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RURAL AESTHETICS AND SUSTAINABLE BEHAVIOR: A GLOBAL RESEARCH OVERVIEW

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ABSTRACT

Rural aesthetics and sustainable behavior are attracting increasing research attention globally. However, the relationship between these two fields has not been comprehensively studied. Our study aims to conduct a quantitative bibliometric analysis of the role of rural beauty in shaping sustainable behavior globally. The results of applying the Biblioshyny software of R Studio and the VOSviewer platform show trends in research collaboration, influential articles, and co-occurrence of keywords in this field. The results show an increasing trend in the number of publications with contributions from various fields and strong collaborations between European research institutions, especially the prominence of China in the Asian region since 2021. The study also points out future research directions, such as the influence of natural landscapes, culture, and rural communities on sustainable behavior and the relationship between production activities and environmental protection in rural sustainable development. The study provides a holistic, multidimensional approach and a comprehensive knowledge framework on the research development in this field, suggesting future research directions and practical applications.

Keywords: Rural beauty, rural aesthetics, cultural values, sustainable behavior, environmental sustainability.

1. INTRODUCTION

In the context of the global ecological crisis and mass tourism boom, rural aesthetics has become an important counter-mechanism for reshaping sustainable behavior in rural areas [1, 2]. The relationship between rural aesthetics and sustainable behavior has emerged as an important area of research within the broader discourse on sustainable development [1, 3]. Furthermore, as sustainability issues become mainstream, the need to balance economic interests with environmental conservation and the integrity of cultural heritage values becomes increasingly urgent. It promotes positive behaviors to protect resources, cultural values, and community development in rural areas [4]. As sustainability issues become a trend, the values of balancing economic benefits with environmental conservation and the integrity of cultural heritage values are becoming increasingly urgent, as well as promoting positive behaviors to protect resources, cultural values , and community development. Rural aesthetics is not simply about creating beauty in the landscape but also involves the process of building “harmonious beauty” through the mechanism of “aesthetic economy” and “aesthetic governance” [5]. Aesthetic value is formed from the interaction between natural elements, architecture, and local culture in the rural environment, not only assessed through the visual level of the image

but also through the way of conveying the cultural, spiritual, and social values of the rural community" [6, 7]. In addition, elements of cultural heritage or traditional agricultural activities are also preserved through the activities of the people and the community [8].

Several studies have shown that integrating aesthetic elements into rural environments can promote responsible consumer behavior and support sustainable tourism activities [9, 10]. Many studies have shown that integrating aesthetic elements into the rural environment can promote responsible consumer behavior and support sustainable activities [3]. Environmental protection actions are promoted by rural aesthetics, supporting local products and encouraging sustainable agriculture. The combination of local production and environmental protection not only creates economic value but also raises public awareness [2, 11]. Applying sustainable farming methods helps maintain ecological balance and efficiently use land and rural resources. The intersection of rural aesthetics and sustainable behavior plays a pivotal role in promoting community identity and enhancing environmental stewardship in rural areas [3, 4, 12]. Rural aesthetics include the sensory and emotional experiences derived from the beauty and uniqueness of rural landscapes, which can significantly influence sustainable practices in these communities, possibly through tourism activities and the behavior of consumers [2, 5, 13]. In addition, community values and collective consciousness are also established through sustainable activities in the community [1, 3, 14]. Furthermore, many studies have also shown how China's rural revitalization strategy emphasizes the need for an aesthetic approach to environmental design, promoting harmony between human activities and natural landscapes [3, 4, 15, 16]. Some studies show that combining ecological principles with environmental aesthetics promotes harmony between culture and conservation [11, 17]. Cultural diversity in aesthetics motivates collective action towards sustainability, as residents feel empowered to protect their heritage. At the same time, the psychological benefits from positive aesthetic environments influence individual and community behavior, promoting more sustainable practices [2, 3, 16].

Previous studies have made valuable contributions to the role of rural aesthetics and the motivation to promote sustainable behavior in communities and visitors to rural areas [3, 4, 6, 8]. Previous theoretical frameworks have been developed to assess the role of rural aesthetics in promoting sustainable lifestyles, from landscape architecture to cultural values and community behavior [3, 9]. Rural aesthetic construction and education are also considered to be innovative solutions that spread sustainable behaviour from the perspective of a rural sustainable story [18, 19]. Despite the significant advances in developing the relationships between rural aesthetics and sustainable behavior, there is still a lack of research under a holistic approach in the academic literature. Existing studies mainly focus on individual aspects without fully considering the integrative role of aesthetics in shaping sustainable behavior from different perspectives on a macro level. In addition, the global research landscape on this topic is fragmented, and the dominance of specific perspectives or methodologies in shaping our understanding of this connection. Therefore, to the best of our knowledge, this is one of the first studies to use bibliometric analysis and content analysis to provide a comprehensive picture of the relationship between rural aesthetics and sustainable behavior. Based on the data analysis, this study systematically organizes, compares, and analyzes the studies related to rural aesthetics and sustainable behavior from 1991 to April 2025 to clarify the research status, development trends, and core issues in this field from a global perspective, and synthesizes the outstanding issues in current research. The study makes an exceptional contribution to this field by pointing out the focal points of development directions for future research and thus providing theoretical and practical guidance and support for the development of research on this topic, and on the other hand, supports and promotes the dissemination and application of existing research results. The study addressed the following objectives.

1. Analyze the temporal development of rural aesthetics and sustainable behavior;

2. Use cluster analysis and evolutionary analysis to analyze the study's core hotspots and development status from 1991 to 2025;

3. Highlight the theoretical and practical implications of the analysis results and discuss the future development trends.

2. DATA AND METHODOLOGY

2.1. Software and Data

This study combined two specialized software tools, VOSviewer and the Bibliometrix package in R (via the Biblioshiny interface), to optimize the analysis process. VOSviewer stands out in building and visualizing science maps, especially in analyzing co-authorship, co-citation, and keyword co-occurrence networks, which help identify major research topic clusters and potential linkages [20]. Complementing VOSviewer, the Bibliometrix package with the Biblioshiny interface provides powerful tools for quantitative bibliometric analysis and science mapping, including performance analysis of authors, countries, institutions, and sources, as well as knowledge and concept structure analyses through methods such as co-citation analysis and bibliographic pairing analysis [21, 22]. These findings provide an overview of the network structure and detailed quantitative indicators, providing insights into emerging trends and research areas in Rural Aesthetics and Promoting Sustainable Behavior.

The data was searched from the Scopus database on April 15, 2025. We selected the Scopus database because of its extensive coverage, rigorous selection criteria, and status as a leading resource for bibliometric studies [23, 24].

While constructing the search keyword string, we combined the definition of the research concept, the selection of the main keywords and synonyms, and the application of Boolean operators to expand or narrow the search scope [11, 19]. The final result with the keyword string*: ("beauty" OR "aesthetics" OR "visual appeal" OR "design") AND ("rural") AND ("sustainability" OR "sustainable") AND ("behavior" OR "conduct" OR "practices" OR "actions") AND ("community" OR "engagement" OR "participation" OR "involvement")*

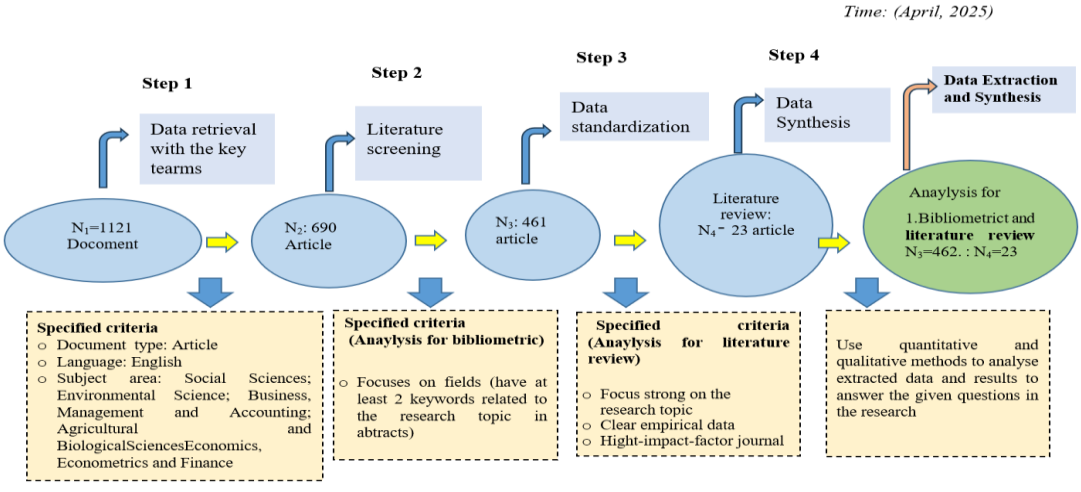

Figure 1. PRISMA diagram
Sources: Author's research following the PRISMA guidelines

The manual screening of articles was one of the research team's requirements to ensure the study's reliability and validity. The study was conducted strictly according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [25]. The four steps of "retrieval-Literature screening-standardization-synthesis" were followed. With a search string of 1121 documents, including reviews, book chapters, conference abstracts, etc., and belonging to many different fields. The study was limited to articles in English and only in a few fields (Figure 1), resulting in 690 eligible articles. These articles were manually reviewed individually based on titles and abstracts, and articles not related to this research topic were excluded to ensure that all selected articles focused on issues of rural aesthetics and sustainable behaviour. Before screening, two team members worked independently and voted to decide whether to include controversial articles after full consultation to reduce the subjectivity of the screening process. As a result, 461 articles were identified as the final research sample for biometric analysis. In addition, to support the literature review and citation process, the research team continued to screen high-quality articles, ensuring that they had in-depth content on the research topic, journals with high citation indexes, and reliable results and data sources. The results yielded 23 articles that met the criteria, and these articles support the process of analysis and citation.

2.2. Methodology

This paper adopts a mixed methods approach, combining quantitative bibliometric analysis and content analysis, to explore research trends related to rural aesthetics and sustainable consumption behavior. Bibliometric tools and metrics can be integrated with content analysis to clarify the development of research topics and identify trends and changes in research perspectives over time.

In this study, bibliometric analysis includes quantitative assessment of scientific publications through citation, co-citation, and co-keyword analysis. These methods help identify influential studies and research hotspots and explore collaborative networks among authors, institutions, and countries. At the same time, content analysis was conducted by identifying co-occurring keywords and key themes to clarify the core research issues and draw theoretical and practical implications from the analysis results. The research results will provide insights for scholars and stakeholders and provide valuable materials to support the development of rural aesthetic development strategies associated with sustainable consumption behavior in the future.

3. RESULT AND DISCUSSION

3.1. Bibliometric Analysis

This section aims to provide an overview of the development of the research topic. The countries/regions, journals, and authors, and the most influential articles are identified. At the same time, collaboration networks and global research trends are also explored. With the above results, we address the core objective of the development trend of the research topic over time.

3.1.1. Annual publications and citations

Figure 2 presents the evolution of the number of published articles (Annual publications) and the number of citations (Annual citations), providing valuable insights into the evolution of the research problem in the field from 1991 to 2025, along with a linear trend line that reflects the growth trend of the number of citations. The data shows that the number of

published articles tends to increase over time, from 1991-2011, this was the early stage of this research field that witnessed limited activity, with only a few researchers showing interest.

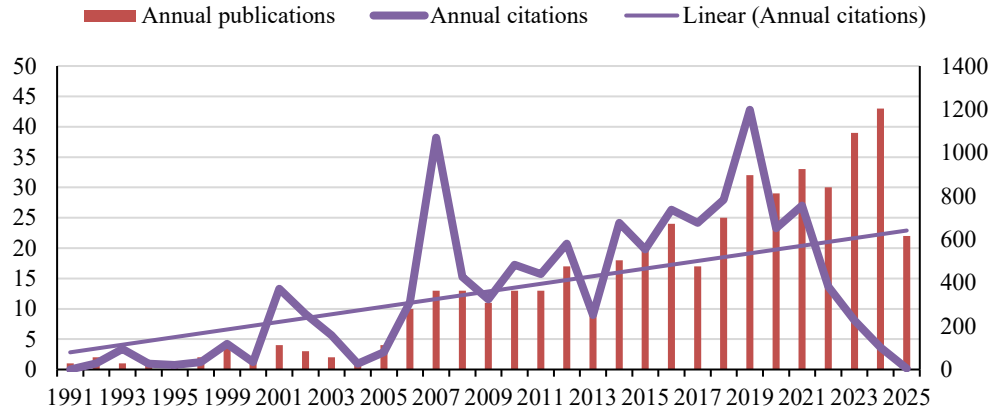

Figure 2. Yearly publication and citation counts
Sources: Author's synthesis based on data processed by Biblioshiny

The period from 2014 to 2018 marks a promising period characterized by increasing attention and interaction. Then, from 2019 to 2025, the field entered a period of significant growth, experiencing a significant increase in research output, accounting for 72.38% of the total. This result shows the growing importance and influence of the field, attracting a larger group of researchers and funding sources. These figures provide evidence of the strong growth of research and scientific publication activities in this field. The steady growth trend of the number of articles and citations from 2020 to 2025 shows that this field is receiving increasing attention and investment from the research community. In terms of the number of citations per year, 461 articles were published in this field from 1991 to April 2025, with a total of 3216 citations and 7.73 citations per article. The citation rate increased sharply from 2014 to 2021, reaching 32.64% of the total citations. This shows that the research topic has grown rapidly in recent years, receiving more attention and citations from research scholars globally. This is in line with the general trend of interest in research related to sustainable development globally and natural resources [26, 27].

3.1.2. Insights into Global Research: Journal, Author, and Country Connections

Figure 3 presents a three-field plot, illustrating the quantitative relationship between publication source (SO), authors (AU), and author country (AU_CO) in the research dataset. Visual analysis shows that journals such as Plos One, Sustainability (Switzerland), Journal of Cleaner Production, and Science of the Total Environment are the main publication channels, as shown by the thickness and density of the connection flows. Authors such as Kumar S., Wang Y., Kumar A., and Kumar V. are prominent contributors, with publications appearing in multiple journals on the list. Geographically, this aligns with previous findings on the growing prominence of Asian countries in the sustainability discourse.

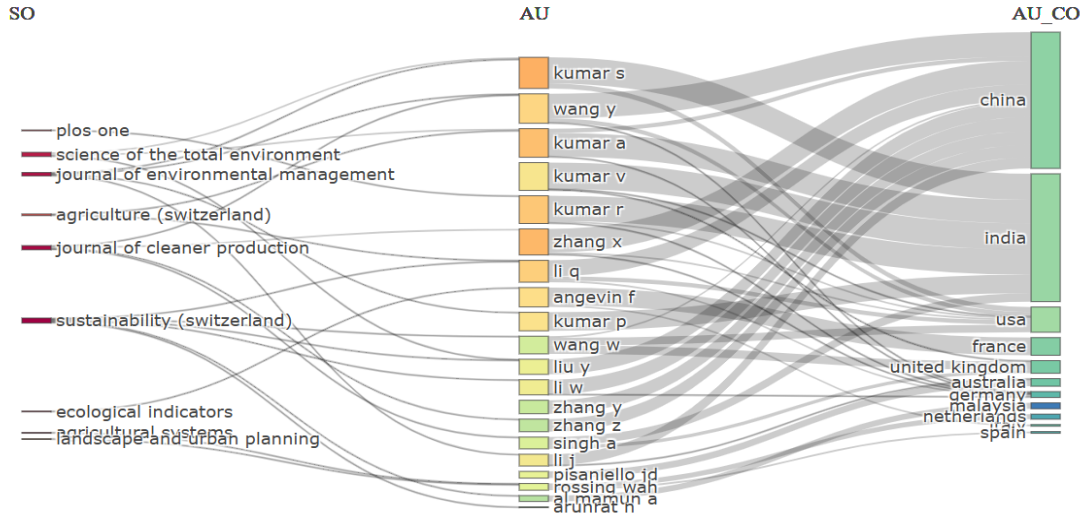

Figure 3. Three field plots of connect SO, AU, and AU-CO
Sources: Data processed by Biblioshiny

The results provide an overall picture of the structure and identify the central sources of literature and key academic centers concerned primarily with sustainability and the environment, which provides a basis for locating potential studies on the role of landscape elements, such as rural beauty, on sustainable behavior. There has been a noticeable shift in the geographical distribution of research efforts, with China and India emerging as the leading contributors.

Table 1. Top 10 papers most relevant

Paper	DOI	Total citations (TC)	TC per year	Normalized TC
Brussaard et al. (2007). Soil biodiversity for agricultural sustainability. *Agriculture, ecosystems & environment*, *121*(3), 233-244.	http://10.1016/j.agee.2006.12.013	696	36.63	8.46
Rigby et al. (2001). Constructing a farm-level indicator of sustainable agricultural practice. *Ecological economics*, *39*(3), 463-478.	http://10.1016/S0921-8009(01)00245-2	288	11.52	3.09
Lindblom et al., (2017). Promoting sustainable intensification in precision agriculture: review of decision support systems development and strategies. *Precision agriculture*, *18*(3), 309-331.	http://10.1007/s11119-016-9491-4	266	29.56	6.68
Lindemann-Matthies et al. (2010). Aesthetic preference for a Swiss alpine landscape: The impact of different agricultural land-use on different biodiversity. *Landscape and Urban Planning*, *98*(2), 99-109.	http://10.1016/j.njas.2018.11.002	225	32.14	6.01
Holt-Giménez, E. (2002). Measuring farmers' agroecological resistance after Hurricane Mitch	http://10.1016/s0167-	191	7.96	2.24

in Nicaragua: a case study in participatory, sustainable land management impact monitoring. *Agriculture, Ecosystems & Environment*, *93*(1-3), 87-105.	8809(02)00006-3			
Dogliotti et al.,(2014). Co-innovation of family farm systems: A systems approach to sustainable agriculture. *Agricultural Systems*, *126*, 76-86.	http://10.1016/j.agsy.2013.02.009	189	15.75	5.03
Aschemann-Witzel et al. (2017). Key characteristics and success factors of supply chain initiatives tackling consumer-related food waste–A multiple case study. *Journal of Cleaner Production*, *155*, 33-45.	http://10.1016/j.jclepro.2016.11.173	181	20.11	4.54
Lindemann-Matthies et al. (2010). Aesthetic preference for a Swiss alpine landscape: The impact of different agricultural land-use on different biodiversity. *Landscape and Urban Planning*, *98*(2), 99-109.	http://10.1016/j.landurbplan.2010.07.015	168	10.50	4.52
Tittonell (2014). Livelihood strategies, resilience and transformability in African agroecosystems. *Agricultural systems*, *126*, 3-14.	http://10.1016/j.agsy.2013.10.010	163	13.58	4.33
Viscarra Rossel et al. (2016). Soil sensing: A new paradigm for agriculture. *Agricultural systems*, *148*, 71-74.	http://10.1016/j.agsy.2016.07.001	160	16.00	5.21

Sources: Author's synthesis based on data processed by Biblioshiny

Table 1 lists the 10 most influential scientific articles in the review, ranked based on citation indices. The article by Brussaard et al. (2007), published in Agriculture, Ecosystems & Environment, is at the top with 696 total citations (TC), a TC per Year of 36.63, and a Normalized TC of 8.46. Other articles in the list also show significant influence, such as the work by Rigby et al. (2001) on Ecological Economics (288 citations), Lindblom et al. (2017) on Precision Agriculture (266 citations), and Lindemann-Matthies et al. (2010) with 225 citations. In addition, the analysis results show that these articles span a wide range of related fields such as Agricultural Systems, Ecological Economics, Agriculture, Ecosystems & Environment, Journal of Cleaner Production, and Landscape and Urban Planning, with publication dates spanning from 2001 to 2017. Indicators such as TC per Year and Normalized TC provide additional insight into the continuing or relative impact of the works over time, with works and authors such as Brussaard et al. (2007), Viscarra Rossel et al. (2016), and Lindemann-Matthies et al. (2010) having high citation counts and standardized citations compared to other authors.

The results support and underpin the core paper and point out that these valuable references highlight foundational research on topics ranging from agroecology to landscape planning and explore the links between rural landscape elements and sustainable behavior.

3.1.3. Co-authorship countries/area

VOSviewer software was used to analyze the overlay visualization of co-authorship relationships between participating countries/regions (Figure 4). The colors of the nodes and links reflect the time trend based on the average publication year, from blue/purple

(approximately before 2016) for older publications, gradually moving to green and yellow (approximately 2022-2025), representing the most recent publications. Analysis shows that, in the early stages of the analysis time frame (indicated by blue/purple), countries such as the United Kingdom, the United States, Canada, Italy, and several other European countries were active research centers.

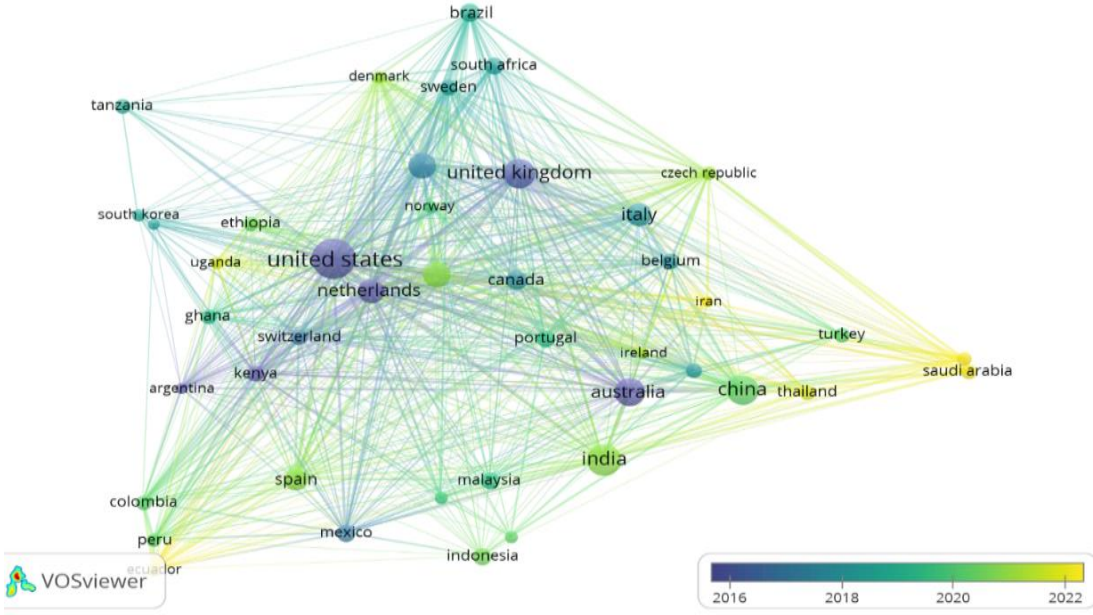

Figure 4. Map of the scientific collaboration network between countries
Sources: Data processed by VOS-viewer

However, the presence of prominent green and yellow nodes indicates that research activity during 2018–2022 is increasing and becoming more vibrant in Asian countries such as China, India, Malaysia, Thailand, and countries such as Turkey, Iran, and Saudi Arabia. This indicates a trend of expanding or shifting the focus of research to these countries, reflecting the growing interest and investment in the regions mentioned above in recent times. The dense network of connections also indicates a high level of international collaboration in this research area. There has been a noticeable shift in the geographical distribution of research efforts, with China and India emerging as the leading contributors. This aligns with previous findings on the growing prominence of developing countries in the sustainability discourse [28, 29]. The collaborative networks established in this field underscore the importance of international collaboration, which is essential to address today's complex sustainability challenges. Notably, there is a trend of expansion and diversification in global collaboration, extending beyond the traditional academic centers of North America and Europe, especially to developing countries in the Asian region with resource constraints and urban pressures.

3.2. Content analysis

Content Analysis in bibliography is a method of systematically decoding and coding the content of scientific works (e.g., keywords, abstracts) to identify the main topics, development trends, and latent knowledge structures of a research field [30]. Our study used co-keyword analysis and Theme Hotspot Analysis to detect important content based on the connections between clusters and prominent co-occurrence in keyword clusters.

3.2.1. Theme Hotspot Analysis

The topic density analysis aims to identify research hotspots related to sustainable behavior and rural aesthetics. VOSviewer software uses the similarity visualization method to detect and visually locate different clusters on the map, effectively mapping each keyword in the analysis. The network of nodes and beside nodes shows the presence of diverse and important topics in scientific publications related to rural aesthetics and sustainable behavior, which are trending to attract the attention of many research scholars.

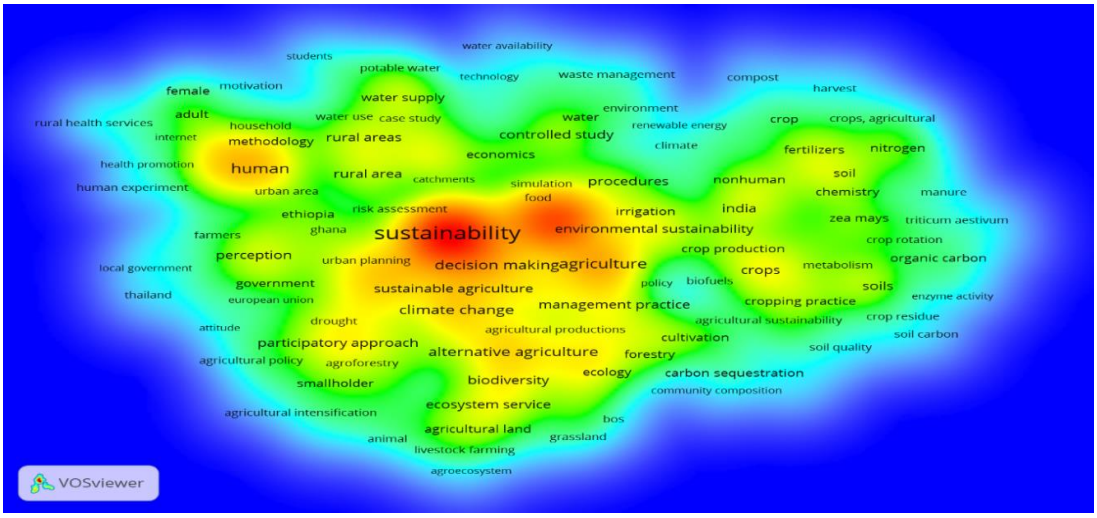

Figure 5. The theme density of the keywords
Sources: Data processed by VOS-viewer

However, when looking at the occurrence, it is clear that terms such as “sustainability”, “human”, “rural area(s)”, and “agriculture” hold a prominent position, with “sustainability” being the centre and the remaining terms closely related around it. In addition, other terms such as “decision making”, “environmental sustainability”, “perception”, “ecosystem service”, “management practice”, “climate change”, “food”, “water”, and “farmers” also appear frequently and form clusters in the documents. This shows the diversity of connections and recognition as an interdisciplinary field of study, where scholars have conducted in-depth investigations on many aspects, from environmental and agricultural techniques to socio-economic factors. Furthermore, there is a particular interest in exploring human factors (perception, decision-making) and interactions with the natural environment and agriculture (agriculture, environmental sustainability, ecosystem services, biodiversity) in rural areas. It is the focus on perception and ecosystem service values – which may include aesthetic values and the role of rural beauty – about decision-making and management practices towards sustainability that opens up the approach to further understanding the role of rural beauty in sustainable behaviour (Figure 5).

3.2.2. Keywords Co-occurrence Network

We used VOSviewer in the keyword co-occurrence analysis, with a minimum threshold of 10 occurrences set to select the most important keywords. As a result, 89 keywords (from a total of 4269) satisfied this condition and were used for the co-occurrence analysis. Based on the color of Figure 6, this study identified five main topic clusters, highlighting the knowledge structure in the field of rural beauty and sustainable behavior research (Table 2). The content achieved through the clusters not only provides an overview approach but also creates a basis

for in-depth exploration of how factors such as rural beauty perception and landscape aesthetic value (implicit in the topics of awareness and ecosystem services) can be studied as a factor influencing sustainable behaviour of people, communities, and individuals.

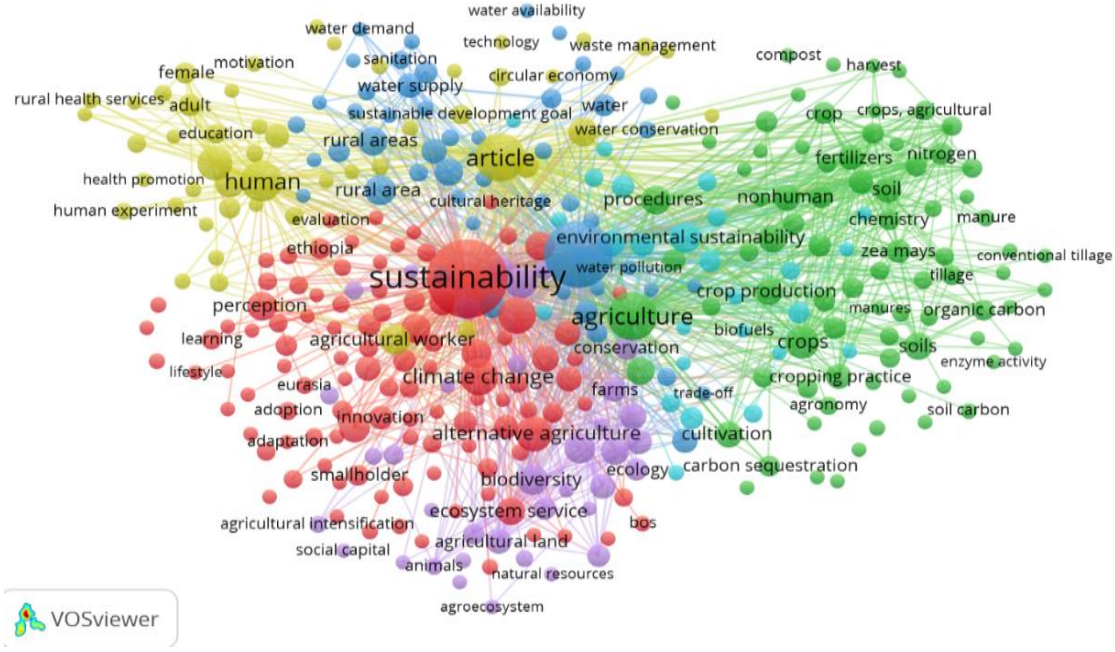

Figure 6. The map of keyword co-occurrence
Sources: Data processed by VOS-viewer

Cluster 1: Sustainable agriculture and ecosystem development (Red), the center related to sustainability; this cluster is also linked to agriculture, climate change, and alternative agriculture and converges concepts expressing the value of the environment as well as culture, with the keywords representing ecosystem service and cultural heritage. Furthermore, the aesthetic landscape values , as mentioned in the keywords adoption, innovation, and lifestyle, go with the ecosystem service and cultural heritage, showing that this problem category is also related to the sustainable behavior side.

Cluster 2: Land Resource Management and Sustainable Agricultural Production (Green): This cluster focuses on technical aspects; the cluster includes the keywords crops, soil, cropping practice, agronomy, and fertilizers. In this cluster, agronomic practice is described as a manifestation of conscious practice, that is, the details of behavior that affect the rural environment's physical characteristics and landscape appearance. The keywords of this cluster relate to resource management and agriculture with traditional agronomic practices. This practice creates either a direct impact or a shaping of the rural landscape. Sustainable behavior is demonstrated through practice choices in this cluster.

Cluster 3: Human Factors, Perception, and Behavior (Yellow). This cluster places the Human factor at the center, linking it to important psycho-social processes. The keyword Perception – a fundamental component of aesthetic perception – appears together with Motivation and behavior. This cluster still revolves around the human factor. Perception is the gateway to experiencing rural beauty. The appearance of learning and education shows the potential of raising awareness of landscape values (including aesthetics) to influence motivation and promote sustainable behavior.

Cluster 4: Rural Water and Sanitation Management (Blue). This cluster gathers keywords related to resource management and environmental quality in rural areas, including Water availability, Water conservation, Water pollution, Waste management, and sanitation. Effective management of these elements is not only important in terms of resources but also affects the quality of the living environment and rural landscape amenities, with Water conservation representing a specific sustainable behavior in sustainable development.

Cluster 5: Socio-Economic Systems and Conservation (Purple). Linking social capital to natural resources, ecology, agroecosystem, and conservation actions, this cluster reflects studies of human-environment interactions. Conservation is a core sustainable behavior, and its co-occurrence with Social capital suggests the role of communities in conserving ecosystem values, including shared aesthetic values. In addition, the natural resource values of the agroecosystem are linked to social capital, which creates a deep connection and influences sustainable behavior.

Table 2. Cluster content and representative keyword

No.	The color of the cluster/number of keywords represents	Representative Keywords / Frequency of Appearance
Cluster 1: Sustainable agriculture and ecosystem development	Red- 31	Sustainability (56), agriculture (30), climate change (17), alternative agriculture (16), biodiversity (23), ecosystem service (21), adoption, innovation(18), agricultural worker (14), lifestyle (15), cultural heritage (21)
Cluster 2: Land Resource Management and Sustainable Agricultural Production	Green- 26	Crops (10), crop production (31), soil (21), soils (32), cropping practice (28), agronomy (20), nitrogen (18), fertilizers, manure (19), organic carbon (21), soil carbon (14), enzyme activity (19), conventional tillage (21), tillage (23)
Cluster 3: Human Factors, Perception, and Behavior	Yellow-17	Human (12), Health promotion (6), Female (8), Motivation (9), Education (12), human (12), Experiment (4), Perception, technology (9), article (4), behavior (13)
Cluster 4: Rural Water and Sanitation Management	Blue-14	Water availability (21); Water conservation (32), Water pollution (22), Waste management (13); Sanitation (17), rural areas (29).
Cluster 5: Socio-Economic Systems and Conservation	Purple-12	Social capital (29), natural resources (21), animals (13), agroecosystem (17), agricultural land (19), farm (18), ecology (21), conservation (26).

Sources: Author's research based on data processed by VOS-viewer

3.2.3. Rural aesthetics and sustainable behavior: A keyword and theme hotspot analysis with future research direction

Research results through co-keyword analysis and Theme Hotspot Analysis have highlighted important research themes and key trends in the connection between rural aesthetics and sustainable behavior. Five prominent keyword phrases cover the core themes of sustainability, environmental impact, human dimension, and social-ecological interactions. Cluster 1, the most significant number of keywords, acts as a development hub with

transformation levers and sustainability as the guiding role, emphasizing the important role of sustainability as a driving force in promoting agricultural activities and rural development. These findings are in agreement with previous studies on the development trends of the world and in rural areas [3, 4, 26, 31]. Furthermore, the results also confirm the relationship linking aesthetic values with sustainable practices, suggesting that perceptions of beauty in rural landscapes can influence decision-making and behavioral change toward sustainability [1, 4, 32]. Notably, the findings indicate that the sustainability factor is always at the center of current research, with related keywords such as agriculture, climate change, and biodiversity frequently appearing in studies related to rural aesthetics [33-36]. In particular, ecosystem services, an important concept in sustainability studies, are also mentioned many times, indicating a strong connection between natural elements and sustainable behaviors in rural communities. The relationship between human perception and sustainable behavior is considered one of the important links in line with previous studies [4, 27, 33]. When people's perception of aesthetic values is higher, they will tend to participate actively in environmental protection and sustainable development activities. A possible course of action would be to raise awareness among people and communities about sustainable development and the fact that they are the individuals who create long-term sustainable value in rural areas. In addition, the relationship between cultural heritage and sustainable behavior is also clarified in this study. The keyword phrase "cultural heritage" appeared in the analysis, reflecting the strong connection between landscape aesthetics and cultural values, especially in rural areas [4, 37, 38]. Previous studies have shown that cultural heritage is an element that needs to be protected and developed, and creates a strong driving force for sustainable activities [4, 5]. We strongly recommend exploiting, developing, and preserving cultural heritage, whose values are considered the soul of the countryside, stimulating as well as the premise for sustainable behavior, which includes not only material elements but also non-material values. A significant effect on sustainable behavior with the role of social capital and natural resources also shows an important aspect in this research: the impact of social factors on landscape protection behavior [3]. The findings suggest a potential impact on communities with high social capital and cultural capital, environmental settings where relationships and cooperation between individuals are strengthened, and the ability to implement and coordinate landscape protection actions more effectively [39, 40]. This finding supports previous research on resource advantage as one of the factors supporting effective sustainable behaviors. Connections between individuals and organizations in communities can promote the protection and maintenance of the beauty of rural landscapes, thereby contributing to sustainable practices in agriculture and community development. A key suggestion is that to support sustainable behaviors, rural aesthetic factors are considered an important factor in development strategies. In addition to material values, cultural, heritage, and community values are also of profound value in developing this research direction [37, 40]. The results of the content analysis also highlight the shift in research in recent years, from a focus on natural and technical factors to exploring the deeper connection between aesthetic factors and sustainable behaviors. This reflects a change in research perspective, in which rural beauty and aesthetics are not only viewed as peripheral factors but also as an integral part of sustainable development strategies. Our results provide rich ideas for researchers in this field. We propose to expand the research time frame and adopt long-term development perspectives to capture the general characteristics of the field. At the same time, the use of various research methods, such as expert interviews and empirical studies, will enhance the reliability and accuracy of the results. Besides, focusing on a specific group of topics and each specific subject and performing a deeper analysis of key concepts will help identify future research paths and development directions, thereby supporting researchers in developing their research plans.

4. CONCLUSION, IMPLICATION AND PROSPECTS

Overall, this research contributes to the understanding of rural aesthetics, promoting sustainable behavior under comprehensive bibliographic and content analysis. Research results have opened up new opportunities and challenges in exploiting and applying aesthetic values to global sustainable development strategies. The trend of cooperation and dominance is expanding from European and North American countries to Asian countries, notably with the role of China and India, which also reflects the changing perception of the sustainability story of developing countries. Aesthetic values not only include visual beauty but also contain cultural, spiritual, and social elements, such as farming and production activities, that can be a strong bridge between people and environmental behaviors. Furthermore, by emphasizing the aesthetic value and its impact on human behavior, this study proposes that raising awareness and preserving cultural heritage, preserving traditional values, and especially improving factors of social capital and natural resources are also keys to promoting this relationship. Future research needs to be able to exploit and expand the scope of aesthetic research from natural and technical factors to deeper values of aesthetic perception and behavioral motivation. Furthermore, future studies on strategies and ways in which rural aesthetics can contribute to sustainable development strategies to exploit, preserve, and maintain rural aesthetic values from many approaches and contributing aspects. Furthermore, the construction and development of economic, political, infrastructure, and social capital factors also require strategies to promote effective solutions in developing relationships in human cognition and behavior. The exploitation of rural aesthetic value is not just an auxiliary element in sustainable development but an indispensable part of forming comprehensive sustainable development policies. Although this study has pointed out the main trends in combining aesthetics with sustainable development, social, political, and economic factors still need to be considered more deeply to better understand this relationship and create more practical and effective solutions. Therefore, rural aesthetics is not only an auxiliary factor in sustainable development but also an indispensable part of forming comprehensive sustainable development policies. Further research could expand on the impact of rural aesthetics on natural and social resource conservation strategies, contributing to building a more sustainable future for all communities.

Limitations of research: This study has some limitations related to using only the Scopus database, which may limit the richness and comprehensiveness of the results. In addition, selecting only English articles may miss valuable studies in other languages. Therefore, future studies should expand the scope of data and consider more diverse document sources to achieve more comprehensive and reliable results.

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TÓM TẮT

MỸ QUAN NÔNG THÔN VÀ HÀNH VI BỀN VỮNG: TỔNG QUAN NGHIÊN CỨU TOÀN CẦU

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Mỹ học nông thôn và hành vi bền vững đang thu hút sự chú ý nghiên cứu ngày càng tăng trên toàn cầu. Tuy nhiên, mối quan hệ giữa hai lĩnh vực này chưa được nghiên cứu một cách toàn diện. Nghiên cứu của chúng tôi nhằm thực hiện một phân tích bibliometric định lượng về vai trò của vẻ đẹp nông thôn trong việc hình thành hành vi bền vững toàn cầu. Kết quả của việc áp dụng phần mềm Biblioshiny của R Studio và nền tảng VOSviewer cho thấy xu hướng trong hợp tác nghiên cứu, các bài viết có ảnh hưởng và sự đồng xuất hiện của các từ khóa trong lĩnh vực này. Kết quả cho thấy xu hướng gia tăng về số lượng công trình xuất bản với sự đóng góp từ các lĩnh vực khác nhau và sự hợp tác mạnh mẽ giữa các tổ chức nghiên cứu châu Âu, đặc biệt là sự nổi bật của Trung Quốc ở khu vực châu Á từ năm 2021. Nghiên cứu cũng chỉ ra các hướng nghiên cứu trong tương lai, chẳng hạn như ảnh hưởng của cảnh quan thiên nhiên, văn hóa và cộng đồng nông thôn đối với hành vi bền vững và mối quan hệ giữa các hoạt động sản xuất và bảo vệ môi trường trong phát triển bền vững nông thôn. Nghiên cứu cung cấp một cách tiếp cận toàn diện, đa chiều và một khuôn khổ kiến thức đầy đủ về sự phát triển nghiên cứu trong lĩnh vực này, đồng thời đề xuất các hướng nghiên cứu trong tương lai và các ứng dụng thực tiễn.

Từ khóa: Vẻ đẹp nông thôn, mỹ học nông thôn, giá trị văn hóa, hành vi bền vững, bền vững môi trường.