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Article

Analyzing the Worldwide Wetland Parks Research: A Spectral-Cluster Algorithm Latent Semantic Index Approach

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Abstract: This study reviews worldwide wetland park research from 1996 to 2022. A bibliometric analysis is conducted on 591 wetland park studies indexed in the Web of Science and Scopus databases. The study utilizes CiteSpace and VOSviewer tools to visualize and explore influential research focuses, themes, directions, and countries. The citation burst indicates that from 1996 to 2022, research on wetland parks transited from exploring basic community structures to complex ecosystem service assessments and the formulation of management strategies. Furthermore, over the past three years, wetland park research has seen a significant surge in studies investigating water quality, ecosystem services, and spatiotemporal analysis. Notably, the three most frequent keywords in research on wetland parks were China, South Africa, and biodiversity. These keywords reflect regions that enhance biodiversity via wetland parks. The spectral-clustering algorithm identifies carbon sequestration as a research focus, highlighting the vital role of wetlands in the carbon cycle. Most authors work in developed countries' institutions, but some are from developing countries like China, South Africa, and India. The findings suggest that economic development is crucial in wetland park construction and significantly influences related research. Developed countries may offer more PhD positions to developing countries' researchers in the field and raise their awareness about wetland conservation. Given the holistic requirements of wetlands, this research recommends that educators should adopt an interdisciplinary approach in the future when nurturing wetland staff. Additionally, the study maps out the primary areas of interest in wetland park research, including environmental science, ecological economics, forestry, wetlands, tourism, and management. New artificial intelligence and digital technologies should be developed for wetland park research. This study fills a research gap: quantitative and visualized knowledge-mapping and bibliometrics on wetland parks are scarce. Additionally, no previous study has explored the relationship between wetland park research and the economic development of countries.

Keywords: bibliometrics; biodiversity; water quality; CO_2 circularity; land use

Citation: Zeng, L.; Li, R.Y.M.; Zeng, H. Analyzing the Worldwide Wetland Parks Research: A Spectral-Cluster Algorithm Latent Semantic Index Approach. *Buildings* **2024**, *14*, 1315. https://doi.org/10.3390/buildings14051315

Academic Editor: Derek Clements-Croome

Received: 9 March 2024
Revised: 2 May 2024
Accepted: 3 May 2024
Published: 7 May 2024

1. Introduction

1.1. Research Background

1.1.1. Wetland Ecosystems Offer Many Benefits but Currently Face Threats

The wetland is a special ecosystem, called a wetland ecosystem [1]. Wetlands play an important role in maintaining the worldwide ecosystem balance, mitigating climate change, enhancing global environmental and ecological sustainability, and promoting human well-being [2,3], economic development [4,5], and cultural heritage [6,7]. Although wetlands only account for approximately 6% of the surface area of land on Earth, 40% of plant and animal species live or breed in them [8]. Consequently, wetland ecosystems are critical in maintaining biodiversity in the world [2]. They also play an essential role in water management, including ecological water storage, water supply, flood control, and water purification [8]. Constructed wetlands are ideal for addressing water circulation issues [9]. Small and dispersed urban wetlands contribute significantly to carbon storage [10]. Furthermore, wetlands are valuable to humans [11], producing food and high-quality raw materials for industrial and agricultural production. Moreover, wetlands have the potential to produce aquatic products, fruit and vegetable products, and green food; consequently, they can be developed into agricultural production regions, resulting in economic benefits. Additionally, they can foster ecotourism, thus boosting local economies [5]. Finally, the experiential cultural benefits of wetlands encompass physical, spiritual, mental, and intellectual aspects. For example, the Swedish tradition of friluftsliv emphasizes the sensation of being connected to the landscape, wetlands attain physical restoration, spiritual wholeness, and aesthetic pleasure. The interdependence of environmental spaces and cultural practices gives rise to wetlands' place-related cultural ecosystem services, such as providing a strong local identity, high-quality outdoor experiences, enhanced educational capabilities, and opportunities for commodifying and monetizing natural phenomena. All these services result in forming a one-of-a-kind wetland area [7].

Although wetlands provide numerous benefits, they are frequently threatened by human activities such as drainage, construction, pollution, overfishing, resource overexploitation, the introduction of invasive species, and the impacts of climate change [12]. According to the United Nations [8], a reduction in global biodiversity and ecosystem diversity continues due to rapid human population growth, unsustainable production and consumption, and the adverse impact of climate change [13]. The rate of the disappearance of wetlands is three times that of forests, making wetlands the most threatened ecosystems on earth. Since 1970, 35% of the world's wetlands have disappeared [8], mainly in Europe, the United States, and China [14]. Between 1700 and 2020, more than 50% of wetlands in the United States, Europe, Central Asia, India, China, Japan, and Southeast Asia disappeared [13]. Five countries account for more than 40% of global wetland loss: the United States (15.6% of the total), China (12.6%), India (6.5%), Russia (4.5%), and Indonesia (4.1%) [13]. To protect the diverse fauna in urbanized wetlands, raising awareness of and increasing participation in wetland protection are likely to be the most effective methods of enhancing wetland protection [15].

1.1.2. Wetland Parks Are Necessary for The Protection of Wetland Ecosystems

Wetland parks are natural or artificially formed parks that combine wetland ecological functions and typical park features, achieving the goals of environmental protection, science education, leisure, and recreation [16]. Since a wetland park includes a certain proportion of wetland area, it has important functions in conserving water sources, purifying water, storing floods, controlling flooding, fighting droughts, regulating regional climates, and increasing biodiversity [4,15]. Wetland parks feature a combination of resource protection and rational utilization in wetland ecosystems, which includes the safeguarding and using key resources, including abiotic, biological (such as wild animals and plant resources), and cultural resources [15,16]. Thus, wetland parks are important to wetland ecosystems. The benefits of wetland parks to wetland ecosystems are outlined below.

First, some scholars have reported that wetland parks protect wetland ecosystems. This protection mainly includes systematically protecting ecosystem structure, ecological processes and characteristics, ecological functions, and biodiversity [15,17]. For example, Joubert et al. [18] pointed out that there is high biodiversity value due to subtropical grassland ecological networks in wetland parks. Additionally, wetland parks effectively protect the ecological landscape and culture [19]. The protective role of the wetland park can promote the formation of a composite wetland ecosystem with a complete structure and effective functions [17]. Therefore, wetland parks offer significant benefits in protecting wetland-ecosystem water resources, maintaining regional water balance, regulating regional climate, and increasing biodiversity [15,16].

Second, science popularization and education about wetland ecosystems can protect wetland ecosystems, to a certain extent, on account of public participation. These popularization and education efforts mainly rely on the natural and human resources in a wetland park [20] to protect a wetland based on the themes of ecological-function displays, popular-science knowledge, scientific research results, protection achievements, rational-utilization models, and cultural displays [4,21]. Science popularization and education raise public awareness about wetland protection and environmental protection by enabling the personal experience of a wetland in a wetland park [22].

Third, wetland parks promote the sustainable development of wetlands through the rational utilization of resources. As an illustration, Li and Li [23] observed that wetland parks protect wetland ecosystems by utilizing wetland resources and avoiding unreasonable reductions in wetland areas [24]. Wetland parks are established to protect wetland resources. Under the premise of system protection, resources are combined with science popularization and education, while considering the market demand and ecological carrying capacity. The government and park managers can develop rational activity projects, including environmental green planting, ecological sightseeing, recreation experiences, leisure vacations, health care, expanded training, and a cultural experience [25,26]. Furthermore, the rational utilization of resources can improve the income of local surrounding communities and increase funding sources for wetland protection [27,28]. Such rational utilization can also change the ideological concepts of a community and encourage people to protect wetlands [29] spontaneously.

1.1.3. Wetland Park Research Is Increasing in International Academia

Rapid urbanization poses significant challenges to wetland parks and other wetland resources. Therefore, there is considerable scholarly interest in wetland parks, with numerous studies conducted in different locations. For example, Tait and Brunson [30] examined the Rocky Mountain National Park ecosystem in the United States in a case study on cooperative wetland management. Furthermore, a comparative analysis of two urban wetland parks in Columbus, Ohio and Naples, Florida, USA, examined changes in habitat and downstream water quality [17]. Employing a global biodiversity perspective, Hart et al. [31] and Lin et al. [32] surveyed South Africa's iSimangaliso Wetland Park and showed that species protection should be aimed at different habitats or non-biohazardous substances of water bodies to enhance species diversity. Additionally, some studies have investigated biodiversity, temporal and spatial distribution, and pollution control in Taihu Lake National Wetland Park [33], Tangdao Bay National Wetland Park in Qingdao [34], and Liupanshui Minghu National Wetland Park [35] in China. Their findings suggested that some chemical aspects (i.e., pH and NO_3-N content) as well as water temperature, land use, and biodiversity evaluation and design should be considered to provide a scientific basis for biodiversity protection and pollution control. Further, Van Cuong et al. [36] reported increased biodiversity after water resource management was enhanced in Vietnam Wetland National Park. Rivers in urban wetland parks are disrupted by fluctuations in water levels caused by flooding and rainfall; floodplains shrink due to human activities such as straightening and hard revetment, and water erosion and fragmented wetland habitats result from water-conservation projects. Consequently, managing these problems is of paramount importance to protect wetland parks.

Wetland parks are blue-green spaces that come into close contact with humans and offer significant ecological and cultural benefits [37]. Wetland parks are an effective measure for protecting natural wetlands, thus not only achieving environmental protection and enhancing biodiversity but also enhancing the socio-economic and cultural value of wetland ecosystems. Nevertheless, previous research findings have some shortcomings: Most scholars have mainly discussed these shortcomings from the perspective of a single discipline, namely, landscape, ecology, or sociology. First, from the perspective of landscape science, research mainly involves the current development and restoration of wetland parks [38], planning and design [35], plant configuration design [34], et cetera. Second, the sociological perspective includes research on wetland value [37], wetland healthcare [3], and the ecological education function of wetland parks [29]. Mitsch, Zhang, Griffiths, and Bays [17] reported that these parks serve as natural laboratories for studying biodiversity and ecosystem function, promoting scientific research that leads to a deep understanding of wetland ecosystems. Third, the ecological perspective includes the ecological processes of wetlands [37], their structure and function [33], biodiversity [31,32], and wetland construction [30]. Further, Song et al. [39] indicated that reducing water pollution, protecting biodiversity, maintaining the structural integrity of wetlands, practicing erosion regulation, decreasing flood hazards, and managing stormwater are important measures for protecting wetland parks. As a composite product of 'wetland' and 'park', the coordination problem of wetland park ecological protection and utilization has long attracted academic attention and discussion [21,40,41]. However, few scholars have systematically studied wetland parks from an international perspective based on the viewpoint of multidisciplinary integration.

1.2. Research Objectives, Gaps, and Structures

Wetland parks enhance biodiversity, improve natural water systems, and boost carbon capture. Wetland parks face substantial changes that are, in some cases, irreversible. Consequently, these changes have significant implications for future land use. Therefore, this study intends to evaluate recent investigations into this phenomenon. Researchers usually utilize experiments [31], surveys [42], case studies [17,26,33], big data analysis [43], geographic information system (GIS) technology [20], and the analytic hierarchy process [20,42] in research on wetland parks. Thus, the overarching aim of this study is to conduct a comprehensive and systematic analysis of studies on wetland parks from 1996 to 2022 using knowledge mappings to fill the research gap. Furthermore, this study aims to determine the knowledge structure, current research focus, and research directions of studies on wetland parks. Therefore, the contributions of this study are as follows: (1) The literature from the past 27 years is utilized to show the characteristics of wetland park-related research. The analyzed publications are sourced from two of the most popular academic databases [44]: Web of Science (WoS) Core Collection and Scopus. (2) CiteSpace software of V.6.1.R6 is used to identify hot topics and research directions through citation-burst analysis of high-frequency keywords. Research topics that deserve great attention are summarized, laying the foundation for future wetland park research. (3) VOSviewer software of V.1.6.17 is used to categorize the data based on co-authorship, country/region, author, co-citation of references, and co-occurrence of keywords to identify the knowledge structure, key periods, countries, and influential research articles through visual maps. (4) This study employs bibliometric techniques to investigate research on wetland parks from 1996 to 2022. It identifies research trends, assisting researchers in identifying new research topics. This study innovatively applies quantitative and visual knowledge maps and bibliometrics to study wetland parks from an international academic perspective. Additionally, considering globalization and the international significance of wetland parks, this article innovatively explores the relationship between wetland park research and national economic development.

Section 2 describes the research methods, research samples, and data analysis approaches utilized in this study. Subsequently, Section 3 outlines the results of research foci, clusters, and influential countries regarding research on wetland parks. Section 4 then discusses the results, while the Section 5 concludes this research article.

2. Research Methods

2.1. Bibliometric Search

Most wetland park research investigates and evaluates the biological and non-living resources, land use, planning and design, and construction of physical facilities [32]. Few or no research provides an overview of this field of study. This research aims to fill this gap. Besides offering essential measures for evaluating academic performance via citation analysis, bibliometrics is employed to identify and explore the research topics, co-authors and co-word analyses within certain subject areas. It has been applied in various research areas, such as construction safety [45], tourism [46] and occupational safety and health [47]. To perform a quantitative analysis of publication information, this study used articles indexed in Scopus and WoS to investigate publication year, document type, author, institution, country, and region [44].

The year 2022 was vital to global wetland protection. 2 February 2022, was the first United Nations World Wetlands Day [48]. In 2021, the United Nations [48] announced the 2nd of February every year as a World Wetlands Day [48]. The theme in 2022 was 'Wetlands Action for People and Nature' [49], which aimed to understand the impact of wetlands on the ecological environment and human wellbeing. Consequently, this manuscript mainly selected data from articles about wetland parks published in WoS and Scopus before 2 February 2023, which was World Wetlands Day [8]. This investigation aims to explore the research results and the evolution of scholarship on wetland parks from the perspective of international and worldwide academia one year after the first United Nations World Wetlands Day.

The inclusion and exclusion criteria used to obtain wetland park research are outlined in Figure 1. The criteria included keywords, databases, search terms, language, document types, and timespan [44]. This study only covered Web of Science (WoS) and Scopus, the two most authoritative academic literature sources. Grey literature was excluded because it usually has low scientific quality, and much of the work has been done by non-specialists and inexperienced authors [50]. Because this study examined wetland parks, we employed the TITLE-ABS-KEY (wetland* park*) in Scopus on 2 February 2023 and selected English articles and reviews. Consequently, 597 documents were included. The same topic and criteria were used in the WoS Core Collection to perform a search, namely, TS = (wetland* park*), resulting in 379 documents. For the preliminary screening, we eliminated 166 irrelevant articles whose research content and purpose did not fall within the scope of wetland parks. Then, 490 documents obtained from Scopus and 320 documents from WoS remained. 810 original research documents were obtained and converted from the two databases using CiteSpace V.6.1.R6. For the secondary screening, some of the same articles were indexed from Scopus and WoS, but only one was needed for the analysis. Therefore, we eliminated 219 duplicate records. Finally, 591 documents were included in the study sample.

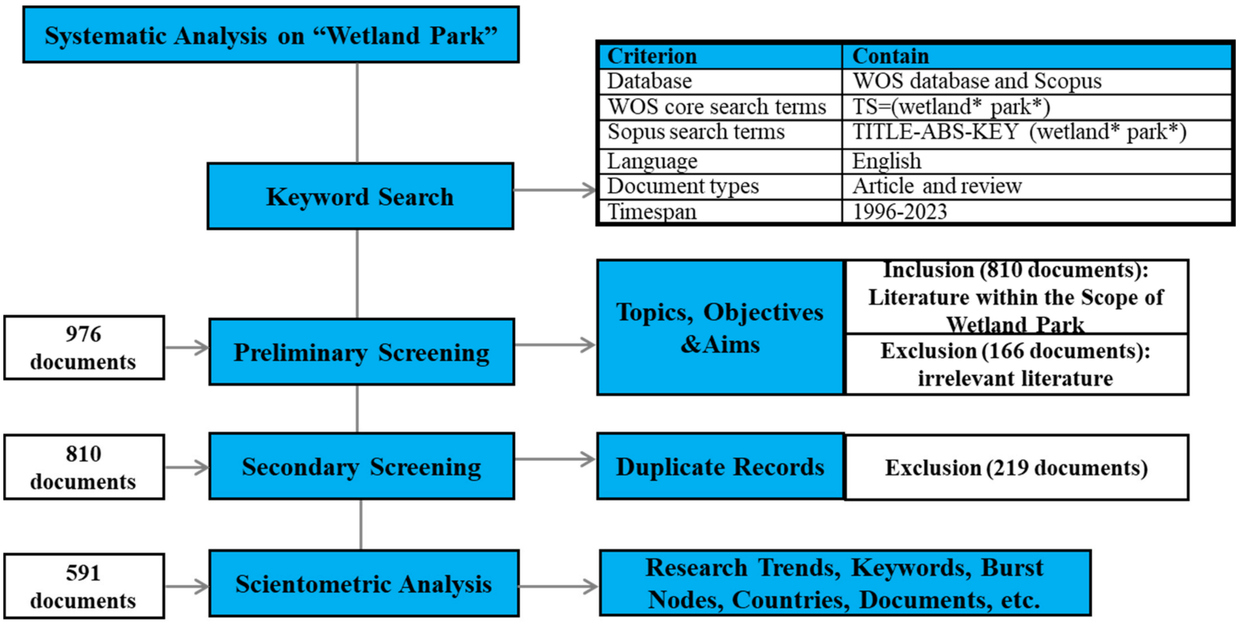

Figure 1. Flowchart of the research framework.

2.2. Data Visualization Analysis

In this study, 591 samples were visualized and analyzed using VOSViewer 1.6.17 and CiteSpace V.6.1.R6. The two tools are often used in bibliometrics to reveal popular keywords, citation bursts, clusters, countries, influential articles, and other characteristics of research data. The documents published each year were analyzed using the data input/export function in CiteSpace, with the information obtained from the analysis revealing research trends regarding wetland parks. Keywords refer to authors' defined keywords. Keywords that appear more frequently are commonly used to identify research focuses. Through an analysis of keywords using CiteSpace, the frequency of occurrence of each keyword, the centrality of nodes, and other information was obtained. In CiteSpace, the higher the centrality of a node, the greater its influence in the overall network. Nodes with a centrality of $\geq$0.1 are often referred to as critical nodes [51].

Cluster views in CiteSpace are divided into the default view and the automatic-clustering label view [52]. The automatic-clustering label view is generated by the spectral-clustering algorithm [53] based on the default view, and the clustering label is based on the TF*IDF extraction algorithm [52]. The spectral cluster itself is an algorithm derived from spectral graph theory. Therefore, it has natural advantages for co-citation network clustering based on link relationships rather than node attributes [52]. This article uses a spectral-clustering algorithm to analyze citation documents and extract tag words to represent research frontiers applied to specific knowledge bases [52,53]. High-frequency keyword citation-burst analysis conducted using CiteSpace revealed the research focuses and trends of a topic [44,54]. Burst words are keywords (nodes) that exhibit a sharp increase in occurrence during a specific period, indicating that they were popular research topics among researchers in that period. Citation bursts reflect active or emerging research areas. A cluster with many burst nodes denotes an emerging research trend [55]. Clustering also provides a visual display of the main themes of research, indicating common directions and subjects by refining and summarizing data on a research topic based on keyword network maps [56]. To perform cluster analysis, this study used a spectral-clustering algorithm. Further, this study enables knowledge mapping using the spectral-clustering algorithm Latent Semantic Index [57]:

$$\vec{q}_k = \sum\nolimits_k^{-1} \bigcup\nolimits_k^T \vec{q}$$

The values of Modularity Q ranges from 0 to 1, with values near 1 revealing close relationships and connections within the cluster [54]. Further, Modularity Q > 0.3 means the cluster structure is significant [54]. The Mean Silhouette value evaluates clustering homogeneity. While the value should be between 1 and -1 [54], the stronger the homogeneity, the closer the value is to 1 [58]. A value close to 1 indicates that the articles in the cluster are similar in content or highly consistent [54]. When the value of Silhouette (S) > 0.5, the cluster is considered reasonable, and when S > 0.7, the cluster is considered convincing [59].

CiteSpace was used to identify and evaluate countries' contributions to the available research in the global community. A country that produces many documents is active in a specific academic area. The most influential journal publications were also investigated using VOSViewer [60,61]. The most influential articles, a property that was measured using citations, were visualized using VOSViewer.

3. Results

3.1. Trends Involving Documents Published Annually

Early research on wetland parks started in 1996 (refer to Figure 2). Only nine articles were published from 1996 to 2003. Since the 1990s, research on wetland parks has mainly focused on controlling and investigating plants, animals, and lakeside ecosystems in national wetland parks in India and South Africa. Shukla and Dubey [62] proposed a mathematical model for studying the impact of environmental changes caused by an overgrowth of wild grasses on the survival of various species in the Keoladeo National Wetland Park, Bharatpur, Rajasthan, India. Further, Hart and Appleton [63] studied the lakeside ecosystem in the Greater St. Lucia Wetland Park (KwaZulu-Natal) and commented on its conservation value. Moreover, Chapman et al. [64] studied recreational reserves from the perspective of biological quantity non-lethal control in Cape Vidal Recreation Reserve in the Greater St. Lucia Wetland Park.

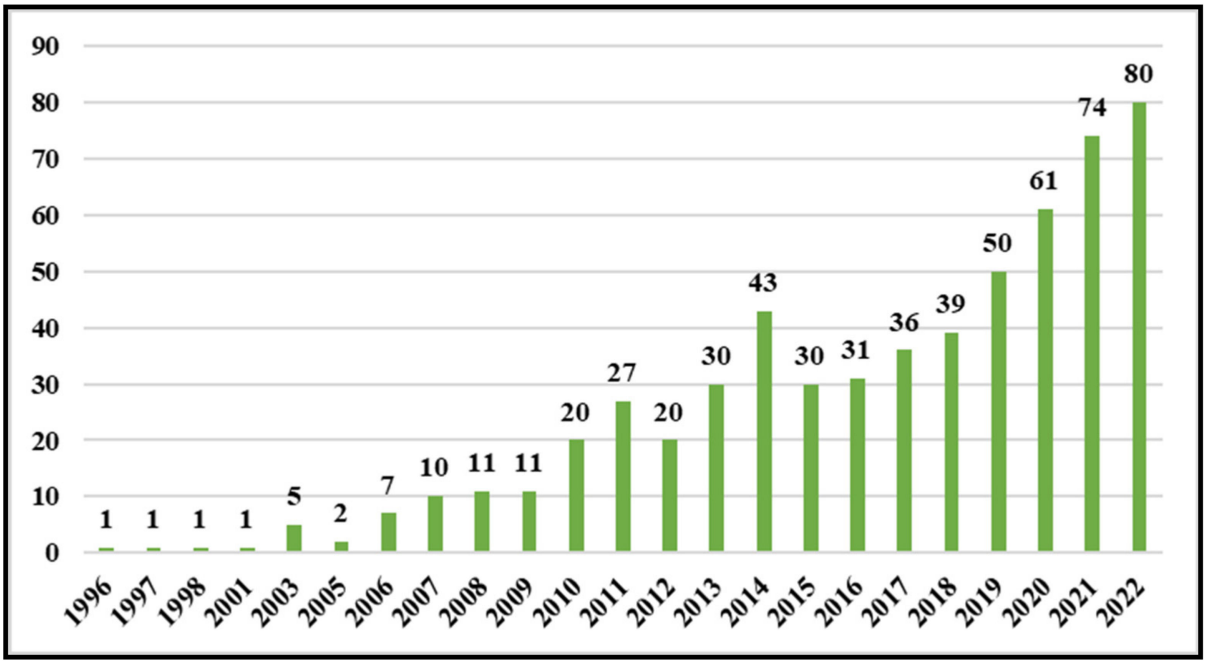

Figure 2. Annual number of articles published from 1996 to 2022 (obtained from WoS and Scopus).

Some countries started constructing wetland parks in 2005. For example, China launched the pilot construction of a national wetland park in 2005 [65]. The country published the Measures for the Administration of National Urban Wetland Parks (for Trial Implementation) on 2 February 2005 and the Guidelines for the Planning and Design of Urban Wetland Parks (for Trial Implementation) on 24 June 2005 [66]. Despite some fluctuations, from 2005 to 2014, the number of annual publications on wetland parks rose. Then, there was a stable increase in annual publications on the topic from 2015 to 2022.

3.2. Analysis of Keywords

3.2.1. Co-Occurrence Keyword Analysis

This study examined combinations of keywords such as 'wetland and wetlands', 'wetland parks and wetland park', 'animal and animals', 'ecosystem and ecosystems', et cetera. The co-occurring keywords are shown in Figure 3. Different nodes represent different keywords. The size of a node represents keyword frequency: Large nodes indicate frequently mentioned keywords, signaling primary areas of research focus. The node color gradually changes from cool to warm (blue to red) and outward from the center, indicating that the year in which the keyword appears ranges from years before to the present.

The top 18 most frequent keywords were China, South Africa, biodiversity, iSimangaliso Wetland Park, KwaZulu-Natal, ecosystems, environmental protection, water quality, ecology, Zhejiang, nonhuman, national park, urban area, Xixi National Wetland Park, animals, remote sensing, wetland management, and Aves (see Table 1).

China, South Africa, KwaZulu-Natal, and Zhejiang were popular keywords that are also the names of countries or cities. This result indicates that China, South Africa, and KwaZulu-Natal host numerous wetland parks; consequently, the areas are active and influential in research on wetland parks. Further, iSimangaliso Wetland Park and Xixi National Wetland Park were popular national wetland parks in academic research and are also renowned national parks worldwide. Moreover, national park, environmental protection, urban area, remote sensing, and nonhuman are terms associated with land use and are also related to wetland parks. Additionally, biodiversity, ecosystems, water quality, ecology, animals, and Aves are terms pertaining to wetland park characteristics and issues affecting wetland parks, encompassing ecological and circulating resources, both biotic and abiotic. In conclusion, the analysis of co-occurrence keywords indicates a predominant focus on countries with extensive wetlands, impacting land use and ecological and circulating resources.

In Figure 3, the node's purple outer circle indicates that the node's centrality value (C) is >0.1. The larger the purple outer circle, the greater the node's centrality. When purple is not noticeable or is absent, the associated keyword is not popular. As shown in Table 2, 10 keywords occur with high frequency and have high centrality values. The results indicate that China (C = 0.25), nonhuman (C = 0.21), animals (C = 0.2), constructed wetland (C = 0.18), ecosystems (C = 0.17), aminophospholipid (C = 0.14), biodiversity (C = 0.13), community structure (C = 0.13), human activity (C = 0.13), and ecology (C = 0.11) are influential keywords in wetland park research. China (frequency = 236; C = 0.25) emerges as the most influential research country, being the most frequently occurring term as well as possessing a high centrality value. As Section 2.2 mentioned, the centrality of a node is used to describe how important a node is to the overall network. The higher its value, the more important that node is.

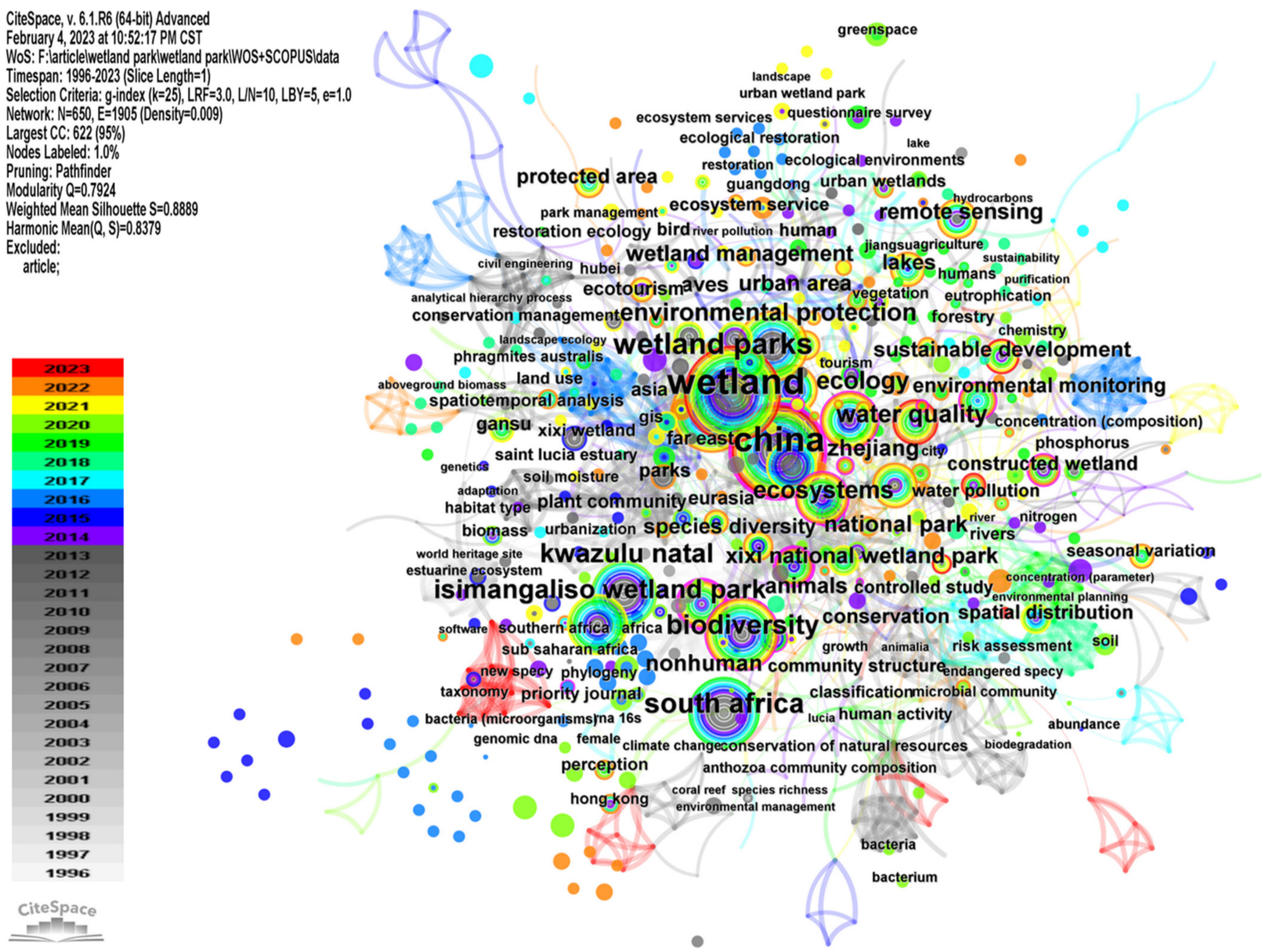

Figure 3. Network of keywords that co-occur in research on wetland parks.

Table 1. Top 18 keywords on WoS and Scopus occurring most frequently in research on wetland parks.

Number	Keyword	Frequency	Centrality	Year Research Indexed in Web of Science/ Scopus on Wetland Parks Was First Published
1	China	231	0.25	2003
2	South Africa	75	0.03	2001
3	Biodiversity	64	0.13	2005
4	iSimangaliso Wetland Park	55	0.02	2010
5	KwaZulu-Natal	52	0.07	2005
6	Ecosystems	43	0.17	2003
7	Environmental protection	41	0.07	2003
8	Water quality	41	0.03	2011
9	Ecology	39	0.11	2003
10	Zhejiang	33	0.06	2006
11	Nonhuman	32	0.21	2010
12	National park	30	0.04	2009
13	Urban area	27	0.04	2011
14	Xixi National Wetland Park	26	0.01	2008
15	Animals	25	0.2	2003
16	Remote sensing	25	0.06	2008
17	Wetland management	25	0.06	2006
18	Aves	24	0.07	2003

Notes: 'wetland' and 'wetland park' were removed because we used these keywords to search in Web of Science and Scopus.

Table 2. Top 10 keywords with high centrality in research available on wetland parks in WoS and Scopus.

Number	Keywords	Centrality	Frequency	Year of the First Wetland Park Publication Indexed in Web of Science/Scopus
1	China	0.25	231	2003
2	Nonhuman	0.21	32	2010
3	Animals	0.20	25	2003
4	Constructed wetland	0.18	18	2007
5	Ecosystems	0.17	43	2003
6	Aminophospholipid	0.14	4	2013
7	Biodiversity	0.13	64	2005
8	Community structure	0.13	14	2005
9	Human activity	0.13	10	1996
10	Ecology	0.11	39	2009

3.2.2. Keywords Appearing in Citation Bursts: An Insight into Wetland Park Research Evolution

Since 1996, research trends on wetland parks have evolved over five transformative periods (Figure 4). These changes not only reflect the scientific understanding of wetland parks but also reveal the new challenges posed by global environmental changes to wetland protection and management. In Figure 4, the red line represents the specific diachronic stage when the keyword became a hot topic in academic research, the light blue line shows that the node has not yet appeared, and the dark blue line shows that the node has begun to appear. Furthermore, strength value indicates emergent strength. The higher the value, the more the burst node has been studied.

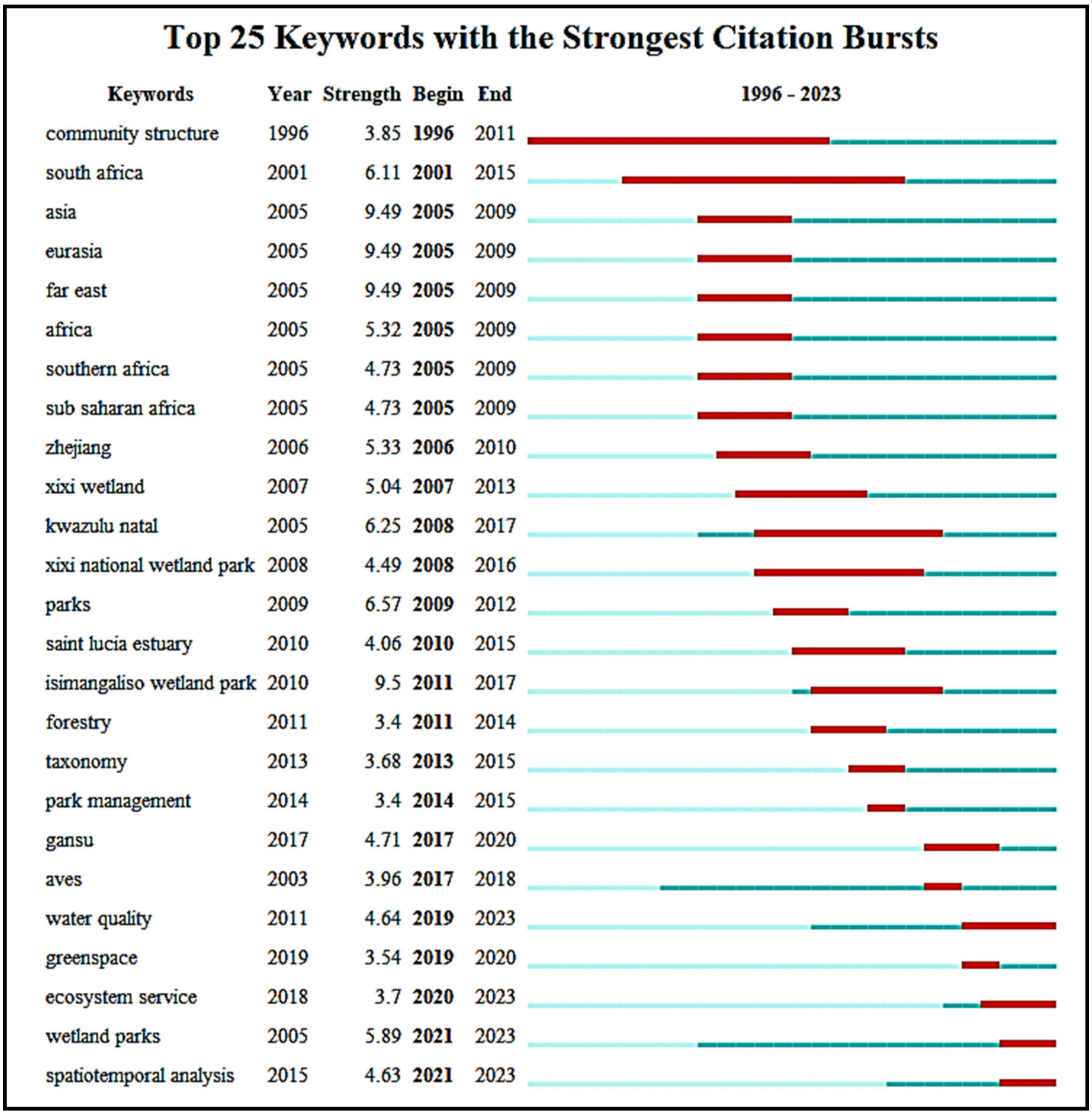

Figure 4. Top 25 Keywords with the strongest citation bursts in studies on wetland parks. Note: 'Year' refers to the keyword burst year, while 'Begin' and 'End' refer to the year a citation burst started or ended. The red line represents the specific diachronic stage when the keyword became a hot topic in academic research; the light blue line shows that the node has not yet appeared, and the dark blue line shows that the node has begun to appear.

(1) Wetland park research began in 1996: Research during this period emphasized ecological community composition and species interactions. However, there was a lack of in-depth quantitative inquiry into ecological processes and the dynamics of community structure, and researchers largely failed to consider global climate change and increasing human activities that affect wetland park. The citation-burst keyword 'community structure' (strength value = 3.85), which is terminology utilized by ecologists, has been used since 1996. Community structure refers to the species composition, i.e., occurrence and abundance in biogeochemical interactions' networks [67]. Hart and Appleton [63] studied community structure in the lakeside ecosystem in Lucia Wetland Park (KwaZulu-Natal) and commented on its conservation value. Community structure is the earliest burst among the top 25 burst nodes, and its strength value of 3.85 is lower than that of others. This outcome indicates that community structures

are relatively less popular than some burst nodes but became hotspots from 1996 to 2011.

(2) Geographical and regional identities since 2001: The research focus shifted to countries, cities, and regions with famous wetland resources or parks, namely, South Africa (strength value = 6.11), Asia (strength value = 9.49), Eurasia (strength value = 9.49), the Far East (strength value = 9.49), Africa (strength value = 5.32), Southern Africa (strength value = 4.73), Sub-Saharan Africa (strength value = 4.73), and Zhejiang (strength value = 5.33). All the above are names of countries, cities, or regions. This condition reflects researchers' focus on the ecological characteristics and regional conservation needs in specific geographic areas, especially in Asia (strength value = 9.49), Eurasia (strength value = 9.49), and the Far East (strength value = 9.49). These three nodes have the second-highest strength value of 9.49 among the burst nodes shown in Figure 4. Further, South Africa (strength value = 6.11), Zhejiang (strength value = 5.33), and Africa (strength value = 5.32) have strength values of more than 5. This outcome means Asia, Eurasia, the Far East, Africa, South Africa, and Zhejiang are famous in wetland park research. However, the results also indicate a lack of systematic research at the global scale, ignoring potential mutual influences between different regions and learning opportunities, which is vital for wetland park managers and governors.

(3) Scenic wetland parks emerged in research in 2007: The study further narrowed the focus to specific national and regional wetland parks, particularly those in South Africa and China. Xixi Wetland (strength value = 5.04), KwaZulu-Natal (strength value = 6.25), Xixi National Wetland Park (strength value = 4.49), Saint Lucia Estuary (strength value = 4.06), and iSimangaliso Wetland Park (strength value = 9.5), which are famous national wetland parks in China and South Africa, began to appear in that year. Among all the top 25 burst nodes, iSimangaliso Wetland Park (strength value = 9.5) has the highest strength value. This finding indicates that iSimangaliso Wetland Park is the most popular burst node in wetland park research. Notably, KwaZulu-Natal located in South Africa and Xixi Wetland located in China have a moderately higher strength value than 5.

(4) This narrowing down shows that researchers explored the role of wetland parks in ecotourism, education, and the regional economy. Although this research stage emphasized the contribution of wetland parks to social economy and ecological education, it ignored the potential damage to the original functions of the ecosystem caused by excessive commercialization, including an assessment of the impact of ecotourism on the wetland ecosystem. Research also shifts to detailed ecological environments, specific plant communities (such as forests), and the complexity and dynamics of wetland ecosystems. However, these studies need to be integrated with environmental management and policy formulation, such as focusing on the quantitative assessment of wetland ecosystem services, innovation in ecological restoration technologies, and the role of plants in wetland ecosystems.

(5) Integration of biodiversity and wetland park management since 2013: From 2013, plant and animal biodiversity became the major research focus. Wetland park management (strength value = 3.40) research also gained popularity. Additionally, Gansu (strength value = 4.71), a city in China, emerged as an area of interest, as indicated by a burst node. This research phase reflects increased global concern for biodiversity conservation and sustainable management. This phase began to integrate various previous studies, emphasizing the importance of biodiversity to wetland ecosystems and human well-being. This phase also highlights the key role of wetland management in coping with climate change and protecting biodiversity. Notably, the strength value of park management, at 3.40, was lowest among the top 25 burst nodes. There is still a lack of effective integration of biodiversity conservation and wetland park management strategies in research, including the maintenance of ecosystem services,

the utilization of restoration ecology, and models of community participation and stakeholder collaboration.

(6) A comprehensive study of water quality, green spaces, and ecosystem services (since 2019): The latest research trends focus on the environment and land, covering water quality (strength value = 4.64), green spaces (strength value = 3.54), and ecosystem services (strength value = 3.70) as well as the use of spatiotemporal analysis (strength value = 4.63). Although the burst nodes in this period have a strength value lower than 5, it is apparent that wetland park research is moving in a comprehensive, quantitative, and refined direction. The importance of wetland ecosystem service assessment and the potential application of new technologies (such as remote sensing, GIS, etc.) are being seen. Future research needs to pay attention to the application of data analysis techniques and the accuracy of interpretation. Furthermore, over the past three years, the terms water quality, ecosystem services, wetland parks, and spatiotemporal analysis have increasingly appeared in bursts, indicating a trend that may continue (see Figure 4). All in all, research on wetland parks has evolved from focusing on the exploration of basic community structures into complex ecosystem service assessments and management strategy formulation.

3.3. Cluster Analysis Results

In the analysis, 46 clusters were identified. The top 10 significant clusters are displayed in Figures 5 and 6 based on different classification approaches. The clusters are ordered from #0 to #9, where a low number indicates that many keywords were included in the cluster. The results reveal that Modularity Q = 0.7924 (>0.7) and Mean Silhouette (S) = 0.8919 (>0.7). A Modularity Q result exceeding 0.3 indicates that the cluster structure is significant and clustering homogeneity is relatively strong [58] (refer to Figures 5 and 6, Tables 3 and 4). The top five cluster labels under each cluster were selected. This study shows that the top 10 clusters are: '#0 South Africa', '#1 Phragmites Australis', '#2 Zhejiang', '#3 ecosystem', '#4 environmental monitoring', '#5 China', '#6 denitrification', '#7 male', '#8 bird', and '#9 rivers' (see Figure 5).

In Table 3, '#0 South Africa', '#2 Zhejiang', and '#5 China' are categorized as countries or regions with wetland parks. The table indicates that the research methods used were mainly on-site surveys, experiments, or spatial research. For example, keyword analysis indicates that remote sensing was a primary area of research focus (refer to Table 1 and Figure 3). The clusters '#3 ecosystem' and '#4 environmental monitoring' refer to research on environmental protection and its benefits for ecosystem sustainability in wetland parks. Furthermore, the cluster '#6 carbon sequestration' appears among the top terminology utilized by researchers, indicating that carbon circulation was an area of substantial scholarly interest, with 'wetland' referring to both 'green carbon' and 'blue carbon'. Moreover, the clusters '#1 Phragmites Australis', '#6 denitrification', '#7 male', and '#8 bird' refer to research areas relating to wetland park biodiversity. The cluster '#9 rivers' relates to research on water resources in wetland parks. Thus, the main research directions include famous national wetland parks, ecosystem monitoring, biodiversity, carbon resource circularity, and water resources.

In the abstracts of analyzed studies, the top 10 identified clusters include '#0 other species', '#1 leaf thickness', '#2 urban ecological security', '#3 lake level', '#4 organochlorine pesticide', '#5 novel species', '#6 recycled aggregate', '#7 landscape naturalness', '#8 bird dropping', and '#9 microplastic pollution' (see Figure 6 and Table 4). Further, the clusters '#0 other species', '#1 leaf thickness', '#5 novel species', and '#8 bird dropping' indicate that numerous studies focused on biodiversity, particularly in plants and animals. The clusters '#2 urban ecological security' and '#3 lake level' indicate that studies also focused on ecological safety and water levels. The clusters '#4 organochlorine pesticide' and '#9 microplastic pollution' indicate that pollution in wetland parks' was a popular topic. The clusters '#6 recycled aggregate' and '#7 landscape naturalness' indicate that a number of studies focused on nature-based solutions in the construction of wetland parks. Thus, the primary research directions were biodiversity, ecological safety, water level, nature-based solutions, and pollution problems. The results were consistent with the cluster analysis results outlined above.

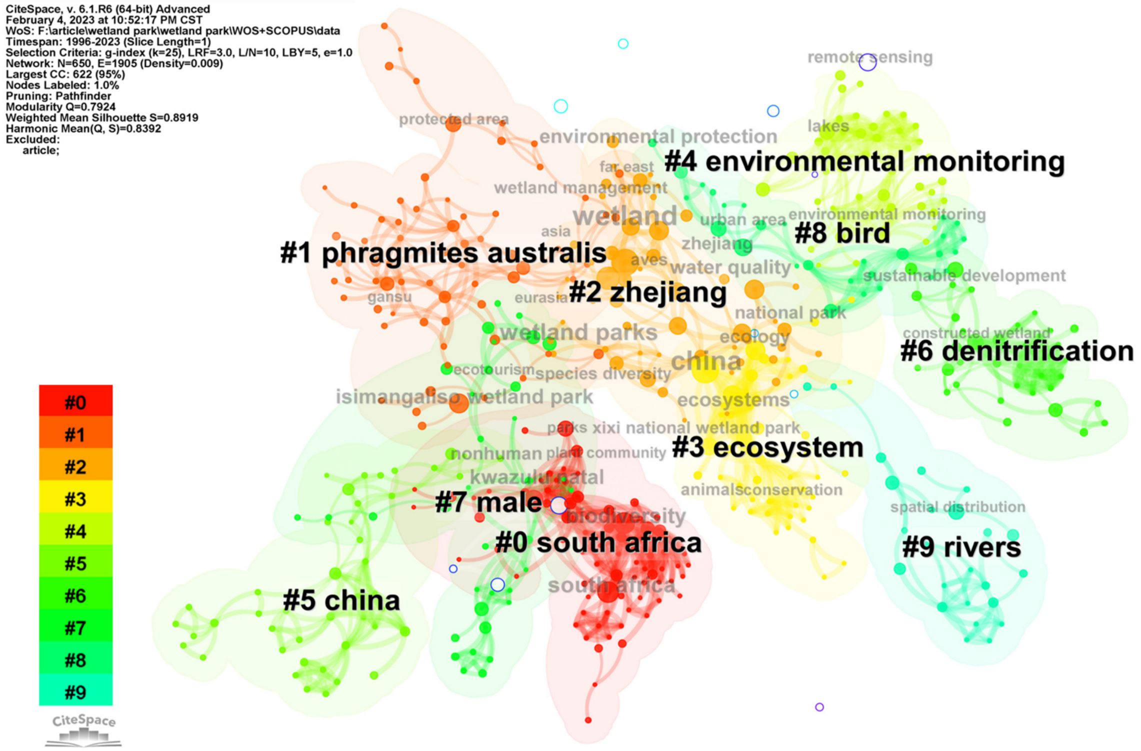

Figure 5. Spectral cluster results based on indexing terms.

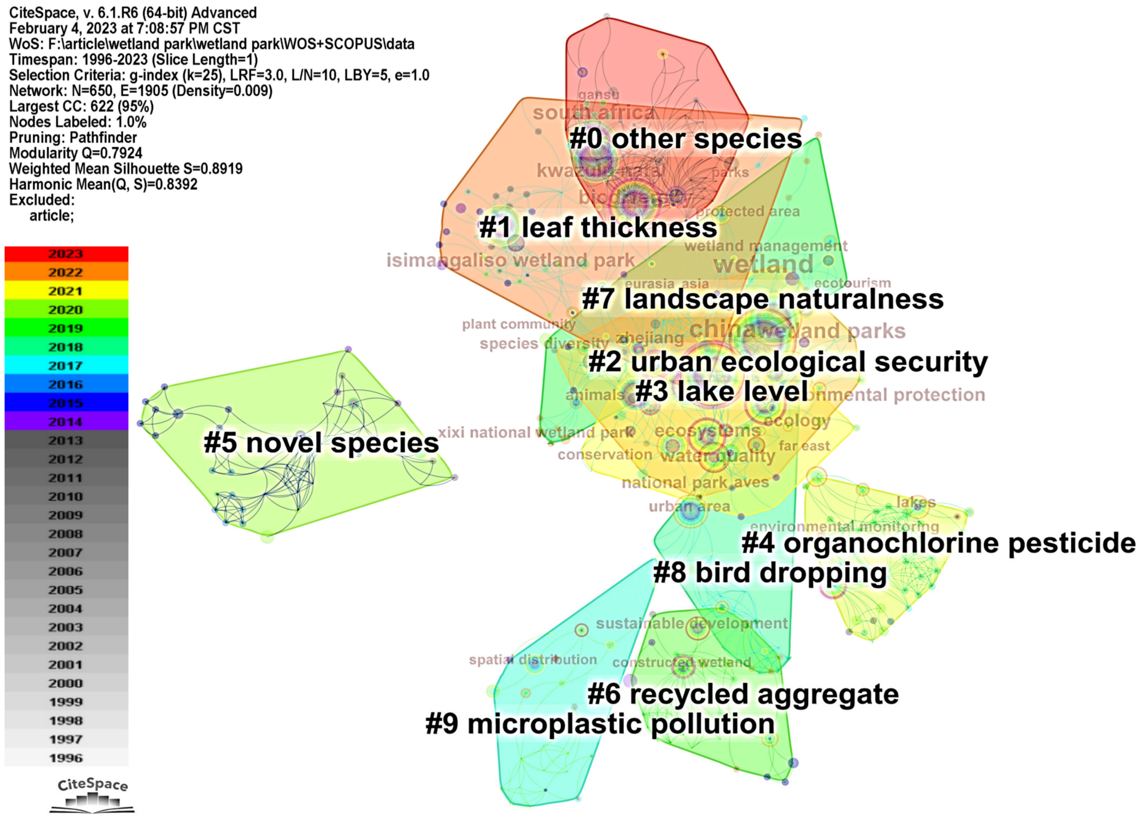

Figure 6. Cluster analysis based on abstract terms.

Table 3. Top 10 largest clusters based on indexing terms.

Cluster	Size	Silhouette	Average Year of Cluster Occurrence	Top Terms (Log-Likelihood Ratio)
#0 South Africa	77	0.906	2006	South Africa; KwaZulu Natal; world heritage site; Sub-Saharan Africa; Southern Africa
#1 *Phragmites australis*	68	0.771	2015	*Phragmites australis*; Gansu; Mesopodopsis africana; Saint Lucia Estuary; adaptation
#2 Zhejiang	55	0.818	2010	Zhejiang; Xixi National Wetland Park; Far East; Hangzhou; China
#3 ecosystem	48	0.938	2004	ecosystem; China; animal; animals; ecosystems
#4 environmental monitoring	45	0.899	2016	environmental monitoring; ozone; season; seasons; pesticide residue
#5 China	44	0.897	2013	China; Potamonautes; Taiwan; phylogeny; phenotype
#6 denitrification	37	0.915	2013	denitrification; carbon sequestration; biochemical oxygen demand; constructed wetland; eutrophication
#7 male	36	0.886	2014	male; female; perception; Odonata; noise
#8 bird	28	0.963	2008	bird; selenium; United States; Aves; water management
#9 rivers	24	0.879	2014	rivers; spatial distribution; Yellow River Basin; South Africa; river

Table 4. Top 10 largest clusters based on abstract terms.

Cluster	Size	Silhouette	Average Year of Cluster Occurrence	Top Terms (Log-Likelihood Ratio; *p*-Level)
#0 other species	77	0.906	2006	other species; South Africa; wild grasses; south lake; coral reef
#1 leaf thickness	68	0.771	2015	leaf thickness; leaf trait; soil salinity; transpiration rate; net photosynthetic rate
#2 urban ecological security	55	0.818	2010	urban ecological security; wetland park; species composition; Xixi wetland; interspecific competition
#3 lake level	48	0.938	2004	lake level; ecological aesthetics; alien invasive plant; spontaneous plant species; spontaneous vegetation
#4 organochlorine pesticide	45	0.899	2016	organochlorine pesticide; Southern Africa; water health; seasonal succession; common fish species
#5 novel species	44	0.897	2013	novel species; phylogenetic analyses; freshwater crab; gene sequence; type strain
#6 recycled aggregate	37	0.915	2013	recycled aggregate; wetland park; construction effect; Tangxi River; tile aggregate
#7 landscape naturalness	36	0.886	2014	landscape naturalness; noise annoyance; wise use; general visitor; common crane
#8 bird dropping	28	0.963	2008	bird dropping; public building; recreational corridor; Xixi Wetland Park; wetland park
#9 microplastic pollution	24	0.879	2014	microplastic pollution; Yellow River Basin; river wetland landscape planning; dominant group; surface water

In summary, the leading research directions and subjects included the famous national wetland parks of some countries, biodiversity, environmental monitoring in ecosystems, ecological safety, circulation of carbon resources, water resources, water levels, and nature-based solutions in urban wetland parks.

3.4. Economic Development of Countries/Regions and Wetland Park Research

In VOSViewer, the unit of analysis was set as countries, while the type of analysis was bibliographic. The minimum number of documents for a country was two, and the minimum number of citations for a country was zero. Out of 47 countries, 29 met the thresholds. Furthermore, for each of the 29 countries, the total strength of the citation links with other countries was calculated. Subsequently, countries with the greatest total link strength were selected. As shown in Figure 7, China (n = 340) and South Africa (n = 95) produced the highest volume of wetland park research among countries, and both are developing countries. Apart from China and South Africa, the third most productive developing country was India, which ranked 10. Most of the top 15 most highly productive countries in terms of wetland park research were developed countries: the United States, the United Kingdom, Australia, Italy, Sweden, Germany, Canada, Norway, Portugal, South Korea, Greece, and Spain.

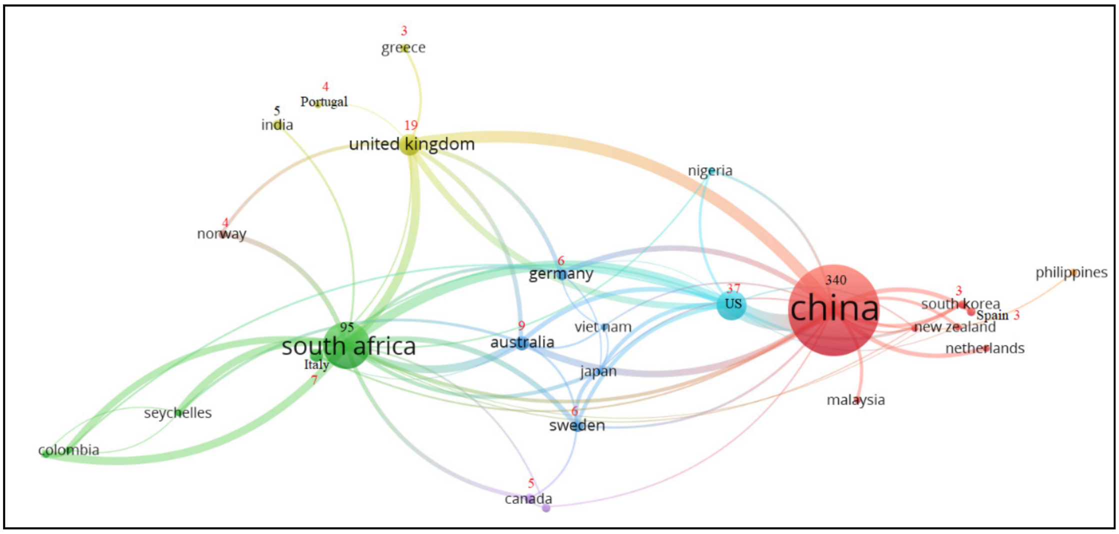

Figure 7. Active countries/regions with wetland park original research articles in WoS and Scopus. Note: the number next to the countries indicates the number of documents published by authors in that country; countries with 1 or 2 documents have no number beside their names; a number in red indicates that a country is developed, while a black number signifies a developing country.

Malaysia, with an average publication year of 2022, is the latest entrant to join the ranks of countries actively researching the field of wetland parks (Table 5). In contrast, Canada has the longest history of research in this field, with an average publication year of 2013 (Table 6). As shown in Table 5, the top 15 latest countries/regions to become active in wetland park research are Malaysia, Germany, Spain, Nigeria, Sri Lanka, Vietnam, Netherlands, Seychelles, Colombia, Greece, Portugal, Australia, China, New Zealand, and the Philippines. Most of these countries are developed countries/regions. As shown in Table 6, the top 15 earliest countries/regions to conduct wetlands research include Canada, India, South Africa, Sweden, Italy, Norway, the United States, France, Japan, South Korea, the United Kingdom, Finland, New Zealand, Philippines, and China. In short, developed countries started conducting wetland park research before their developing counterparts.

China is the most active country among all developing countries regarding research on wetland parks. South Africa and India are not only the most active countries but were also the first three countries to have begun researching wetland parks. Malaysia, Nigeria, Sri Lanka, and Vietnam, which are developing countries, started researching this field late. Many developed countries are among the top 15 active countries/regions and the top 10 earliest countries to engage in active research in this field. In contrast, more developing countries are in the category comprising the top 10 latest countries/regions. Notably, although Germany started researching later than Canada, Norway, Portugal, Greece, South

Korea, Spain, et cetera, it is more active than other developed countries/regions in wetland park research.

Developed countries are more research-productive than developing countries, except for China, South Africa, and India, which have large wetland areas and active research efforts on wetland parks.

Table 5. Top 15 Latest Countries/Regions to Engage in Wetland Parks Research.

Country/Region	Economic Development	Average Publication Year
Malaysia	Developing	2022
Germany	Developed	2021
Spain	Developed	2021
Nigeria	Developing	2021
Sri Lanka	Developing	2021
Vietnam	Developing	2021
Netherlands	Developed	2020
Seychelles	Developing	2020
Colombia	Developing	2020
Greece	Developed	2019

Table 6. Top 15 Earliest Countries/Regions to Engage in Wetland Park Research.

Country/Region	Economic Development	Average Publication Year
Canada	Developed	2013
India	Developing	2013
South Africa	Developing	2014
Sweden	Developed	2014
Italy	Developed	2015
Norway	Developed	2016
The United States	Developed	2016
France	Developed	2016
Japan	Developed	2018
South Korea	Developed	2018

3.5. Analysis of Article Influence

The top 10 influential articles with over 70 citations are shown in Table 7. The most influential article is 'Estimating standing biomass in papyrus (*Cyperus papyrus* L.) swamp: exploratory of in situ hyperspectral indices and random forest regression' [68]. The second-most influential article is by Poon and Chan [69]: 'The use of recycled aggregate in concrete about construction of wetland parks in Hong Kong'. Among the top 10 influential articles, papers by Adam, Mutanga, Abdel-Rahman and Ismail [68], Adam and Mutanga [70], and Li et al. [71] mainly focus on plants in wetland parks. Further, Poon and Chan [69] researched construction materials used in wetland parks. Additionally, Meng et al. [72] and Zheng et al. [73] researched China's wetlands. Moreover, Whyte et al. [74] studied wetland parks using artificial intelligence. Furthermore, Buah-Kwofie et al. [75] and Leslie and Spotila [76] studied animals in South Africa. Finally, Lai and Lam [77] delved into the intricate dynamics of phosphorus sorption by sediments in a subtropical wetland that serves as a recipient for stormwater runoff.

The most highly cited wetland park articles mainly focus on five aspects: plant resources, animal resources, China, water resources, and South Africa. Further, the research field covers different areas such as environmental science, ecological economy, forestry, wetlands, tourism, and management, showing the comprehensive nature of research on wetland parks.

Table 7. Most-Cited Wetland Park Articles.

Authors	Title	Sources	Citations	Main Content
Adam et al. [68]	Estimating standing biomass in papyrus (*Cyperus papyrus* L.) swamp: exploratory of in situ hyperspectral indices and random forest regression	International Journal of Remote Sensing	218	This study aimed to test the use of random forest (RF) regression and two narrowband vegetation indices in estimating aboveground biomass (AGB) in a complex and densely vegetated marsh canopy. Normalized vegetation index (NDVI) and enhanced vegetation index (EVI) were calculated from field spectral measurement data and fresh AGB measured in 82 quadrants in 3 different areas of iSimangaliso Wetland Park, South Africa.
Poon and Chan [69]	The use of recycled aggregate in concrete in Hong Kong	Resources Conservation and Recycling	212	In Hong Kong, it is crucial to find ways to reuse construction and demolition waste to alleviate the need for a public landfill. The study summarizes the construction details of the Hong Kong Wetland Park, which consumed approximately 14,300 m^3 of recycled aggregate concrete. The authors explored the possibility of using broken brick aggregate from a construction and demolition waste stream to replace fine aggregate in concrete. The effects on the freshness and mechanical properties of using finely crushed brick and tile aggregate to replace 20 wt.% natural sand are also presented.
Adam and Mutanga [70]	Spectral discrimination of papyrus vegetation (*Cyperus papyrus* L.) in swamp wetlands using field spectrometry	Isprs Journal of Photogrammetry and Remote Sensing	134	Wetland species mapping and monitoring techniques are critical to sustain these species. The researchers collected canopy spectral measurements of papyrus and three other species on-site at the Greater St. Lucia Wetland Park in South Africa. A new hierarchical approach based on three integrated levels of analysis was proposed and implemented to distinguish papyrus from other species spectrally and to reduce and subsequently select the best bands for potential differentiation of papyrus. The three-step hierarchical approach employed in this study can systematically reduce the dimensionality of frequency bands to a manageable level, which is a step toward the operational utilization of band-specific sensors.
Meng, He, Hu, Mo, Li, Liu and Wang [72]	Status of wetlands in China: A review of extent, degradation, issues and recommendations for improvement	Ocean & Coastal Management	114	Status of wetlands in China: A review of extent, degradation, challenges and recommendations for improvement. The total wetland area in China is 53.42×10^6 ha, accounting for 10% of the world's wetlands and 5.58% of China's land area. China's wetlands have constantly been seriously threatened by multiple factors. This article reviews the status of wetland resources and discusses the factors influencing wetland degradation and the weaknesses of the current management system. Some suggestions for improving wetland protection and management in China are: (1) Improve the laws and regulations related to wetlands, (2) Establish specialized management agencies, (3) Strengthen wetland research and monitoring, and (4) Enhance public wetland protection consciousness.
Whyte, Ferentinos and Petropoulos [74]	A new synergistic approach for monitoring wetlands using Sentinels-1 and 2 data with object-based machine learning algorithms	Environmental Modelling & Software	109	Sentinel-1 and 2 were evaluated using the System for Automated Geoscience Analysis (SAGA) moisture index in the context of land use/land cover (LULC) mapping (focusing on wetlands) using the iSimangaliso Wetland Park as a study site. A new object-based image analysis method combined with machine-learning algorithms for mapping wetland areas was developed using Sentinel-1 and 2 data. The SAGA Moisture Index performed well in differentiating wetland environments and, when synergised with Sentinel-1 and 2, allowed successful LULC classification in locations where both wetland and non-wetland categories exist.

Table 7. *Cont.*

Authors	Title	Sources	Citations	Main Content
Lai and Lam [77]	Phosphorus sorption by sediments in a subtropical constructed wetland receiving stormwater runoff	Ecological Engineering	98	This study investigated the potential of using a mixture of fishpond bund material, fully weathered granite, and river sand as a matrix for phosphorus removal in constructed wetlands. Core samples were collected from the newly constructed Hong Kong Wetland Park (HKWP), which receives stormwater inflow from a nearby new town. Furthermore, batch incubation experiments were conducted to determine the phosphorus adsorption properties of the sediments. Although the matrix in HKWP shows great P adsorption potential, the P load in the influent should also be considered to fully utilize the P adsorption capacity of sediments and improve the P removal efficiency of constructed wetlands.
Zheng, Zhang, Niu and Gong [73]	Protection efficacy of national wetland reserves in China	Chinese Science Bulletin	91	China has not yet evaluated the effectiveness of wetland's function in protecting the nature and the rationality of its layout at the national level. This study used the newly completed China wetland nature reserves protection value evaluation database and 4 issues (from 1978) extracted according to the same classification system (from 2008), China's wetland remote sensing mapping data, supplemented by relevant protected area, and environmental and other data to conduct a preliminary assessment of 91 Chinese national wetland nature reserves' conservation effectiveness in the past 30 years. The research results list the 'priority attention ranking list' of China's national wetland nature reserves.
Leslie and Spotila [76]	Alien plant threatens Nile crocodile (*Crocodylus niloticus*) breeding in Lake St. Lucia, South Africa	Biological Conservation	77	Most Nile crocodiles (*Crocodylus niloticus*) that nest in Lake St. Lucia choose open, sunny, sandy areas to lay their eggs. The nest is mainly shaded by the exotic plant *Chromolaena odorata*. When the researchers experimentally created additional nesting sites, the percentage of exploited sites increased, suggesting that they fell short of suitable nesting sites. This exotic plant poses a very serious threat to the continued survival of the Nile crocodile in the Greater St. Lucia Wetland Park, and unless immediate action is taken, the female-biased sex ratio will lead to the eventual extinction of the species from this recently reclaimed area.
Li, Chau and Tang [71]	Can surrounding greenery reduce noise annoyance at home?	Science of The Total Environment	72	Residential community features such as greenery have been shown to reduce noise annoyance. This project investigated the impact of potential annoyance modifiers by conducting face-to-face interviews using questionnaires combined with sufficient residential information to predict household noise levels accurately. An ordered logit model was used for analysis. Wetlands and garden parks have been proven to reduce noise annoyance to a greater extent than the reduction due to grassy hills.
Buah-Kwofie, Humphries and Pillay [75]	Bioaccumulation and risk assessment of organochlorine pesticides in fish from a global biodiversity hotspot: iSimangaliso Wetland Park, South Africa	Science of The Total Environment	71	The continued use of organochlorine pesticides (OCPs) may pose risks to some sensitive and protected species. This study aimed to detect the bioaccumulation of OCPs in two common fish species, *Oreochromis mossambicus* (Mozambique tilapia) and *Clarias gariepinus* (African sharp-tooth catfish), in iSimangaliso Wetland Park. This study is the first investigation of OCP bioaccumulation in fish at iSimangaliso Wetland Park. Our findings highlight the need for a detailed investigation of the bioaccumulation and ecotoxicological effects of these contaminants in food webs and the associated risks to local ecosystems and human health.

4. Discussion

As previously mentioned, the results of searching co-occurring keywords, citation bursts, clusters, and active countries, alongside conducting influential article analysis, revealed five transformative periods in the evolution of wetland park research. The research foci were biodiversity, some abiotic resources (i.e., water, soil, CO_2, etc.), land use, and national wetland parks in China and South Africa. Further, based on cluster analysis, nature-based solutions in wetland parks were identified as the main future research direction. Consequently, the discussion analysis is based on these aspects.

4.1. Biodiversity and Abiotic Resources Are Research Focus Areas

The results indicate that biodiversity, water and soil resources, CO_2, et cetera are research focus areas.

4.1.1. Biodiversity and Wetland Parks

The results of co-occurring keywords and citation bursts show that 'biodiversity' was the focus of research on wetland parks. One of the reasons for this outcome is that wetland parks belong to a specific ecosystem. Assessing the biodiversity of a particular ecosystem is the first step in evaluating its conservation value [78]. Many scholars have investigated the biodiversity of wetland parks. From prevention and control of harmful species and risks [18] to the research and design of biodiversity in ecological networks [35], research has begun to shift from conservation, control, and restoration to the current management and utilization of wetland parks and the transformation of their biodiversity. For example, concerning South Africa's iSimangaliso Wetland Park, Lin, Chen and Luo [32] assessed bioaccumulation and the risk posed by organochlorine pesticides in fish from a global biodiversity perspective. Their research identified the relationship between species and environmental factors [31].

Research on biodiversity in wetland parks mainly includes the protection and utilization of dominant species of animals [36], plants [34], and microorganisms [33]. On the other hand, natural sciences, such as biology, physics, and chemistry, have inherent distinct research traits, experimental methods, and developmental advantages. This situation may explain why biodiversity—encompassing animals, plants, microorganisms, et cetera—has emerged as a focal point in wetland park research. Additionally, wetland park research mainly focuses on the investigation, evaluation, protection, and monitoring of individual or multiple elements of biodiversity, such as animals, plants, and microorganisms, as well as abiotic elements such as water, soil, and carbon dioxide. Thus, wetland parks are a type of comprehensive and complex ecosystem. Consequently, there is a need to foster collaboration among individuals from diverse disciplinary backgrounds to achieve the sustainable development of biodiversity in wetland parks. These individuals may include ecologists, environmental scientists, hydrologists, planners, landscape designers, wildlife-management experts, botanists, soil scientists, ecological and environmental managers, socio-economists, policymakers, and lawyers.

4.1.2. Abiotic Resources and Wetland Parks

Wetland parks are a kind of ecosystem containing biology, abiotic resources, et cetera. Abiotic resources, such as water, soil, carbon dioxide, et cetera have a strong relationship with wetland parks. The research on water resources in wetland parks is mainly focused on the quality [79], environment [80], and levels [81] of water. For example, Liu and Lu [38] studied the ecological engineering methods of restoring aquatic biological communities in the urban pond ecosystem and their impact on water quality in China's Xixi National Wetland Park. Scholars have also focused on the relationship between wetland park biology and soil, exploring the effects of soil pollution, et cetera. For example, Lin et al. [82] studied cellulose-degrading bacteria, while Zhao et al. [83] studied plant diversity and soil properties during different wetland restoration stages.

Vegetation, soil, and hydrology are the most universally recognized and important features of wetland ecosystems [20]. Thus, research on water, soil, land resources, and CO_2 shall remain popular in the wetland parks literature in the future. Moreover, cluster analysis shows that carbon sequestration was one area of research focus, reflecting the role of wetlands in carbon resource circularity. Due to the popularity of the concept of carbon dioxide neutrality, scholars have increasingly researched the ability of wetland parks to absorb CO_2. These wetland parks include mangroves, salt marshes, seagrass beds, and forests [84]. The vegetation in a wetland park can absorb CO_2 from the atmosphere through photosynthesis and convert it into carbohydrates to meet plant growth needs. Most hard-to-decompose carbon is stored in wetland soil as lignin and cellulose [84]. Moreover, Wang et al. [85] found that the proportion of wetland area in a region is one of the main factors determining the achievement of low-carbon competitiveness. Furthermore, researchers have acknowledged that wetland parks contribute significantly to the enhancement of water and soil environments as well as to the reduction of carbon emissions.

The protection, renewal, utilization, and construction processes of wetland parks often partially rely on construction materials and consumables. These materials invariably emit CO_2 during their production and transportation phases. Notably, carbon-sink research in wetland parks is virtually non-existent, impeding the sustainable maintenance of these ecosystems. Therefore, it is imperative for future research to adopt a holistic approach, considering the dynamic relationship between carbon emissions and sequestration within wetland parks; that is, to adopt a full life cycle perspective [86]. This approach would necessitate moving beyond the singular focus on the carbon absorption capabilities of wetland parks to include a broad examination of their overall carbon footprint.

4.2. Land Use: An Area of Research Focus

The result of the co-occurrence keywords shows that land use is one of the most popular research topics in wetland parks. This result may primarily be attributed to the damage caused by irrational land use practices on a wetland ecosystem. Critical research gaps persist despite the accumulation of evidence underscoring the adverse effects of agricultural expansion, urbanization, and other land use transformations on wetland ecosystems.

Sun et al. [87] and Li et al. [88] studied the effects of land use transformation on heavy metal pollution in surface soil in wetland parks. Moreover, Duy et al. [89] highlighted the need to clearly understand the growing flood vulnerability associated with urban sprawl on low-lying former wetlands and indicated that environmental legal liability may excessively rely on punitive measures [90] while ignoring the rational use of land, environmental prevention, and the application of compensation mechanisms.

In the past, to pursue rapid economic growth, some countries sacrificed the ecological environment to develop agriculture, industry, forestry, and urbanization. Scholarly analysis suggests that wetland drainage for upland croplands represents the predominant cause of natural wetland depletion, with subsequent significant contributors including the transformation of natural wetland into flooded rice fields, urban areas, forestry activities, wetland farming, grazing lands, and peat extraction [13]. Among these contributors, forestry is a major driver of wetland loss in Sweden, Finland, and Estonia; furthermore, large amounts of dry peat have been mined since 1700 in Ireland, Northern Europe, and Western Russia for use as fuel or fertilizer, leading to wetland (peatland) degradation [13].

The previous emphasis on post-event punishment clearly cannot make up for the environmental damage that has been caused. Although scholars currently mainly study the relationship between land use and biodiversity, water resources, soil, climate change, economy, et cetera, Wu and Zhu [90] studied the impact of biodiversity in wetland parks on spatial changes in land use. Moreover, Maseko et al. [91] and Lan et al. [92] explored long-term land use, economy, and demographic changes in karst wetlands to detect possible microclimate changes. Additionally, Yang et al. [93] compared oblique and orthogonal random forest algorithms to conduct land-cover and land-use mapping studies in wetland parks. Notably, the fundamental purpose of land-use planning and zoning control in wetland parks is to maintain the authenticity of the ecosystem. Therefore, future research needs to delve deeply into the dynamics of land-use change, the effectiveness of legal and policy interventions, and the application of technology in wetland conservation. Moreover, from a macro perspective, planning, artificial intelligence, machine learning, and smart tools are crucial for quantitative and objective research on land use in wetland parks.

4.3. Nature-Based Solutions in Urban Wetland Parks Is a Popular Research Trend

Based on keyword frequency and centrality, clusters, citation bursts, et cetera, the popular keywords related to nature-based solutions in land use and the planning of urban areas were urban ecological security, landscape naturalness, recycled aggregates, nonhuman activity, human activity, spatiotemporal analysis, et cetera. The utilization of wetland systems in wetland parks to alleviate urban environmental problems has become a focal point of research. For instance, an artificial urban wetland park imitates a natural wetland, enables ecological environment recovery, and is widely used [94].

To prevent the overexploitation of wetlands, many scholars have studied tourist behaviors and perceptions [95], environmental monitoring [95], and material recycling [69] to protect the ecosystem. However, these studies are often unsustainable because they do not fully account for complex socioeconomic dynamics and policy-making processes. Through the rational use of land, biodiversity, resources (such as water, soil, land, and CO_2), and recycled materials, urban wetland parks can contribute to sustainable global development; however, significant challenges remain in achieving this goal. These challenges include balancing the needs of urban development and ecological protection, and assessing the long-term benefits and potential negative impacts of these measures.

Notably, nature-based solutions in urban wetland park land use and planning are a key research trend. Further, research should include a deep exploration of human–nature interactions [96], a consideration of the social value of wetland parks, and the development of new tools and frameworks to achieve the goals of assessing and guiding the design and management of urban wetland parks. Ultimately, achieving these goals requires interdisciplinary collaboration, combining knowledge and methods from different fields such as ecology, social sciences, economics, and urban planning to create sustainable and inclusive urban-development strategies. All these requirements imply the need for interdisciplinary education in this field and government policymakers with holistic expertise rather than expertise in a single area.

4.4. Areas of Research Focus: Famous National Wetland Parks in China and South Africa

Developing countries with large areas of wetlands (e.g., China, South Africa, and India) are popular and influential in wetland park research. In particular, iSimangaliso Wetland Park, Xixi National Wetland Park, and others are research focuses. China and South Africa's wetland resources do not only rank among the top in the world in terms of quantity. The complexity and diversity of their ecosystems also provide important case studies for global ecological research.

According to the National Forestry and Grassland Administration of the People's Republic of China, China added 18 wetlands of international importance, including Yanqing Wild Duck Lake, Jiuqu Eighteen Bay, and Baima Lake, to its list of wetlands; consequently, the country has a total of 82 wetlands that cover an area of 7.647 million ha, ranking fourth in the world [97]. Further, according to the National Biodiversity Association of South Africa, there are approximately 114,000 wetlands in South Africa, covering an area of approximately 9.27 million ha and accounting for 7.6% of land area. Furthermore, 27 of these wetlands, covering an area of approximately 570,000 ha, are among wetlands of international importance [98].

On one hand, it may be seen that developing countries have plentiful wetland resources. Therefore, wetlands in these countries are becoming the focus of research by scholars worldwide, especially for China and South Africa's national wetland parks. On the other hand, these developing countries have large populations, so they also have many scientific researchers studying wetlands, which may also be one reason wetlands have become a key research area. However, the challenges developing countries face in terms of resource allocation, regulatory capacity, and public awareness will exacerbate problems in policy formulation, community participation, and technology application. Hence, further study is needed. For example, China's national-level wetland parks, which are mainly divided into two categories, are managed by the National Forestry and Grassland Administration and the Ministry of Housing and Urban-Rural Development (note: Hong Kong, Macao, and Taiwan are excluded from the regulatory ambit) [99]. The former regulatory body has no precise requirements about the geographical distribution of wetlands, does not need to be consulted in urban planning areas, and has a wider and more diverse source of construction funds than the latter. These factors affect the spatial distribution and development of national wetland parks. Some wetlands have been drained in Indonesia for industrial plantations and smallholder agriculture [99,100].

4.5. Developed Countries Are Active and Influential in Wetland Park Research

This study indicates that the research generated from wetland parks correlates to countries or regions' economic development. As noted in Section 3.4, most developed countries produced many papers on wetland parks. The results show that, except for China, South Africa, and India, developed countries are more active in research and have had a more significant impact on wetland park research than developing countries. The research on wetlands in European and American countries mainly focuses on natural wetlands and wetlands constructed in national parks [101]. The number of wetland parks is highly correlated with per capita GDP and population density: The greater the population density and the higher the per capita economic level, the higher the demand for national wetland parks [99]. In the future, developed countries may recruit more PhD researchers from developing countries to nurture the next generation of developing countries' research in wetland parks and raise global awareness about wetland park construction.

Ecological construction and economic development are closely related, and the development of a regional economy is the basis for the orderly development of wetland parks. Developed countries have relatively advanced experimental equipment, laboratories, and technical expertise; hence, they have become influential in wetland park research. In practice, the policy and economic and cultural backgrounds of different regions directly impact the construction and management of wetland parks. For example, developed countries have abundant funds, sound policy systems, and active environmental protection awareness to manage wetlands. However, geographical differences in wetland regulations have not received sufficient attention in current research. Wetland park construction encompasses multiple skills, technologies, disciplines, departments, et cetera, which requires considerable economic support. Xu et al. [102] suggested that China should enhance the funding arrangement for national wetland park construction and increase the construction of national wetland parks in poor areas in the west and the provinces that have excellent wetland ecological environments.

The market-oriented transformation of wetland ecological value is of great importance. The protection and management of wetlands has costs, and the survival and development of surrounding communities is also closely related to wetlands in practice. However, most current studies tend to ignore the impact of socioeconomic factors on wetland conservation effectiveness, especially in assessing the effectiveness of wetland management strategies in different socioeconomic contexts. Therefore, future research is needed to find a suitable business model that allows local communities to benefit commercially from biodiversity protection. Such an approach will motivate businessmen to invest [103].

4.6. Limitations

As with other research, this investigation has a few limitations: (1) The study used bibliometrics via CiteSpace and VOSViewer to study wetland parks, but other related parks were not included. (2) Synonyms of 'wetland park' were not included in this study. (3) Non-English articles were excluded. Notably, the number of Chinese articles is probably high because China is the greatest producer of research papers in this field. (4) This article does not analyze differences in wetland management and supervision in different geographical locations. (5) The study might benefit from incorporating qualitative methods, such as expert interviews or content analysis of key papers, to add depth to the understanding of why certain themes or regions have emerged as focal points in wetland park research.

5. Conclusions

5.1. Theoretical and Practical Implications

Wetland parks aim to support urban ecological protection, flood control, and human welfare [104]. This study addressed research gaps and innovations by applying quantitative and visualized bibliometric methods via CiteSpace and VOSViewer in the research of wetland parks. This investigation analyzed research focuses, influential countries, research trends, et cetera through knowledge mapping and identified the theoretical implications of wetland park research for academia. The high frequency and centrality of the keywords indicate the substantial influence of wetland parks. The large cluster and citation bursts and the number of cited articles reflect the influence of the research subjects and trends.

The results of this study have some implications for managers and governments regarding the protection, monitoring, and management of wetland parks:

(1) Between 1996 and 2022, the research trend of wetland parks has shifted from basic community structure exploration to complex ecosystem service assessment and management strategy formulation. This shift reflects the progress of science and technology and the new challenges that global environmental changes have placed on wetland park protection.

(2) Nature-based solutions are essential and ecologically sound for rural and urban wetland park land use and planning. As the public seeks health, comfort, and green lifestyles, wetland parks are planned and constructed to become ecotourism destinations. A comprehensive consideration of wetland park development would involve designing and constructing wetland parks by ecologists, geographers, urban and rural planners, landscape architects, workers, governors, managers, et cetera, to create nature-based solutions.

(3) The increase in the number of tourists visiting wetland parks has caused different levelss of impact on wetland life. Balancing the relationship between the ecosystem and tourists is essential to reduce the damage resulting from park leisure activities on wetland biodiversity and improve the leisure experience of tourists [29]. The government and managers can help residents participate in the protection and construction of wetland parks through publicity and education, establishing a comprehensive legislation and supervision system, clarifying the management and ownership of wetlands, and standardization of the wetland development process. In addition, new artificial intelligence and digital technologies should be used to monitor and study, scientifically and quantitatively, the internal and external factors influencing wetland parks.

(4) Countries can allocate a budget to invest in constructing national wetland parks and promote balanced regional economic development alongside wetland conservation. Therefore, the distribution of national wetland parks could be diversified and balanced, which would be conducive to the sustainable development of wetland parks.

5.2. Future Research Directions

This article explored the literature from two databases—WoS and Scopus—to reveal the research frontiers and provide guidance on potential avenues for future research. However, wetland parks are closely related to the government and the public. Therefore, it is possible to compare the viewpoints of academia, the public, and the government in the future. Besides, a comparative in-depth study on the status, problems, and development of wetland parks in places such as China and BRICS countries can be another research direction. Additionally, water quality, ecosystem services, wetland parks, spatiotemporal analysis, et cetera, started experiencing rapid growth during the three years before 2022. This growth, which stopped in 2022, might continue in the future. This study mainly explored wetland park research from 1996 to 2022. Nevertheless, there are increasing numbers of papers on wetland parks from 2023/2024 and these papers, as well as future papers, need to be studied. It is also important for academia to conduct predictive analysis to offer better insights into future research on wetland parks.

To the global academic community, this article not only reveals the need for comprehensive, cross-border wetland research but also highlights the necessity for targeted research to explore how to overcome differences in management and regulation to ensure sustainable wetland conservation. Specifically, future research can provide an in-depth analysis of how policies, socioeconomic conditions, and cultural contexts in different geographical locations influence the development and implementation of wetland management strategies.

Author Contributions: Conceptualization, L.Z. and H.Z.; methodology, L.Z. and R.Y.M.L.; software, L.Z. and H.Z.; validation, L.Z. and R.Y.M.L.; formal analysis, L.Z. and H.Z.; investigation, L.Z. and H.Z.; resources, L.Z.; data curation, L.Z.; writing—original draft preparation, L.Z. and H.Z.; writing—review and editing, L.Z. and R.Y.M.L.; visualization, L.Z. and H.Z.; supervision, R.Y.M.L.; project administration, L.Z. and R.Y.M.L.; funding acquisition, L.Z. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by: (1) Panzhihua City's Municipal Guiding Science and Technology Program Project in 2021: A preliminary study on ecological protection and technical research methods of waterfront mountain city habitats [Grant No. 2021ZD-S-1]. (2) Panzhihua City's Municipal Guiding Science and Technology Program Project in 2023: Research on evaluation of green building environment and energy-saving design in resource-based industrial cities [Grant No. 2023ZD-S-46]. (3) Panzhihua Gangcheng Group Co., Ltd. & Panzhihua University's Scientific Research Collaborative Innovation Platform Technology Research and Development Project (the 1st batch): Research on landscape planning and design of Sponge City's greenway based on mountainous terrain [Grant No. HX2022096-8-1].

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are contained within the article.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Zhou, X.Y.; Dong, K.; Tang, Y.K.; Huang, H.Y.; Peng, G.S.; Wang, D.Q. Research Progress on the Decomposition Process of Plant Litter in Wetlands: A Review. *Water* **2023**, *15*, 3246. [CrossRef]
2. Zhang, Y.; Yan, J.; Cheng, X.; He, X. Wetland Changes and Their Relation to Climate Change in the Pumqu Basin, Tibetan Plateau. *Int. J. Environ. Res. Public Health* **2021**, *18*, 2682. [CrossRef]
3. Feng, H.J.; An, J.; Wang, H.Y.; Miao, X.Y.; Yang, G.B.; Feng, H.B.; Wu, Y.X.; Ma, X.Y.; Palsdottir, A.M.; Grahn, P.; et al. The Ecological Healthcare Benefits and Influences of Plant Communities in Urban Wetland Parks. *Forests* **2023**, *14*, 2257. [CrossRef]
4. Zhou, Y.; Zhao, L.Y.; Li, Z.H. Wetland Ecological Restoration and Payment for Ecosystem Service Standard: A Case Study of Ganjiangyuan National Wetland Park. *Wetlands* **2023**, *43*, 22. [CrossRef]
5. Islam, M.A.; Pavel, M.A.A.; Uddin, M.B.; Mamun, M.A.A.; Rahman, S.A.; Mathys, A.S.; Indraswari, K.; Bianchi, S.; Harada, K.; Sunderland, T. A tropical case study of tree diversity and productivity relationships in mixed species plantations in protected areas. *Int. J. Dev. Sustain.* **2017**, *6*, 1835–1847.
6. Wang, A.G.; Luo, D.C. Detailed Planning for Hanjiang River Culture Display Zone of Hanjiang River National Wetland Park (Gucheng)—An Exploration of the Culture Display-Ecological Environment System Coupling Concept. *J. Coast. Res.* **2020**, *105*, 99–103. [CrossRef]
7. Margaryan, L.; Prince, S.; Ioannides, D.; Röslmaier, M. Dancing with cranes: A humanist perspective on cultural ecosystem services of wetlands. *Tour. Geogr.* **2022**, *24*, 501–522. [CrossRef]
8. United Nations. World Wetlands Day 2 February. Available online: https://www.un.org/en/observances/world-wetlands-day (accessed on 5 February 2023).
9. Stefanakis, A.I. The Role of Constructed Wetlands as Green Infrastructure for Sustainable Urban Water Management. *Sustainability* **2019**, *11*, 6981. [CrossRef]

10. Dayathilake, D.D.T.L.; Lokupitiya, E.; Wijeratne, V.P.I.S. Estimation of Soil Carbon Stocks of Urban Freshwater Wetlands in the Colombo Ramsar Wetland City and their Potential Role in Climate Change Mitigation. *Wetlands* **2021**, *41*, 29. [CrossRef]
11. Yang, L.; Zhang, Z.; Zhang, W.; Zhang, T.; Meng, H.; Yan, H.; Shen, Y.; Li, Z.; Ma, X. Wetland Park Planning and Management Based on the Valuation of Ecosystem Services: A Case Study of the Tieling Lotus Lake National Wetland Park (LLNWP), China. *Int. J. Environ. Res. Public Health* **2023**, *20*, 2939. [CrossRef]
12. Huang, X.J.; Wu, Z.F.; Zhang, Q.F.; Cao, Z. How to measure wetland destruction and risk: Wetland damage index. *Ecol. Indic.* **2022**, *141*, 109126. [CrossRef]
13. Fluet-Chouinard, E.; Stocker, B.D.; Zhang, Z.; Malhotra, A.; Melton, J.R.; Poulter, B.; Kaplan, J.O.; Goldewijk, K.K.; Siebert, S.; Minayeva, T.; et al. Extensive global wetland loss over the past three centuries. *Nature* **2023**, *614*, 281–286. [CrossRef]
14. Christensen, T.R. Wetland emissions on the rise. *Nat. Clim. Change* **2024**, *14*, 210–211. [CrossRef]
15. Li, Z.; Ma, L.; Gou, D.; Hong, Q.; Fai, L.; Xiong, B. The Impact of Urban Development on Wetland Conservation. *Sustainability* **2022**, *14*, 13747. [CrossRef]
16. Tan, X.; Peng, Y. Scenic beauty evaluation of plant landscape in Yunlong Lake wetland park of Xuzhou City, China. *Arab. J. Geosci.* **2020**, *13*, 701. [CrossRef]
17. Mitsch, W.J.; Zhang, L.; Griffiths, L.N.; Bays, J. Contrasting two urban wetland parks created for improving habitat and downstream water quality. *Ecol. Eng.* **2023**, *192*, 106976. [CrossRef]
18. Joubert, L.; Pryke, J.S.; Samways, M.J. Past and present disturbances influence biodiversity value of subtropical grassland ecological networks. *Biodivers. Conserv.* **2016**, *25*, 725–737. [CrossRef]
19. Lee, T.H.; Hsieh, H.P. Indicators of sustainable tourism: A case study from a Taiwan's wetland. *Ecol. Indic.* **2016**, *67*, 779–787. [CrossRef]
20. Chen, G.D.; Tang, P.; Wang, H. Boundary Determination of Lake-Type Wetland Park Based on GIS Multifactor Analysis. *Comput. Intell. Neurosci.* **2022**, *2022*, 6161491. [CrossRef]
21. Zhang, M.; Huang, Y.; Shen, S.; Ye, Y.; Liao, Q.; Wang, W.; Liu, L.; Zhu, X.; Guo, J. Study on the Protection and Sustainable Development of Scenic Resources—A Case Study of Qingxiushan Scenic Spot in Nanning City. *J. Nat. Conserv.* **2023**, *72*, 126348. [CrossRef]
22. Xu, S.J.; He, X.L. Estimating the recreational value of a coastal wetland park: Application of the choice experiment method and travel cost interval analysis. *J. Environ. Manag.* **2022**, *304*, 114225. [CrossRef] [PubMed]
23. Li, L.P.; Li, L.F. The Construction Path and Protection Measures of Wetland Park from the Perspective of National Participation in the New Era. *Adv. Multimed.* **2022**, *2022*, 6081375. [CrossRef]
24. Tan, X.H.; Li, X.H.; Peng, Y.L. Aesthetic Evaluation of Plant Landscape Based on Principal Factor Analysis and Sbe in Wetland Park—A Case Study of Jinlong Lake Wetland Park (China). *J. Environ. Eng. Landsc. Manag.* **2021**, *29*, 40–47. [CrossRef]
25. Pasley, J. Remediation in Urban Ecology: How Remediative Park Design in Montgomery, Al Can Influence Its Future Development. Ph.D. Dissertation, Auburn University, Auburn, AL, USA, 2013.
26. Zhou, Z.H.; Wang, S.Q.; Zhao, M.; Zhi, F. Research on Art Design of Urban Wetland Park Planning Based on the Concept of Sustainable Development. *Ecol. Chem. Eng. S-Chem. Inz. Ekol. S* **2023**, *30*, 175–181. [CrossRef]
27. Zhang, X.L.; Yu, X.X.; Zhang, Z.H.; Xu, Z.J.; Xu, S.J.; Xu, B. Ecosystem service values of wetlands of the National Wetland Park of Wu River, northern China. *For. Chron.* **2013**, *89*, 147–152. [CrossRef]
28. Chen, X.; Cui, F.; Lei, W.; Liu, Y.; Zhang, X. Evaluation and Development of DHGF Model for Eco-Health Tourism Resources in Hong Kong Wetland Park. *Sustainability* **2022**, *14*, 15532. [CrossRef]
29. Zhang, J.N.; Zhu, X.; Gao, M. The Relationship between Habitat Diversity and Tourists' Visual Preference in Urban Wetland Park. *Land* **2022**, *11*, 2284. [CrossRef]
30. Tait, M.K.; Brunson, M.W. Barriers and opportunities for cooperative wetland management: A case study in the greater Rocky Mountain National Park ecosystem. *Wetl. Ecol. Manag.* **2022**, *30*, 257–272. [CrossRef]
31. Hart, L.A.; Bowker, M.B.; Tarboton, W.; Downs, C.T. Species Composition, Distribution and Habitat Types of Odonata in the iSimangaliso Wetland Park, KwaZulu-Natal, South Africa and the Associated Conservation Implications. *PLoS ONE* **2014**, *9*, e92588. [CrossRef]
32. Lin, P.; Chen, L.; Luo, Z. Analysis of Tourism Experience in Haizhu National Wetland Park Based on Web Text. *Sustainability* **2022**, *14*, 3011. [CrossRef]
33. Chai, Y.H.; Yu, T.Y.; Sun, X.; Wei, H.; Yu, H.X. Phytoplankton Community Structure and Its Relationship with Environmental Factors in Taihu National Wetland Park in Northeast China. *Appl. Ecol. Environ. Res.* **2021**, *19*, 4389–4402. [CrossRef]
34. Xu, Y.; Zhang, X.L.; Liu, X.J.; Zhang, Z.H. Biodiversity and Spatiotemporal Distribution of Spontaneous Vegetation in Tangdao Bay National Wetland Park, Qingdao City, China. *Int. J. Environ. Res. Public Health* **2022**, *19*, 11665. [CrossRef]
35. Hao, S.; Wang, C.; Lin, H. Design and assessment of biodiversity in urban wetland parks: Take Liupanshui Minghu national wetland park as an example. *Shengtai Xuebao* **2019**, *39*, 5967–5977. [CrossRef]
36. Van Cuong, C.; Dart, P.; Brown, S.; Van Thang, T.; Le, V.T.M. Enhancing bird biodiversity through improved water management in a Viet nam wetland national park. *Parks* **2019**, *25*, 55–68. [CrossRef]
37. Huang, S.T.; Xiao, X.; Tian, T.; Che, Y. Seasonal influences on preferences for urban blue-green spaces: Integrating land surface temperature into the assessment of cultural ecosystem service value. *Sust. Cities Soc.* **2024**, *102*, 105237. [CrossRef]

38. Liu, F.; Lu, J.B. Ecological engineering approaches to restoring the aquatic biological community of an urban pond ecosystem and its effects on water quality—A case study of the urban Xixi National Wetland Park in China. *Knowl. Manag. Aquat. Ecosyst.* **2021**, *422*, 24. [CrossRef]
39. Song, S.; Albert, C.; Prominski, M. Exploring integrated design guidelines for urban wetland parks in China. *Urban For. Urban Green.* **2020**, *53*, 126712. [CrossRef]
40. Xie, K. Analysis on Design of Urban Wetland Landscape Park. In Proceedings of the 2nd International Conference on Arts, Design and Contemporary Education (ICADCE), Moscow, Russia, 23–25 May 2016; pp. 569–571.
41. Lin, Y.; Wang, D.M.; Farooq, T.H.; Luo, K.; Wang, W.Y.; Qin, M.X.; Chen, S.Q. Effects of restoration strategies on wetland: A case-study of Xinqiang River National Wetland Park. *Land Degrad. Dev.* **2022**, *33*, 1114–1127. [CrossRef]
42. Guan, D.J.; Ran, B.W.; Zhou, L.L.; Jin, C.J.; Yu, X. Assessing and transferring social value of ecosystem services in wetland parks based on SolVES model. *Ecol. Indic.* **2023**, *157*, 111300. [CrossRef]
43. Lu, C.C. Evaluating urban ecological wetland parks using big data analytics and art vision. *Soft Comput.* **2023**, *27*, 14451–14467. [CrossRef]
44. Guan, H.M.; Huang, T.Z. Rural tourism experience research: A bibliometric visualization review (1996–2021). *Tour. Rev.* **2022**, *78*, 761–777. [CrossRef]
45. Luo, F.; Li, R.Y.M.; Crabbe, M.J.C.; Pu, R. Economic development and construction safety research: A bibliometrics approach. *Saf. Sci.* **2022**, *145*, 105519. [CrossRef]
46. Zeng, L.; Li, R.Y.M.; Zeng, H. Weibo users and academia's foci on tourism safety: Implications from institutional differences and digital divide. *Heliyon* **2023**, *41*, 1621–1630. [CrossRef]
47. Song, L.; Li, R.Y.M.; Yao, Q. An informal institution comparative study of occupational safety knowledge sharing via French and English Tweets: Languaculture, weak-strong ties and AI sentiment. *Saf. Sci.* **2022**, *41*, 993–1005. [CrossRef]
48. United Nations. World Wetlands Day 2 February. Available online: https://www.un.org/zh/observances/world-wetlands-day/background (accessed on 2 May 2024).
49. United Nations. Word Wetland Day 2 February 2024 Wetlands and Human Wellbeing. Available online: https://www.worldwetlandsday.org/ (accessed on 23 April 2024).
50. Corlett, R.T. Trouble with the Gray Literature. *Biotropica* **2011**, *43*, 3–5. [CrossRef]
51. Chen, C. CiteSpace II: Detecting and visualizing emerging trends and transient patterns in scientific literature. *J. Am. Soc. Inf. Sci. Technol.* **2006**, *57*, 359–377. [CrossRef]
52. Zhang, Z.; Zou, Y. Research hotspots and trends in heritage building information modeling: A review based on CiteSpace analysis. *Humanit. Soc. Sci. Commun.* **2022**, *9*, 394. [CrossRef]
53. Wang, W.J.; Wang, Z.J. Retrospecting the researches and efforts on Lancang-Mekong water issues: A bibliometric perspective. *Water Policy* **2022**, *24*, 1930–1950. [CrossRef]
54. Chen, C. *CiteSpace: A Practical Guide for Mapping Scientific Literature*; Nova Science Publishers: Hauppauge, NY, USA, 2016.
55. Kleinberg, J. Bursty and Hierarchical Structure in Streams. *Data Min. Knowl. Discov.* **2003**, *7*, 373–397. [CrossRef]
56. Li, X.; Ma, E.; Qu, H. Knowledge mapping of hospitality research—A visual analysis using CiteSpace. *Int. J. Hosp. Manag.* **2017**, *60*, 77–93. [CrossRef]
57. Makhabel, B.; Mishra, P.; Danneman, N.; Heimann, R. *R: Mining Spatial, Text, Web, and Social Media Data*; Packt Publishing: Birmingham, UK, 2017; pp. 1–50.
58. Li, R.Y.M.; Li, B.; Zhu, X.; Zhao, J.; Pu, R.; Song, L. Modularity clustering of economic development and ESG attributes in prefabricated building research. *Front. Environ. Sci.* **2022**, *10*, 977887. [CrossRef]
59. Chen, C. The Citespace Manual. *Coll. Comput. Inform.* **2014**, *1*, 1–84.
60. Dell'Osbel, N.; Colares, G.S.; de Oliveira, G.A.; de Souza, M.P.; Barbosa, C.V.; Machado, E.L. Bibliometric Analysis of Phosphorous Removal Through Constructed Wetlands. *Water Air Soil Pollut.* **2020**, *231*, 117. [CrossRef]
61. Jin, R.Y.; Yuan, H.P.; Chen, Q. Science mapping approach to assisting the review of construction and demolition waste management research published between 2009 and 2018. *Resour. Conserv. Recycl.* **2019**, *140*, 175–188. [CrossRef]
62. Shukla, J.B.; Dubey, B. Effect of changing habitat on species: Application to Keoladeo National Park, India. *Ecol. Model.* **1996**, *86*, 91–99. [CrossRef]
63. Hart, R.; Appleton, C. A limnological synopsis of bhangazi south, a dystrophic coastal lake in the greater st lucia wetland park (kwazulu/natal), with comments on its conservation value. *S. Afr. J. Aquat. Sci.* **1997**, *23*, 34–54. [CrossRef]
64. Chapman, K.L.; Lawes, M.J.; Macleod, M.M. Evaluation of non-lethal control methods on problematic samango monkeys in the Cape Vidal Recreation Reserve, greater St. Lucia Wetland Park. *S. Afr. J. Wildl. Res.* **1998**, *28*, 89–99.
65. Ministry of Housing and Urban-Rural Development of the People's Republic of China. Measures for the Administration of National Urban Wetland Parks (for Trial Implementation). Available online: https://www.mohurd.gov.cn/gongkai/zhengce/zhengcefilelib/200502/20050217_157123.html (accessed on 2 February 2023).
66. Ministry of Housing and Urban-Rural Development of the PRC. Guidelines for the Planning and Design of Urban Wetland Parks (for Trial Implementation). Available online: https://www.mohurd.gov.cn/gongkai/zhengce/zhengcefilelib/200507/20050704_157138.html (accessed on 13 May 2023).
67. Franks, J.; Stolz, J.F. Flat laminated microbial mat communities. *Earth-Sci. Rev.* **2009**, *96*, 163–172. [CrossRef]

68. Adam, E.; Mutanga, O.; Abdel-Rahman, E.M.; Ismail, R. Estimating standing biomass in papyrus (*Cyperus papyrus* L.) swamp: Exploratory of in situ hyperspectral indices and random forest regression. *Int. J. Remote Sens.* **2014**, *35*, 693–714. [CrossRef]
69. Poon, C.S.; Chan, D. The use of recycled aggregate in concrete in Hong Kong. *Resour. Conserv. Recycl.* **2007**, *50*, 293–305. [CrossRef]
70. Adam, E.; Mutanga, O. Spectral discrimination of papyrus vegetation (*Cyperus papyrus* L.) in swamp wetlands using field spectrometry. *ISPRS J. Photogramm. Remote Sens.* **2009**, *64*, 612–620. [CrossRef]
71. Li, H.N.; Chau, C.K.; Tang, S.K. Can surrounding greenery reduce noise annoyance at home? *Sci. Total Environ.* **2010**, *408*, 4376–4384. [CrossRef]
72. Meng, W.Q.; He, M.X.; Hu, B.B.; Mo, X.Q.; Li, H.Y.; Liu, B.Q.; Wang, Z.L. Status of wetlands in China: A review of extent, degradation, issues and recommendations for improvement. *Ocean Coast. Manag.* **2017**, *146*, 50–59. [CrossRef]
73. Zheng, Y.M.; Zhang, H.Y.; Niu, Z.G.; Gong, P. Protection efficacy of national wetland reserves in China. *Chin. Sci. Bull.* **2012**, *57*, 1116–1134. [CrossRef]
74. Whyte, A.; Ferentinos, K.P.; Petropoulos, G.P. A new synergistic approach for monitoring wetlands using Sentinels-1 and 2 data with object-based machine learning algorithms. *Environ. Modell. Softw.* **2018**, *104*, 40–54. [CrossRef]
75. Buah-Kwofie, A.; Humphries, M.S.; Pillay, L. Bioaccumulation and risk assessment of organochlorine pesticides in fish from a global biodiversity hotspot: iSimangaliso Wetland Park, South Africa. *Sci. Total Environ.* **2018**, *621*, 273–281. [CrossRef]
76. Leslie, A.J.; Spotila, J.R. Alien plant threatens Nile crocodile (*Crocodylus niloticus*) breeding in Lake St. Lucia, South Africa. *Biol. Conserv.* **2001**, *98*, 347–355. [CrossRef]
77. Lai, D.Y.; Lam, K.C. Phosphorus sorption by sediments in a subtropical constructed wetland receiving stormwater runoff. *Ecol. Eng.* **2009**, *35*, 735–743. [CrossRef]
78. Wang, R.X.; Yang, X.J. Waterbird Composition and Changes With Wetland Park Construction at Lake Dianchi, Yunnan Guizhou Plateau. *Mt. Res. Dev.* **2021**, *41*, R29–R37. [CrossRef]
79. Li, N.; Tian, X.; Li, Y.; Fu, H.C.; Jia, X.Y.; Jin, G.Z.; Jiang, M. Seasonal and Spatial Variability of Water Quality and Nutrient Removal Efficiency of Restored Wetland: A Case Study in Fujin National Wetland Park, China. *Chin. Geogr. Sci.* **2018**, *28*, 1027–1037. [CrossRef]
80. Zhao, Z.F.; Feng, N.; Qiu, X.C.; Sun, X.Y.; Wang, S.Q.; Ouyang, H. Distribution Characteristics and Pollution Evaluation of Heavy Metals in Water Environment of Taiyangshan Wetland in Ningxia. *J. Ecol. Rural Environ.* **2022**, *38*, 168–175. [CrossRef]
81. Wang, R.M.; Cui, L.J.; Li, J.; Li, W.; Zhu, Y.N.; Hao, T.; Liu, Z.J.; Lei, Y.R.; Zhai, X.J.; Zhao, X.S. Response of nir-type rhizosphere denitrifier communities to cold stress in constructed wetlands with different water levels. *J. Clean Prod.* **2022**, *362*, 132377. [CrossRef]
82. Lin, P.; Yan, Z.F.; Li, C.T. *Luteimonas cellulosilyticus* sp. nov., Cellulose-Degrading Bacterium Isolated from Soil in Changguangxi National Wetland Park, China. *Curr. Microbiol.* **2020**, *77*, 1341–1347. [CrossRef]
83. Zhao, R.F.; Zhang, X.Y.; Zhang, L.H.; Wang, Y.B. Plant Diversity and Soil Properties at Different Wetland Restoration Stages along a Major River in the Arid Northwest of China. *Wetlands* **2021**, *41*, 13. [CrossRef]
84. Research Highlight. The manicured wetland that sucks up more carbon than a natural marsh. *Nature* **2020**, *577*, 452. [CrossRef]
85. Wang, Y.J.; Lan, Q.X.; Jiang, F.; Chen, C.F. Construction of China's low-carbon competitiveness evaluation system A study based on provincial cross-section data. *Int. J. Clim. Chang. Strateg. Manag.* **2020**, *12*, 74–91. [CrossRef]
86. Li, B.Y.; Pan, Y.Q.; Li, L.X.; Kong, M.S. Life Cycle Carbon Emission Assessment of Building Refurbishment: A Case Study of Zero-Carbon Pavilion in Shanghai Yangpu Riverside. *Appl. Sci.* **2022**, *12*, 9989. [CrossRef]
87. Sun, C.L.; Zhu, S.X.; Zhao, B.; Li, W.J.; Gao, X.Y.; Wang, X.D. Effect of Land Use Conversion on Surface Soil Heavy Metal Contamination in a Typical Karst Plateau Lakeshore Wetland of Southwest China. *Int. J. Environ. Res. Public Health* **2020**, *17*, 84. [CrossRef]
88. Li, W.B.; Wang, D.Y.; Wang, Q.; Liu, S.H.; Zhu, Y.L.; Wu, W.J. Impacts from Land Use Pattern on Spatial Distribution of Cultivated Soil Heavy Metal Pollution in Typical Rural-Urban Fringe of Northeast China. *Int. J. Environ. Res. Public Health* **2017**, *14*, 336. [CrossRef]
89. Duy, P.N.; Chapman, L.; Tight, M.; Linh, P.N.; Thuong, L.V. Increasing vulnerability to floods in new development areas: Evidence from Ho Chi Minh City. *Int. J. Clim. Change Strateg. Manag.* **2018**, *10*, 197–212. [CrossRef]
90. Wu, H.; Zhu, Q. Rethinking of the Practice of Subregion Control of National Park and Choices of Legal Approaches. *Wetl. Sci. Manag.* **2023**, *19*, 79–82.
91. Maseko, M.S.T.; Ramesh, T.; Kalle, R.; Downs, C.T. Response of Crested Guinea-fowl (*Guttera edouardi*), a forest specialist, to spatial variation in land use in iSimangaliso Wetland Park, South Africa. *J. Ornithol.* **2017**, *158*, 469–477. [CrossRef]
92. Lan, F.N.; Zhao, Y.; Jiang, Z.C.; Yu, Y.; Li, Y.Q.; Caballero-Calvo, A.; Gonzalez, J.M.S.; Rodrigo-Comino, J. Exploring long-term datasets of land use, economy, and demography variations in karst wetland areas to detect possible microclimate changes. *Land Degrad. Dev.* **2022**, *33*, 2743–2756. [CrossRef]
93. Yang, Z.H.; Su, Q.; Chen, Z.H.; Bai, J.W.; Qian, X.Q.; Zhang, Z.M. Correlation between ldi-based land use types and water quality in sanshan island of Taihu Lake National Wetland Park, Suzhou. *Huanjing Kexue* **2017**, *38*, 104–112. [CrossRef] [PubMed]
94. Wang, X.A.; Du, E.B. Urban Wetland Park Design Based on Sewage Treatment. *Fresenius Environ. Bull.* **2021**, *30*, 7905–7908.
95. Zhu, Y.; Zaidin, N.; Pu, Y. Local Residents Becoming Local Tourists: Value Co-Creation in Chinese Wetland Parks during the COVID-19 Pandemic. *Sustainability* **2022**, *14*, 12577. [CrossRef]

96. Zhai, X.Z.; Lange, E. Using Social Media to Explore Perceptions of Ecosystem Services by Nature-Based Solution Projects. *Landsc. Archit. Front.* **2020**, *8*, 58–77. [CrossRef]
97. WWW.CHINANEWS.COM. China Has Added 18 Wetlands of International Importance. Available online: https://www.chinanews.com.cn/gn/2023/02-02/9945776.shtml (accessed on 2 February 2023).
98. Zhou, S.; Ma, F.; Li, Q. Strengthening Wetland Protection for Sustainable Development (International Perspective). Available online: http://world.people.com.cn/n1/2022/0107/c1002-32325778.html (accessed on 4 February 2023).
99. Zhou, D.; Liu, Y.; Wang, F.; Yu, J.; Yang, J.; Sun, D.; Jia, Y.; Guan, B.; Ma, Y.; Wang, X.; et al. Spatial Distribution and Interfering Factors of the National Wetland Park in China. *J. Ludong Univ. (Nat. Sci. Ed.)* **2023**, *39*, 1–10. [CrossRef]
100. Miettinen, J.; Shi, C.H.; Liew, S.C. Land cover distribution in the peatlands of Peninsular Malaysia, Sumatra and Borneo in 2015 with changes since 1990. *Glob. Ecol. Conserv.* **2016**, *6*, 67–78. [CrossRef]
101. Page, S.E.; Hooijer, A. In the line of fire: The peatlands of Southeast Asia. *Philos. Trans. R. Soc. B Biol. Sci.* **2016**, *371*, 20150176. [CrossRef]
102. Xu, H.; Li, H.; Niu, Z.; Zhang, J.; Ling, W. An Analysis of Problems in Construction of National Wetland Parks and Suggestions for Solutions. *Wetl. Sci. Manag.* **2020**, *16*, 44–47.
103. Paulson Institute. *A Preliminary Study on the Funding Investment and Funding Mechanism for Biodiversity Conservation in China*; The Foreign Environmental Cooperation Center (Referred to as FECO): Beijing, China, 2023; pp. 2–14.
104. Zhai, X.Z.; Lange, E. The Influence of COVID-19 on Perceived Health Effects of Wetland Parks in China. *Wetlands* **2021**, *41*, 101. [CrossRef] [PubMed]