDGs in a state, at least through five roles: (i) A channel of information flow; (ii) A monitoring and accountability watchdog; (iii) The enabler of a 'culture of peace'; (iv) The upholder of marginalised voices; and (v) Facilitating the localisation of SDGs (Bhattacharya et al., 2020; French, 2015; UNESCO Office in Jakarta, 2015).

Media as a channel of information flow means that media contribute to building citizens who are critical and tough and have broad knowledge. The role of media not only informs but also changes the citizens' process of

thinking to make them information literate and willing to participate, advocate, and monitor the successful implementation of SDGs, including maintaining environmental sustainability and alleviating poverty. Media as a monitoring and accountability watchdog means that media promote the accountability of a government's actions by monitoring the performance of public institutions, revealing the faults, giving feedback and advocating the changes, e.g., criticizing the non-pro-environment development policies or making the burden of the poor group heavier. Media as the enabler of a 'culture of peace' means that media serve to escort value, attitude, behaviour and lifestyle by declining violence to solve problems but promoting dialogue and negotiation between individuals, groups, and nations.

Media as the upholder of marginalised voices means media can ascertain that citizens' voices and needs related to government policies and actions are heard by providing a platform for public debates and dialogues. It also can improve the participation of those who can participate and potentially disclose the problem likely neglected. For example, the media often underestimate poverty as an issue and, when they report it, they do not give the poor people a room enough to explain their perspectives. Media can involve segments that mainstream poverty to help vulnerable and marginalised groups. New media can help a local community to make their voice heard and strengthen consultation and the community's ability to take actions. Media facilitating the localisation of SDGs means that media should encourage the development of community media, including the community's social media. Local relevant news corresponding to personal needs gets more attention from the community. Therefore, media should be optimized as local messengers. Community radio, social media, or other communication tools can be used to promote citizen journalism in order to fight for the rights of poor groups and local environmental issues.

Media play an important role in handling environmental and poverty issues. Nevertheless, media also plays a paradoxical role in reporting poverty or environmental issues (Pegu, 2017; Lugo-Ocando, 2019). Lugo-Ocando (2019) mentioned three media paradoxes in reporting poverty issues. Firstly, the important gap between the normative claims made by journalism as a professional agency for supervising the power and the actual facts shows that the editorial room tends to produce general information without questioning the power discourse. Secondly, it can be concluded that the news reporting poverty tends to concentrate on the manifestation of poverty more than its structural cause. Lastly, coverage of poverty frequently operates within a discursive framework that places responsibility on individuals rather than on structural conditions. A similar case occurs in environmental issues.

Pegu (2017) found that media in India has a little space to accommodate the news coverage about the environment and thereby journalists are not interested in environmental reporting. In addition, the journalists' comprehensive technical understanding of the environment is inadequate. Departing from the reason aforementioned, this study investigates the development of environmental and poverty issues in the frame of studies published in the period of 2017-2022.

To understand the complex interactions between environmental degradation, poverty, and media, this study builds on several key theoretical foundations. The EKC theory is frequently used to explain the relationship between economic development and environmental degradation. This theory posits that environmental degradation worsens in the early stages of economic growth. However, as income levels rise, societies begin to invest in environmental protection, leading to improved environmental outcomes (Sarkodie & Strezov, 2018). This framework provides a basis for understanding how poverty, particularly in developing countries, exacerbates environmental damage, while wealthier nations often exhibit more sustainable practices.

Additionally, the SDGs provide a global framework for addressing the twin challenges of poverty and environmental degradation. Media, both traditional and new forms, is vital in promoting the SDGs, particularly Goal 1 ("No poverty") and Goal 13 ("Climate action"), by raising awareness and holding governments accountable for their commitments (Bhattacharya et al., 2020).

The role of media is also informed by the Agenda-Setting Theory (AST), which suggests that media do not tell people what to think but rather what to think about. Media coverage of environmental and poverty issues can significantly shape public discourse and policy priorities (French, 2015). Moreover, the rise of social media has democratized information dissemination, allowing marginalized voices to participate in the conversation around sustainable development (Pegu, 2017).

These theoretical perspectives form the foundation for analyzing the nexus between environmental issues, poverty, and media in the existing literature.

3. Methodology

This study is quantitative research using bibliometric analysis (Moral-Muñoz et al., 2020; Perianes-Rodriguez et al., 2016; Zhong et al., 2016). Co-occurrence analysis and keyword analysis were also conducted to summarize the main theme of research and the direction of future research. Visualization of similarity viewer (VOSviewer v. 1.6.18) software was used to visualize and analyze the bibliometric network of living environmental issues, poverty issues, and media relationships from the articles selected from the Scopus database.

3.1 Data Selection Process

Three keywords were applied in a gradual process to take relevant literature from the Scopus database. A phased keyword approach was utilised, incorporating the terms “environment” AND “poverty,” OR in titles, abstracts, and keywords containing “news” AND “media.” The search period was restricted to articles published from 2016 (marking the SDGs' launch) to 2022 (the timeframe during which this study was conducted). Inclusion criteria refer to the inclusion of peer-reviewed journal articles and conference proceedings in English that explicitly discussed the intersection of environmental issues, poverty, and media. In terms of exclusion criteria, the editorial materials, book chapters, and articles not focusing on environmental or poverty issues were excluded.

After applying these inclusion and exclusion criteria, the data were rescreened with the criteria of article titles containing the words “environment” AND “poverty.” In this first screening, 170 articles were found. It was followed with the second screening, where the abstracts were examined to know whether or not they generate keywords containing environment in relation to the poverty variable or media, either conventional media or new media. From the second screening, 46 articles were obtained.

3.2 Data Analysis

The VOSviewer software was used to create the visualization of keyword clusters, representing different streams of research in the field. The proximity of keywords in the visualization indicates the strength of the relationship between them, and the clusters represent the distinct research themes that emerged from the literature.

Through VOSviewer, a total of 470 keywords were identified across the 46 selected articles. An appearance threshold of at least two occurrences per keyword was applied, resulting in a co-occurrence network of 55 keywords. VOSviewer v.1.6.18 can classify the keywords into different groups: keywords located adjacently to each other represent the low frequency of co-occurrence. Each cluster of keywords represents the research stream, raising the topic of the relationship between environmental and poverty issues and the media.

After the initial search, 170 articles were identified. They were screened based on their abstracts to ensure relevance, and 46 articles were finally included for analysis. The keywords of these articles were analyzed for co-occurrence, and 55 keywords that appeared together at least twice were mapped.

4. Results and Discussion

4.1 Co-Occurrence Mapping

Analysis of keyword co-occurrence is an in-depth evaluation method, giving general descriptions on the topic investigated frequently by the author. It also indicates the power of relationships between keywords, trend research in the future, and information on topics occurring (Kuzma et al., 2020; Maier et al., 2020). In this study, co-occurrence analysis was performed on 470 keywords extracted from articles exploring the interconnections between environmental issues, poverty issues, and media publication. The analysis identified 55 keywords that co-occurred in at least two instances across the 46 articles examined.

In the visualization of the keyword co-occurrence network, nodes indicate the relative number of co-occurrences for certain keywords. Different colours classify the nodes of co-occurrence networks. The arrangement of keywords on different nodes indicates that the closer the distance, the stronger is the relationship between them. The visualization of co-occurrence analysis on network and overlay configuration by VOSviewer v.1.6.18 is displayed in Figure 1 and Figure 2.

Figure 1 identifies some main keywords: poverty, poverty alleviation, environment, and sustainable development. The thickness of the line between keywords represents connection quality and power. The figure indicates a strong relationship between poverty and poverty alleviation and other important keywords such as developing countries, environmental degradation, climate change, poverty alleviation, and sustainable development. As the most dominant keyword, poverty is closely related to the keywords of environment, sustainable development, ecology, environmental economics, and environmental factor, becoming the main theme of research during 2016-2022. It confirms the finding of previous studies that there is a reciprocal relationship between poverty and environmental issues, which tends to diverge into two main schools of thought depending on the perspective of the authors (Khan et al., 2021; Malerba, 2020; Masron & Subramaniam, 2018; Setyadharma et al., 2020).

Figure 2 is the overlay visualization of keywords occurring after 2021, including control, environmental quality, news media and social media. These keywords reflect the urgency of escorting the quality of the environment and the low utilization of new media, including social media, for advocating the control of environmental quality. This issue in yellow colour also reveals the direction of research still opened widely to be developed in the future.

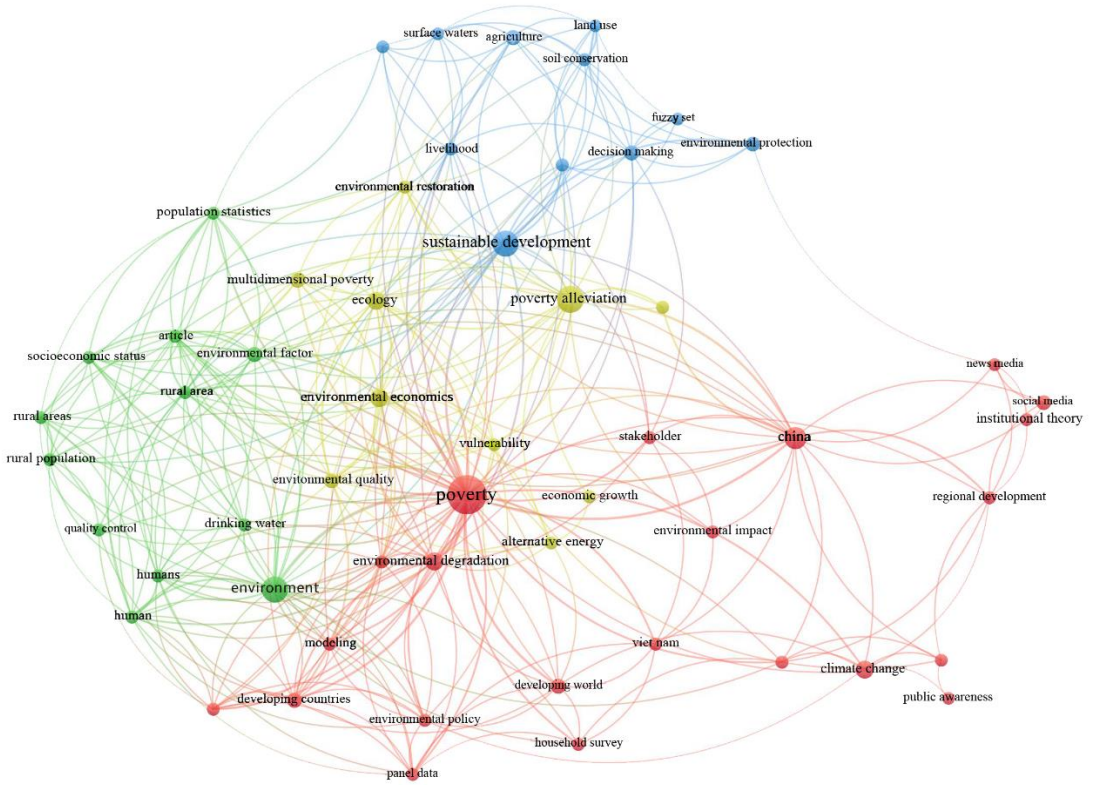

Figure 1. Visualization of the keyword co-occurrence network

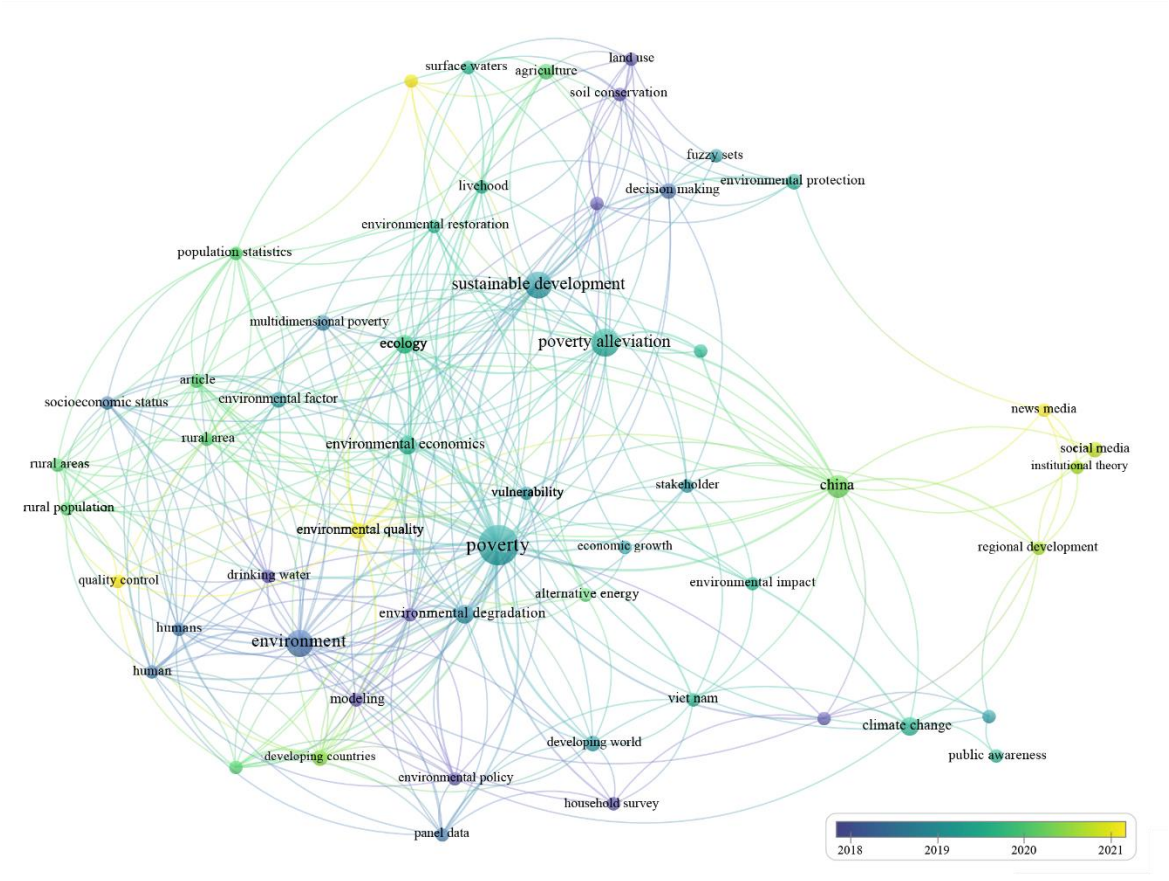

Figure 2. Visualization of the keyword co-occurrence overlay

Why are quality control, environmental quality, news media and social media not studied in one topic of the article? Firstly, it may be because of the low public awareness, including that of media stakeholders, of the reciprocal risk of environmental and poverty policies. It is in line with the finding of previous studies (Lugo-Ocando, 2019; Pegu, 2017) that media do not disclose bravely the root of problems causing natural damage with economic development due to the power relationship factor. Secondly, it may be because the media workers have inadequate comprehensive technical knowledge of the environmental vulnerability as both cause and effect of economic development policy to attempt to alleviate poverty. Thirdly, it may be because the environmental vulnerability issue is not an interesting news/information commodity and therefore does not get the media's attention. On the other hand, it can be seen that new media, including social media, can be utilized to advocate environmental policies, but only very few studies have discussed it (Chen et al., 2022; De Luca et al., 2022; Ki et al., 2022).

4.2 Thematic Clusters

Clusters were constructed based on the association between keywords. The occurrence of each keyword was estimated using a binary calculating procedure through the VOSviewer v.1.6.18 text mining technique, as presented in Table 1.

Table 1. Thematic clusters of various keywords in the environment-poverty-media nexus

Cluster 1	Cluster 2	Cluster 3	Cluster 4
1. Air pollution (2)	1. Article (2)	1. Agriculture (3)	1. Alternative energy (2)
2. Atmosphere pollution (2)	2. Drinking water (2)	2. Decision making (3)	2. Ecology (4)
3. Carbon dioxide (2)	3. Environment (8)	3. Environmental protection (3)	3. Economic growth (2)
4. China (6)	4. Environment factor (3)	4. Fuzzy sets (2)	4. Environmental economics (4)
5. Climate change (4)	5. Human (2)	5. Land use (2)	5. Environmental quality (3)
6. Developing countries (3)	6. Humans (2)	6. Livelihood (2)	6. Environmental restoration (2)
7. Developing world (3)	7. Population statistic (2)	7. Soil conservation (2)	7. Multidimensional poverty (3)
8. Environmental degradation (4)	8. Quality control (2)	8. Surface water (2)	8. Poverty alleviation (9)
9. Environmental impact (2)	9. Rural area (2)	9. Surveys (2)	9. Strategic approach (2)
10. Environmental policy (2)	10. Rural areas (2)	10. Sustainable development (8)	10. Vulnerability (2)
11. Government (2)	11. Rural population (2)	11. Topic modelling (2)	
12. Household survey (2)	12. Socioeconomic status (2)		
13. Institutional theory (2)			
14. Modelling (2)			
15. News media (2)			
16. Panel data (2)			
17. Poverty (18)			
18. Public awareness (2)			
19. Regional development (2)			
20. Social media (3)			
21. Stakeholder (2)			
22. Vietnam (2)			

Cluster 1 is dominated by spatial coverage of poverty and environmental issues and public awareness of the issues. This cluster indicates the field of research related to poverty and its relationship to the environment. Many studies have been conducted in developing countries and public awareness of the issues has been studied using various methods. The relationship between poverty and environment is represented by air pollution, atmosphere pollution, carbon dioxide, climate change, environmental degradation, and environmental impact. A significant portion of this research was conducted in developing regions, as evidenced by recurring terms such as developing countries, developing world, China, Vietnam, and regional development. Public literacy in relation to poverty issues and its relationship to environmental issues is represented by the words: government, environmental policy, news media, public awareness, social media, and stakeholder. Meanwhile, the method used to study the relationship between poverty and environmental issues in the articles is represented by the words: household survey, institutional theory, modelling, and panel data. Cluster 2 involves the environmental aspect with

influencing factors and affected areas. The influencing factors can be read from the keywords: environment factor, population statistic, socioeconomic status, and quality control. The affected areas mentioned more frequently are the rural areas, as seen from the keywords: drinking water, human, humans, rural area, rural areas, and rural population. In the period of 2016-2022, the state where environmental issues, poverty issues, and the role of media were studied most frequently in one subject of article discussion is China.

Cluster 3 is the implementation of environmental policies. The cluster identifies environmental policies supporting sustainable development and policy decision-making techniques. The area of environmental policy is reflected on the keywords: agriculture, environmental protection, land use, livelihood, soil conservation, and surface water. The decision-making techniques are represented by the keywords: decision making, fuzzy sets, surveys, topic modelling. Cluster 4 contains the topic of environmental impact risks on the people's economy and ending up in poverty and its risk-mitigating strategy. The risks of environmental impact are reflected on the keywords: multidimensional poverty, vulnerability, economic growth, and poverty alleviation. The strategy of mitigating the risks is represented by keywords: strategic approach, alternative energy, ecology, environmental economics, environmental quality, and environmental restoration.

The map of the relationship between poverty and living environmental issues lies on the reciprocal effect of the attempt to alleviate poverty through economic development, which has an impact on vulnerability and environmental damage. Therefore, this study added an analysis of topic classification viewed from the aspect of environmental policy management area: promotive, preventive, and rehabilitative. The topics of the articles were classified into those three categories. The promotive category is the content of the study to build public awareness among stakeholders to behave appropriately in relation to environmental management to meet the economic welfare demand. It is reflected on the keywords: public awareness, social media, and news media. The preventive category is the content leading more to the attempt of preventing or reducing the risk of environmental effect due to the attempt of coping with poverty. The keywords reflecting the preventive attempt are environmental protection, environmental quality, and strategic approach. Meanwhile, the rehabilitative category is a corrective attempt following the impact of damage, e.g., the words of environmental restoration.

The results of the co-occurrence analysis reveal several important research clusters. The strongest cluster connects poverty, environmental degradation, and sustainable development. This reflects the significant academic interest in how environmental degradation disproportionately affects impoverished communities, particularly in developing countries. For example, research has indicated that air pollution, deforestation, and water scarcity are key factors linking poverty to environmental harm (Khan et al., 2021). Another emerging cluster involves media and its role in framing these issues. While the media have been recognized as crucial in raising awareness of environmental and poverty issues, the analysis shows that traditional media has underutilized its potential for advocacy, especially in developing regions (Pegu, 2017). The rise of social media platforms is seen as an opportunity for marginalized groups to advocate for changes, but this research stream is still in its early stages.

To summarize, the findings reveal that while poverty and environmental degradation are well studied, the role of media, particularly social media, in addressing these issues is underexplored. Media can serve as a powerful tool for advocacy, but its potential has not been fully realized. Future research should focus on how media can be used to promote environmental sustainability and poverty alleviation, particularly in developing countries. From a theoretical perspective, this study contributes to the growing body of literature that connects environmental degradation and poverty through media. It highlights the need for a more integrated approach that incorporates media studies into the environment-poverty discourse. Practically, the study suggests that media practitioners and policymakers should work together to leverage media platforms for sustainable development advocacy.

Concerning the implications for future research, the analysis highlights a research gap in the use of media, particularly new media, for poverty and environmental advocacy. Future research should explore how social media can be optimized to promote policy changes and raise awareness of SDGs, especially in countries where traditional media is limited.

One of the primary limitations of this study is the exclusive use of the Scopus database for data collection. While Scopus is a widely recognized and comprehensive source of peer-reviewed literature, relying solely on this database can introduce certain biases. First, Scopus may not cover all relevant journals, particularly those focusing on regional or local issues that could contribute valuable insights into the environment-poverty-media nexus. For example, certain key studies published in databases like Web of Science, Google Scholar, or regional repositories might not have been included, thereby limiting the scope of the bibliometric analysis. Second, Scopus tends to prioritize more established and high-impact journals, which may marginalize emerging research areas or less mainstream perspectives. This can result in an overrepresentation of certain research streams and underrepresentation of others, such as localized studies that deal with the specific intersection of poverty, environmental issues, and media in developing regions. Finally, excluding other databases could lead to the omission of valuable interdisciplinary research that may not be indexed in Scopus but is available in fields such as sociology, political science, or regional studies, where the relationship between environmental issues and poverty is also explored. Future studies should aim to include multiple databases to provide a more comprehensive view of the literature and minimize the potential for bias in data selection.

5. Conclusions

In conclusion, all clusters are closely interrelated and interconnected to SDGs. All of them give research direction significantly on individual, social, economic, and political levels. From the four clusters, four questions were formulated for further research. Cluster 1 discusses the effect of poverty on the environment in developing countries; thus, further in-depth research needs to be conducted on the question of how poverty and environmental issues and media advocacy interrelate in the context of developed countries. Cluster 2 studies the factors affecting environmental degradation and the affected areas, the majority of which are rural areas. The question of the effect of environmental change on urban communities and the surviving strategies for the poor group should be further studied. Cluster 3 discusses the environmental policy area and its decision-making process. The result of the bibliometric analysis indicates that the integration of media into the living environmental study area has been developed rarely. Therefore, the question of how to optimize the new media, including social media, should be further studied, thereby advocating for poverty alleviation policies aligned with sustainable environmental goals. In other words, the ways of developing environment-friendly media should be further studied. Cluster 4 focuses on mitigating the risks of environmental policies in economic development and inclusive poverty alleviation. A critical question for future investigation involves how to effectively communicate and mainstream issues of environmental justice among policymakers in regional development, economic planning, and poverty alleviation efforts.

The theoretical implication of this study is the urgency to develop a more comprehensive theory or model on the relationship and interaction between issues of poverty, environment, and the role of media, especially social media. While in the more practical aspect, there is a need to identify and develop social media practices that support the campaign and mainstreaming of environmental issues for the effort of poverty eradication.

The limitation of this study lies on the use of one database, Scopus, only and its incapability of providing information on the composite research on environmental issues, poverty issues, and media in one article in Indonesia. Further research is recommended to study the Indonesia-specific context and expand the database used. In addition, further research can use a variety of meta-analysis techniques to analyze the literature related to environmental issues, poverty issues, and the new media. Practical recommendations are directed towards media professionals and community stakeholders to increase the volume of content related to environmental and poverty issues.

Author Contributions

Rutiana D. Wahyunengseh conceived of the presented idea, and developed the theoretical review. Sri Hastjarjo verified the analytical methods and performed the data collection and processing. All authors analyzed the data, discussed the results and contributed to the final manuscript.

Data Availability

The data used to support the research findings are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflict of interest.

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