ZIBELINE INTERNATIONAL™ PUBLISHING

Water Conservation & Management (WCM)

DOI: http://doi.org/10.26480/wcm.02.2025.292.299

ISSN: 2523-5664 (Print)
ISSN: 2523-5672 (Online)
CODEN: WCMABD

RESEARCH ARTICLE

MODELING WATER RESERVOIRS: BIBLIOMETRIC ANALYSES FOR THE PERIOD OF 2000-2023

Dilbar Allayorova[a*], Davronjon Allayorov[b,c], Alisher Khodjiyev[d]

[a]Scientific Research Institute of Irrigation and Water Problems, Tashkent, Uzbekistan
[b]Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, National Research University, Tashkent, Uzbekistan
[c]Tashkent State Transport University, Tashkent, Uzbekistan
[d]Tashkent State Agrarian University, Tashkent, Uzbekistan
**Corresponding Author Email: allayorova.2701@gmail.comcom*

Article History:

Received 12 February 2025
Revised 14 March 2025
Accepted 25 March 2025
Available online 29 April 2025

ABSTRACT

Reservoirs are crucial for agriculture and energy generation, and scientists are exploring ways to increase their capacity, reduce water losses, and monitor changes due to hydrodynamic processes. Currently, hydrodynamic processes in reservoirs are studied using physical and mathematical models. This study used bibliometric analyses to investigate the importance of water reservoirs. Data from 2000 to 2023, sourced from the Web of Science database, were analyzed using the keywords "Reservoirs", "Dynamics", and "Sediment". The analysis of 205 publication revealed that 82% of publications were scientific articles, and there is a positive trend with a correlation of 86%. The top 10 authors contributed approximately 20% of the publications. Chinese scientific organizations conduct numerous studies on hydrodynamics and sedimentation processes in reservoirs. The Chinese Academy of Sciences was the top institution, with 15 records. The study of water bodies through modeling in a climate change context has become increasingly popular. Water Resources Research is the leading journal for publishing research on reservoir flow dynamics and sedimentation processes. The study of water bodies through modeling in the context of climate change has become increasingly popular. The study used bibliometric tools to analyze the co-occurrence of authors, keywords, thematic evolution, and interrelationships. The results revealed four key research areas: sediment and its transportation, reservoirs, and dynamics. Results also show that almost 50% of articles focus on various models used to study sediment movement in reservoirs, including numerical, mathematical, and hydrodynamic models. Finally, bibliometric analysis of water reservoirs shows numerical, mathematical, and hydrodynamic modeling of flow dynamics and sedimentation of reservoirs are expected to remain dominant in the upcoming decade.

KEYWORDS

water reservoir, sediment, review, bibliometric analaysis, Web of Science, WOSviewer, Biblioshiny.

1. INTRODUCTION

One of the main ways to regulate river flow is to build reservoirs. Reservoirs play an important role in providing water for agriculture and generating energy (Olsson et al., 2008; Busker et al., 2019; Ikramova, 2021; P.O, H.O, and D.D, 2019). The need for water is continuously rising due to population growth, industrial expansion, and the increasing intensity of agriculture. Ensuring the sustainable management of water resources is becoming a top environmental priority for the nations (Zouabi-Aloui et al., 2015). Therefore, today, scientists are looking for ways to increase the capacity of reservoirs, reduce water losses in reservoirs, and constantly monitor changes in reservoirs due to hydrodynamic processes (Ikramova, 2016; Gelda and Effler, 2007).

The dynamics of water movement in reservoirs is related to the direction of flow, the occurrence of flow velocity, pressure gradient, and frictional forces. As a result of the deformation process, the movement of bed load and suspended load and their transportation, the process of erosion and silting, the erosion of the reservoir bowl, and the formation of banks are observed (Olsson et al., 2008). Despite the development of the theory of flow formation, there are still many unsolved problems in the mechanism of the occurrence of many phenomena and the flow distribution laws (Warsa and Astuti, 2025). Scientists have always been searching for solutions to these problems.

A thorough understanding of open channel flow is essential for addressing various hydraulic engineering issues, including hydrodynamic processes, like reservoir erosion and sedimentation. The dynamic processes that occur as a result of flow spreading in the reservoir area depend on the morphological characteristics of the reservoir, that is, the slope of the reservoir boundary, depth, intensity of water exchange, etc (Zhao et al., 2023). These issues can arise in both natural water bodies like rivers, lakes, and estuaries as well as in man-made structures like dam reservoirs, spillways, and weirs (Zieminska-Stolarska et al., 2015). Since hydrodynamics is a complicated field, modeling water bodies has become increasingly popular in recent years (J. Li, Qi, and Fuhrman, 2019). To date, hydrodynamic processes in the reservoir have been studied using physical and mathematical models. Since the creation of a physical model of a reservoir and conducting applied laboratory research in it leads to

Quick Response Code	Access this article online	
	Website: www.watconman.org	**DOI:** 10.26480/wcm.02.2025.292.299

Cite The Article: Dilbar Allayorova, Davronjon Allayorov, Alisher Khodjiyev (2025). Modeling Water Reservoirs: Bibliometric Analyses For The Period Of 2000-2023. *Water Conservation & Management, 9(2): 292-299.*

financial difficulties, the use of mathematical models is widespread today. Extending the domains in specialized study helps to find the overall picture of completed issues. Bibliometrics, scientometrics, and informetrics are examples of metrics research. All of this research sought to get a knowledge of the dynamics of disciplines as represented in their literature (Hood and Concepcion, 2001; Yang et al., 2020). Bibliometric analysis is a useful and convenient method for analyzing publications in a particular field (Passas 2024; Yang et al., 2020). Rather than reviewing the scientific literature, which uses quantitative and qualitative approaches and is often subject to searcher bias, this quantitative method examines the metadata of scientific publications (Kannazarova et al., 2024).

Bibliometric analyses of water reservoirs have been investigated by many researchers due to their importance. For example, bibliometric analyses of water resources carrying capacity were studied, the water and sediment environment was investigated, current challenges in lakes and reservoirs were learned by the researchers, hydrological models were conducted and, ecohydrology in reservoirs and reservoir characterization were researched by researchers (Yang et al., 2022; Ziyang Guo et al., 2021; Long Ho and ·Peter Goethals, 2020; Fangling Qin et al., 2021; Apriniyadi et al., 2023; Kai Peng et al., 2019). The objective of this research is to examine existing knowledge on the scale of water reservoirs and identify the scientific articles and research areas that have had the most impact on the topic through a systematic review and predict the dynamic directions of research.

2. Methods And Materials

This study employs both keyword analysis and bibliometric analysis methods. The data was sourced from the Web of Science, which covered the years 2000 to 2023. This database was chosen because it has the most complete collection of high-quality papers from reputable publications.

In the beginning phase of the study, to collect the data, we started the research by searching for articles in the Web of Science database using the keywords “Reservoirs” and “Dynamics”. In the “Preprocessing” step, the search parameters were set to research articles, conference proceedings, and book chapters published between 2000 and 2023. The result was 564. Based on the functional tasks of reservoirs, subject areas were chosen as water resources, environmental science, engineering, and agriculture (Figure 1). The relevance of the articles to the research topic was reviewed in the “Data cleaning” step. In this step, it was found that half of the data was irrelevant to the topic. To ensure the relevance and accuracy of the data to subject areas, the keyword "sediment" was added to the search line, and 205 articles were selected for study.

In the middle phase of the study, the data sourced from Web of Science were evaluated and categorized according to various aspects. These were: annual number of publications that show a trend in the topic, list of top authors who have been doing quantitive work on this field, top institutions which are specialized in reservoir research, top countries trying to increase the efficiency of water use, top cited publications that have been the focus of academic communities, top cited journals over the past 23 years.

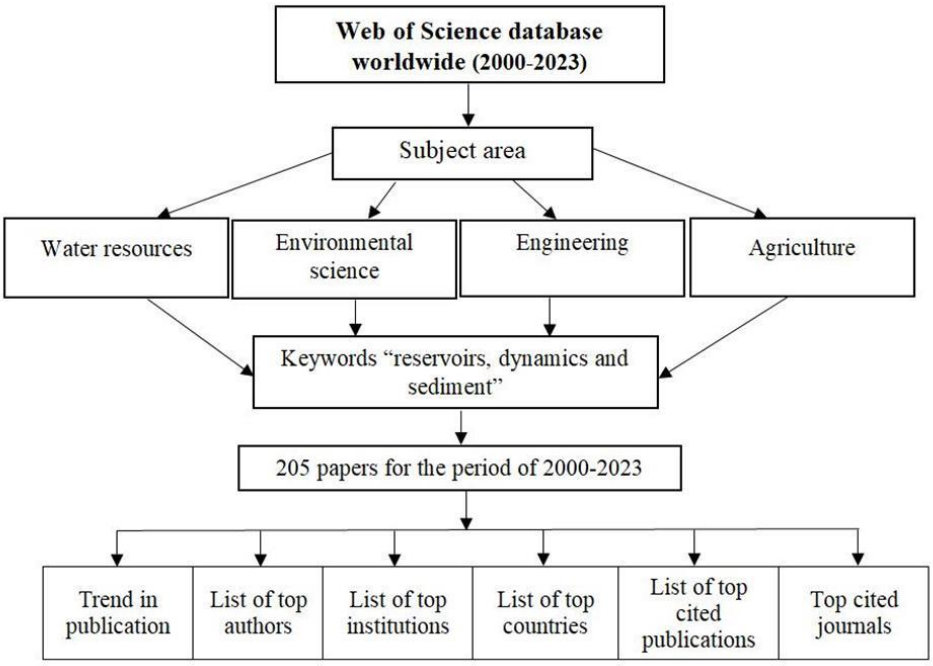

Figure 1: Scheme of the methodology

In the final phase, using bibliometric tools, the co-occurrence of authors, co-occurrence keywords, thematic evolution, and focus of countries and institutions was analyzed to explore the knowledge components and novelty of the research area based on the clusters of the most common keywords in the literature. The VOSviewer software (version 1.6.17) and Biblioshiny developed and have well-developed tools for research mapping and bibliometric analysis, with a variety of analytical and visualization capabilities (Aria and Cuccurullo, 2017). The maps created by the VOSviewer are represented by nodes, and their size is proportional to the number of documents they describe. The nodes are connected to each other by links. The shorter the distance between the nodes, the more closely the document qualities being analyzed are related to each other.

3. Results And Discussion

3.1 Temporal trend in publication on water reservoir

The number and trends of publications over a selected period reflect the significance of a field within the scientific community. The results indicate that a total of 205 papers published between 2000 and 2023 addressed issues related to reservoir flow dynamics and sedimentation. Various subject clusters are present in the Web of Science database. Most of the articles analyzed are categorized into five primary clusters: 34% are in Water Resources, 31% in Environmental Science and Ecology, 22% in Engineering, 7% in Marine and Freshwater Biology, and 6% in the Geological cluster.

In general, the number of scientific works in this area shows a positive trend with an 86% correlation. At the beginning of the current century, the study of water bodies was not the focus of scientists. According to analysis, almost 85% of the publications were published after 2013, and in 2022, publications on “Reservoir flow dynamics and sedimentation” reached a peak, accounting for 10% of the total publications (Figure 2).

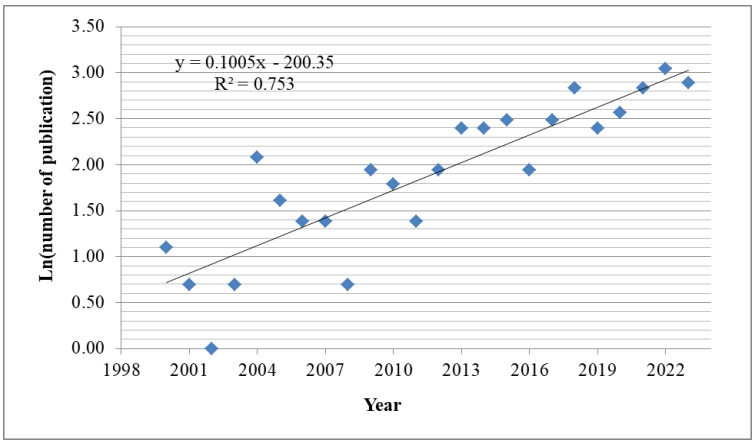

Figure 2: Trend in publications on reservoir research between 2000 and 2023

Moreover, our study shows that out of 205 papers, the largest number, 168 (82%), were research articles. This is followed by 40 (19.5%) proceeding papers and 2 (1%) review articles, whereas there were only 0.5 % book chapters.

3.2 Authors and their affiliated institutions

A total of 817 authors were identified during the analyses of publications. The top 10 authors (at least with three publications) are included in Figure 3. The top 10 authors have contributed approximately 20% of the publications. Authors Xu, Z.H., and Yang, Z.F. have the highest number of publications, each with 6 (almost 6%), followed by Chung, S.W., and Yi, Y.J., each with 4, and Bouffard, D., Cai, Y.P., Chen, Y., Huang, L., Lin, B.L., and Luo, L.C., each with 3 research papers. Between these lists of top authors, almost all top authors are related to Chinese research institutions.

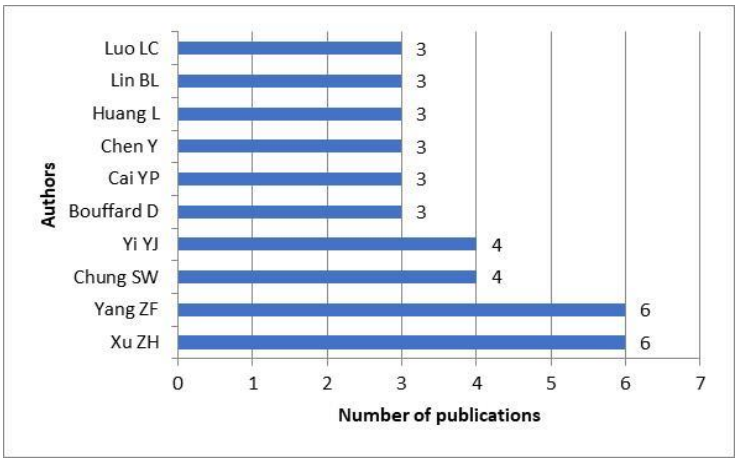

Figure 3: List of top 10 authors published on water reservoir

In terms of high-yield institutions, three hundred ninety different institutions cooperated to publish 205 papers related to reservoir flow dynamics and sedimentation. Figure 4 shows the top 14 productive institutions with respect to the number of publications in the period of 23 years. The results indicate that almost half of the top 14 institutions are from China. The Chinese Academy of Sciences takes first place in the record (15 records), followed by Tsinghua University (9 records), Hohai University (8 records), Wuhan University, Virginia Polytechnic Institute, and Beijing Normal University (each with 7 records).

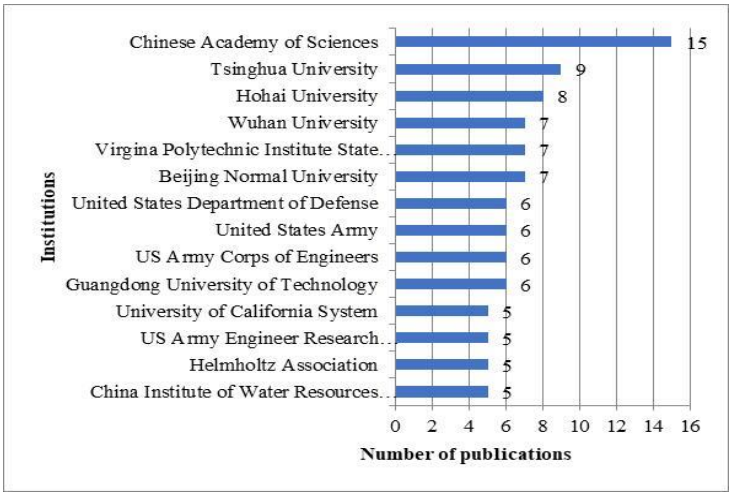

Figure 4: List of top institutions on water reservoir research

3.3 Top countries on water reservoir research

Countries whose industries are directly linked to water resources are paying great attention to hydrodynamics and sedimentation processes in reservoirs. The most productive countries in the field of water reservoir research between 2000 and 2023 are shown in Figure 5. China is leading with 80 publications, followed by the United States with 51, Germany with 14, Canada with 9, France and South Korea with 8 each, and Australia, Brazil, Poland, and Spain with 7 each (Figure 5).

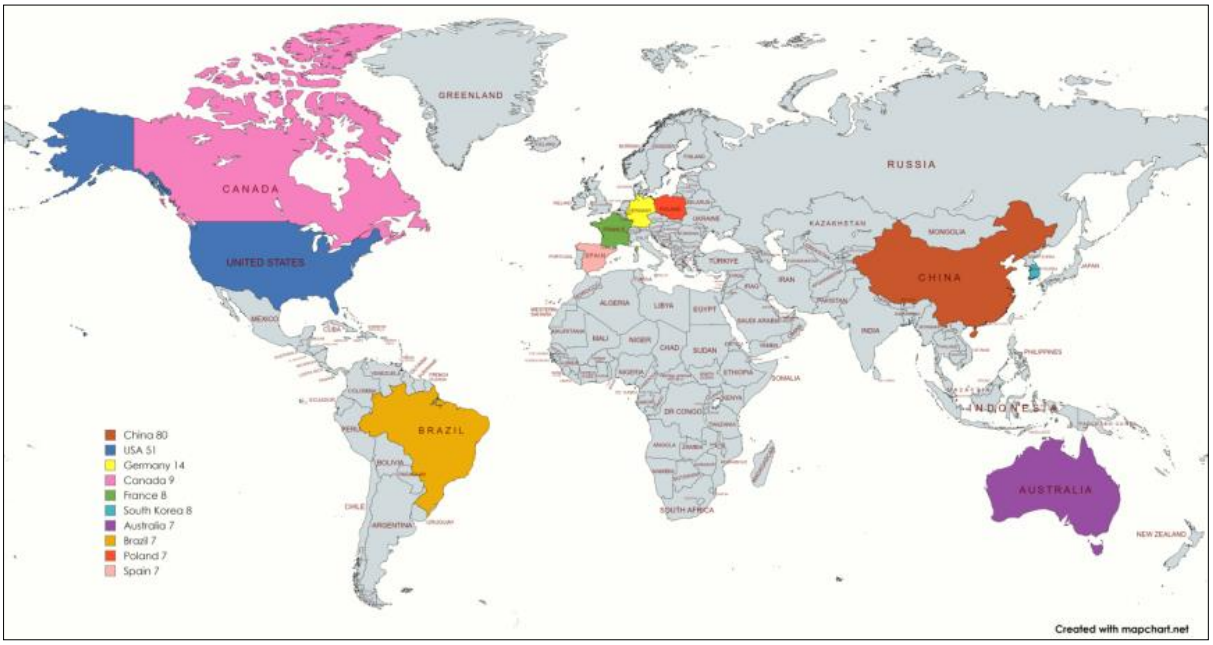

Figure 5: List of top countries on water reservoir

From the above, it is clear that, according to the analysis of the countries, affiliated institutions, and authors, a large number of studies on hydrodynamics and sedimentation processes in reservoirs are being conducted by Chinese scientific organizations and communities. The fundamental reason for this is the distribution of water resources in China is very uneven, meaning southern China has many rivers, the northern regions have fewer water resources, which poses problems for irrigation and industry, and this forces China to find ways to use water resources more efficiently (Yu et al., 2023; Minghong, 2015). This could be due to the country's numerous highly recognized research facilities and universities.

3.4 Top cited papers and journals on water reservoir research

Heated academic attention by the scientific community is determined by counting citations. But a large number of citations do not always mean heated attention. At the same time, the prestige of the journal also determines the quality of the article. Table 1 presents scientific articles on water reservoirs that have top academic attention, with the average annual citation being more than 10. From the analysis of listed articles, it was found that in recent years, the study of water bodies through modeling in the context of climate change has become increasingly popular.

Table 1: List of top cited publications on water reservoir from 2000 to 2023

No	Title	Journal	Corresponding author	PY	TC	Citation per year	Document type
1.	High Resolution Modeling of River-Floodplain-Reservoir Inundation Dynamics in the Mekong River Basin	Water Resources Research	Shin, S.	2020	57	19.0	Article
2.	Long-term alterations of flow regimes of the Mekong River and adaptation strategies for the Vietnamese Mekong Delta	Journal of Hydrology-Regional Studies	Binh, DV.	2020	56	18.7	Article
3.	Effects of local climate and hydrological conditions on the thermal regime of a reservoir at Tropic of Cancer, in southern China	Water Research	Wang, S.	2012	153	13.9	Article
4.	Effects of climate change on deep-water oxygen and winter mixing in a deep lake (Lake Geneva): Comparing observational findings and modeling	Water Resources Research	Schwefel, R.	2016	95	13.6	Article
5.	Water pollution risk simulation and prediction in the main canal of the South-to-North Water Transfer Project	Journal of Hydrology	Tang, CH.	2014	120	13.3	Article
6.	Impoundment Effects of the Three-Gorges-Dam on Flow Regimes in Two China's Largest Freshwater Lakes	Water Resources Management	Lai, XJ.	2014	113	12.6	Article
7.	Is water shortage risk decreased at the expense of deteriorating water quality in a large water supply reservoir?	Water Research	Xu, ZH.	2019	43	10.8	Article

The data presented in Table 1 and Figure 6 show that Water Resources Research, with an impact factor of 5.240, is the leading journal for publishing research on reservoir flow dynamics and sedimentation processes. Therefore, the results of the analyses show that 205 papers received 2874 citations in 85 journals. Figure 6 shows the top 10 journals with more than 80 citations from publications between 2000 and 2023. Almost 50% of citations for articles are in the top three journals: Water Resources Research with 290 citations, Journal of Hydrology with 287, and Water Research with 222 citations (Figure 6).

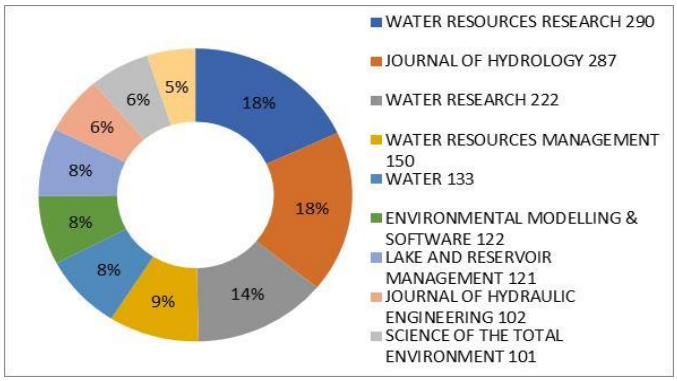

Figure 6: Top cited journals on water reservoir

3.5 Analysis of co-authors and keywords

Co-authorship analysis in bibliometric research examines collaboration processes among authors, organizations, and countries. It reveals patterns and relationships between authors based on the number of co-published publications. This analysis helps to identify collaborative relationships between researchers, institutions, and countries, while also revealing who is working together on scientific projects and publications and illuminating the structure and development processes of these relationships. In this study, based on the sourced data from the Web of Science, the VOSviewer was used to create maps of co-authorship and co-occurrence of keywords. A network of 817 authors emerged from the co-authorship analysis. And authors with at least seven publications on the topic of reservoirs were included. There are 64 items distributed over 22 clusters: cluster 1 (8 items), cluster 2 (7 items), cluster 3 (6 items), cluster 4 (5 items), cluster 5 (5 items), cluster 6 (4 items), cluster 7 (3 items), clusters 8 to 18 (2 items), and clusters 19 to 22 (1 item) (Figure 7).

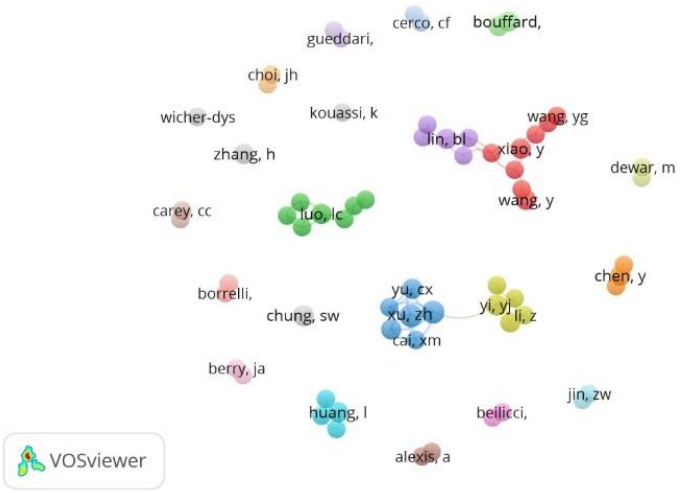

Figure 7: A network map of top co-authors based on overall link strength

The analysis identifies co-occurring keywords from similar articles or publications and measures the frequency and strength of relationships between them. This process can be visualized through network maps, where nodes represent keywords, and the connections between them represent the co-occurrence of words. 1282 keywords were identified as a result of the analysis. Among these keywords, excluding keywords with very low relevance and rarely used keywords (at least 45 repetitions of the keyword are selected to strengthen their co-occurrence), 35 elements were identified (Figure 8).

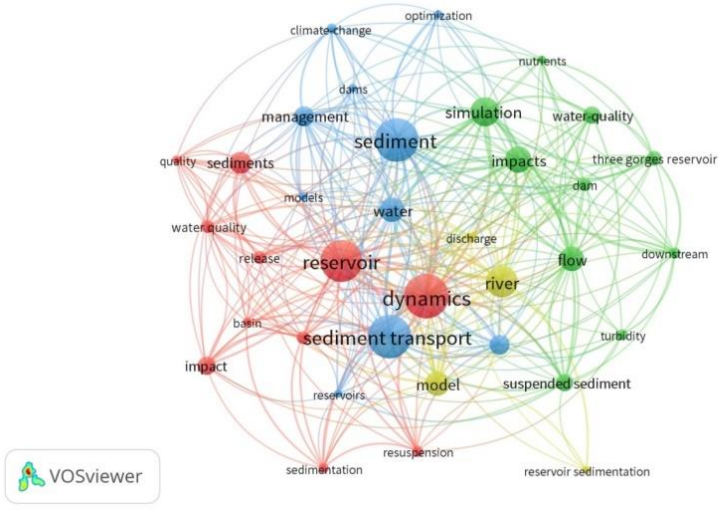

Figure 8: A network map of the top keywords based on total link strength

Based on the overall link strength, each extracted keyword is mapped to a node, creating a network map of all keywords. The importance of keywords is reflected in the size of the node. However, its proximity to other nodes indicates some related topics that occur frequently along with the topics under study. Figure 8 shows the 4 most relevant keywords during the studied period, which are sediment and its transportation, reservoir, and dynamic. These keywords are divided into 35 elements in 4 clusters: The red, cluster 1, mainly presents processes occurring in the reservoir (reservoir, dynamics, erosion, impact, quality, discharge, reservoir, resuspension, sediment, sediments); the green, cluster 2, is mainly focused on objects (dam, downstream, flow, impacts, nutrients, simulation, suspended sediment, Three Gorges Reservoir, stagnation); the

blue, cluster 3, is mainly focused on keywords related to reservoir management (climate change, dams, hydrodynamics, management, models, optimization, reservoirs, sediment, sediment transport, water); and the yellow, cluster 4, includes the following: (flow, model, reservoir sediment, river).

3.6 Thematic evolutions and interrelationship analysis

Thematic evolution helps researchers identify current and future research directions in their research area. In this study, 23 years of publications were examined in 4 stages (first 2000-2006, second 2007-2012, third 2013-2018, and fourth 2019-2023) (Figure 9). In the first stage, that is, from 2000 to 2006, the topics of "water," "simulation," and "dynamics" were the most common. This indicates that during these years, researchers mainly conducted scientific work on simulation dynamic processes in water bodies. From analyzing the second five-year period, we can see that researchers focus has changed significantly, but the topic "simulation" from the first period remained dominant in the second period as well. Compared to previous periods, significant thematic evolution had occurred in the third stage. Surprisingly, even during this period, "simulation" remained dominant. In the final stage (2019-2023), this stage can be called the true thematic evolution stage. The number of topics increased significantly during this phase.

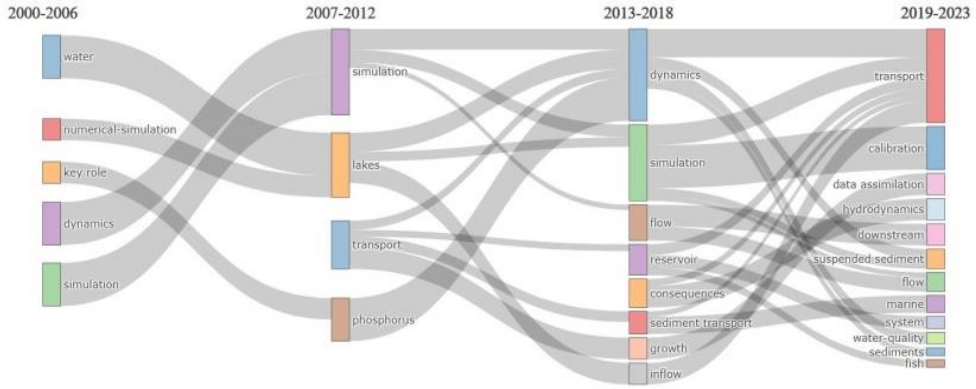

Figure 9: Thematic evolutions in years.

As can be seen from the graph above (Figure 9), it has almost tripled compared to the first and second periods. During this period, scientific publications were released on the following topics related to reservoirs: sediment, suspended sediment, sediment transport, water quality, and hydrodynamics. In all four stages analyzed above, it was observed that the topics "sediment," "dynamic," and "reservoir" were dominant. The interrelationships between countries, institutions, and their research areas also confirmed that the topics "sediment," "dynamic," and "reservoir" are dominant (Figure 10). This indicates that these topics will remain dominant in the upcoming decade.

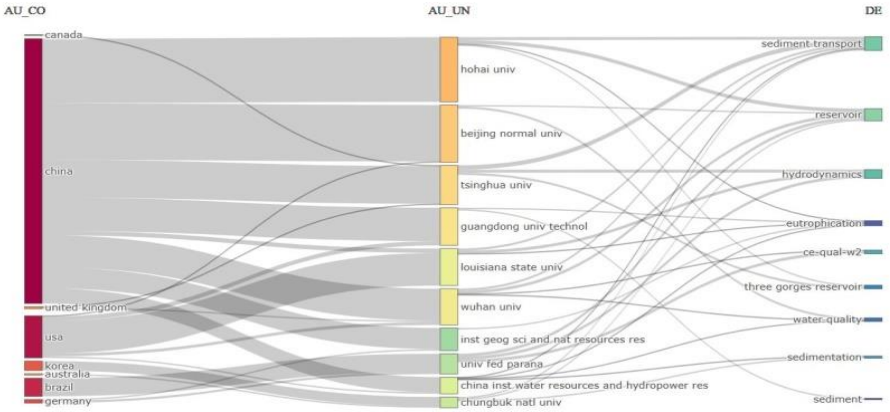

Figure 10: Interrelationship analysis: focus of countries and institutions

The objective of this research was to examine existing knowledge on the scale of water reservoirs and identify research areas that have had the most impact on the topic. As a result of the above analysis, we can say that the most studied topics in research on reservoirs are sediment transport, dynamics, and simulation. As a result of studying the articles, it became known that special attention was paid to various models used to study the movement of sediments in reservoirs according to reservoir hydrodynamics. Many studies have used various models to understand the basic concepts and theories related to sediment movement and hydrodynamics in reservoirs. For example, Zhen-Gang Ji, Michael R. Morton, and John H. Hamrick developed a 3D hydrodynamic and water quality model in their research and applied it to Tenkiller Lake, Oklahoma (Ji et al., 2004). The research conducted by Mircea Visescu, studied the need and possibilities of sediment transport modeling using an advanced hydroinformatics tool (Visescu et al., 2016). MIKE 11 was used by DHI software, HD, and the ST module for modeling. The sediment movement model and a 3D hydrodynamic model were developed to study sediment movement in the reservoir, according to a study by Xinchen Wang (Wang et al., 2020).

In general, the work focuses on modeling with special emphasis on sediments in water bodies. When we read and analyzed these articles, it became clear that different models were used. Almost 50% of them are articles based on models such as numerical models, mathematical models, hydrodynamic models, and other models (Table 2). In these articles, it is possible to observe the reduction of the useful volume of reservoirs, the movement of sediments in the reservoir, the erosion of its banks, the influence of hydrodynamic forces, and the deterioration of the condition of reservoirs.

Table 2: List of publications based on modeling

No.	Name of models	Count	%
1.	Mathematical models	15	7.3
2.	Numerical models	24	11.7
3.	Hydrodynamic models	42	20.5
4.	Other models	20	9.7
5.	Other topics	104	50.8

The remaining approximately 50% of articles, or remaining 104 articles, are on topics related to problems in reservoirs, such as Effects of sediment on the dynamic pressure, Hydrodynamic changes, Hydrodynamic characteristics and sediment transport, Water Transfer Redistributes Sediment in reservoir, Two-dimensional simulation of reservoir (Du et al., 2001; Bacchiega and Fattor, 2004; Jun et al., 2013; T. Li and Pasternack, 2022; Young et al., 2005).

4. Conclusion

Reservoirs are crucial for supplying water for agricultural purposes and producing energy. Currently, researchers are exploring methods to enhance reservoir capacity, minimize water loss, and continually observe changes in reservoirs influenced by hydrodynamic processes. To date, hydrodynamic processes in reservoirs have been examined through both physical and mathematical modeling. Expanding the domains in specialized research helps to find a general picture of the issues being addressed. Bibliometric analysis of water bodies has been studied by many researchers due to its importance. In this study, keyword analysis and bibliometric analysis methods were used based on a three-stage methodological approach.

In the beginning phase of the study, data was sourced from the Web of Science database using the keywords “Reservoirs”, “Dynamics” and additionally “Sediment”. 205 publications within subject areas like water resources, environmental science, engineering, and agriculture were uploaded between 2000 and 2023. In the middle phase of the study, the data were categorized and analyzed according to various aspects. According to the analysis, 82% of publications are scientific articles, and a positive trend with a correlation of 86% is observed in the publication. The top 10 authors have contributed approximately 20% of the publications. The results indicate that almost half of the top 14 institutions are from China; the Chinese Academy of Sciences” takes first place in the record (15 records). After the analysis by countries, it was established that numerous studies on hydrodynamics and sedimentation processes in reservoirs are being conducted by Chinese scientific organizations and communities. From the analysis of the list of top-cited publications, it was found that in recent years, the study of water bodies through modeling in the context of climate change has become increasingly popular. Water Resources Research is the leading journal for publishing research on reservoir flow dynamics and sedimentation processes. Therefore, the results of the analyses show that 205 papers received 2874 citations in 85 journals. Figure 6 shows the top 10 journals with more than 80 citations from publications between 2000 and 2023. Almost 50% of citations for articles are in the top three journals: Water Resources Research, Journal of Hydrology, and Water Research.

In the final phase, using bibliometric tools, the co-occurrence of authors, co-occurrence keywords, thematic evolution, and interrelationship analysis was done. VOSviewer, the result of keyword analysis, shows that there are 4 of the most relevant keywords, which are sediment and its transportation, reservoir, and dynamic. Thematic evolution and interrelationship analysis also confirm that "sediment," "dynamic," and "reservoir" was key research areas around the world. This indicates that these topics will have remained dominant in the upcoming decade. As a result of studying the articles, it became known that special attention was paid to various models used to study the movement of sediments in reservoirs. Almost 50% of them are articles based on models such as numerical models, mathematical models, hydrodynamic models, and other models.

Acknowledgements

The team of authors would like to express their gratitude to the leadership of the National Research University "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" for organizing the "Bibliometric Research" project and for providing assistance in writing this article within the framework of the project. Special thanks to Zulfiya Kannazarova for her guidance and supervision during the “Bibliometric Research” course.

References

Apriniyadi, Muhamad, Rosmalia Dita Nugraheni, Cahyaningratri Prima Riyandhani, Cahaya Rosyidan, and Yarra Sutadiwiria. 2023. Bibliometric Analysis on Numerical Lithofacies Identification for Reservoir Characterization in the Period of 1980 -2021. PETRO: Jurnal Ilmiah Teknik Perminyakan, 11 (4): Pp. 292–305. https://doi.org/10.25105/petro.v11i4.14424.

Aria, Massimo, and Corrado Cuccurullo. 2017. Bibliometrix : An R-Tool for Comprehensive Science Mapping Analysis. Journal of Informetrics 11 (4): Pp. 959–75. https://doi.org/10.1016/j.joi.2017.08.007.

Bacchiega, JD, and CA Fattor. 2004. Hydrodynamic Changes in the Energy Dissipator Due to the Erosion below Los Quiroga Deviation Dam. Edited by C Hu, Y Tan, Z Zhou, X Shao, and C Liu. Proceedings Of The Ninth International Symposium On River Sedimentation, Vols 1-4. Tsinghua University Haidianqu, Beijing 100084, Peoples R China: Tsinghua University Press.

Busker, Tim, Ad de Roo, Emiliano Gelati, Christian Schwatke, Marko Adamovic, Berny Bisselink, Jean-Francois Pekel, and Andrew Cottam. 2019. A Global Lake and Reservoir Volume Analysis Using a Surface Water Dataset and Satellite Altimetry. Hydrology and Earth System Sciences 23 (2): Pp. 669–90. https://doi.org/10.5194/hess-23-669-2019.

Du, XL, JT Wang, and TK Hung. 2001. Effects of Sediment on the Dynamic Pressure on Rigid Dams. Edited by BF Spencer and YX Hu. Earthquake Engineering Frontiers In The New Millennium. Schipholweg 107c, Po Box 447, 2316 Xc Leiden, Netherlands: A A Balkema Publishers.

Fangling Qin, Ying Zhu, Tianqi Ao, and Ting Chen. 2021. The Development Trend and Research Frontiers of Distributed Hydrological Models—Visual Bibliometric Analysis Based on Citespace. WATER 13 (2): Pp. 174. https://doi.org/10.3390/w13020174.

Gelda, Rakesh K., and Steven W. Effler. 2007. Modeling Turbidity in a Water Supply Reservoir: Advancements and Issues. Journal Of Environmental Engineering-Asce. 1801 Alexander Bell Dr, Reston, Va 20191-4400 Usa: Asce-Amer Soc Civil Engineers. Https://Doi.Org/10.1061/(Asce)0733-9372(2007)133:2(139).

Hood, William, and Wilson Concepcion. 2001. The Literature of Bibliometrics, Scientometrics, and Informetrics. Scientometrics 52 (October): Pp. 291–314. https://doi.org/10.1023/A:1017919924342.

Ikramova, Malika. 2016. Estimation of Sediment Loads: The Tuyamuyun Reservoir on Amudarya River. European Science Review, Pp. 199–202.

Ikramova, Malika. 2021. The Amudarya Flow Management by the Tuyamuyun Hydro Complex. Warsaw: RS Global Sp.z, 78. https://doi.org/10.31435/rsglobal/032.

Ji, ZG, MR Morton, and JH Hamrick. 2004. Modeling Hydrodynamic and Water Quality Processes in a Reservoir. Edited by ML Spaulding. Estuarine And Coastal Modeling, Proceedings. United Engineering Center, 345 E 47th St, New York, Ny 10017-2398 Usa: Amer Soc Civil Engineers.

Jun, Chen, Tang Hong-wu, Xiao Yang, and Ji Min. 2013. Hydrodynamic Characteristics and Sediment Transport of a Tidal River under Influence of Wading Engineering Groups. China Ocean Engineering. International Dept, 8 Da Hui Shi, Beijing 100081, Peoples R China: China Ocean Press. https://doi.org/10.1007/s13344-013-0068-y.

Kai Peng, Jianming Deng, Zhijun Gong, and Boqiang Qin. 2019. Characteristics and Development Trends of Ecohydrology in Lakes and Reservoirs: Insights from Bibliometrics. Ecohydrology 12 (3). https://doi.org/10.1002/eco.2080.

Kannazarova, Zulfiya, Mukhiddin Juliev, Jilili Abuduwaili, Ashirbek Muratov, and Fakhriddin Bekchanov. 2024. Drainage in Irrigated Agriculture: Bibliometric Analysis for the Period of 2017–2021. Agricultural Water Management 305 (October). https://doi.org/10.1016/j.agwat.2024.109118.

Li, Jinzhao, Meilan Qi, and David R. Fuhrman. 2019. Numerical Modeling of Flow and Morphology Induced by a Solitary Wave on a Sloping Beach. Applied Ocean Research 82 (January): Pp. 259–73. https://doi.org/10.1016/j.apor.2018.11.007.

Li, Tingyu, and Gregory B. Pasternack. 2022. Water Transfer Redistributes Sediment in Small Mountain Reservoirs. Water Resources Management. Van Godewijckstraat 30, 3311 Gz Dordrecht, Netherlands: Springer. https://doi.org/10.1007/s11269-022-03290-2.

Long Ho, and ·Peter Goethals. 2020. Research Hotspots and Current

Challenges of Lakes and Reservoirs: A Bibliometric Analysis. Scientometrics 124: Pp. 603–31. https://doi.org/10.1007/s11192-020-03453-1.

Minghong, Chen. 2015. Water Regulation and Water Resources Management Selections for North China : Using Beiyun River Basin as an Example. Edited by S Hongqi and L Xiangxin. Proceeding Of The 5th International Yellow River Forum On Ensuring Water Right Of The River's Demand And Healthy River Basin Maintenance, Vol I. Chengdong Lu, Zhengzhou, Henan 450004, Peoples R China: Yellow River Conservancy Press.

Olsson, Oliver, Melanie Bauer, Malika Ikramova, and Frobebrich Jochen. 2008. The Role of Amudarya Dams and Reservoirs in Future Water Supply in The Amu Darya Basin. Springer: Science and Business Media, January, Pp. 277–92. https://doi.org/10.1007/978-1-4020-8960-2_20.

P.O, Youdeowei, Nwankwoala H.O, and Desai D.D. 2019. Dam Structures And Types In Nigeria: Sustainability And Effectiveness. Water Conservation and Management, January, Pp. 20–26. https://doi.org/10.26480/wcm.01.2019.20.26.

Passas, Ioannis. 2024. Bibliometric Analysis: The Main Steps. Encyclopedia 4 (2): Pp. 1014–25. https://doi.org/10.3390/encyclopedia4020065.

Visescu, Mircea, Erika Beilicci, and Robert Beilicci. 2016. Sediment Transport Modelling with Advanced Hydroinformatic Tool Case Study - Modelling On Bega Channel Sector. Edited by M Drusa, I Yilmaz, M Marschalko, E Coisson, and A Segalini. World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium 2016, Wmcaus 2016. Procedia Engineering. Sara Burgerhartstraat 25, Po Box 211, 1000 Ae Amsterdam, Netherlands: Elsevier Science Bv. https://doi.org/10.1016/j.proeng.2016.08.651.

Wang, Xinchen, Hong Zhang, Edoardo Bertone, Rodney A. Stewart, and Kelvin O'Halloran. 2020. Numerical Study of the Hydrodynamic and Sediment Transport Process in a Subtropical Water Reservoir: The Impacts of Storms and Winds. Environmental Modeling And Assessment. Van Godewijckstraat 30, 3311 Gz Dordrecht, Netherlands: Springer. https://doi.org/10.1007/s10666-020-09719-5.

Warsa, Andri, and Lismining Pujiyani Astuti. 2025. Determination Of Waters Carrying Capacity For Sustainable Aquaculture Management In Jatigede Reservoir, West Java, Indonesia. Water Conservation.

Yang, Siluo, Qingli Yuan, and Jiahui Dong. 2020. Are Scientometrics, Informetrics, and Bibliometrics Different? Data Science and Informetrics 01 (January):23. https://doi.org/10.4236/dsi.2020.11003.

Yang, Xiaojing, Boyang Sun, Sheng Lei, Fapeng Li, and Yanping Qu. 2022. A Bibliometric Analysis and Review of Water Resources Carrying Capacity Using René Descartes's Discourse Theory. Front. Earth Science 10. https://doi.org/10.3389/feart.2022.970582.

Young, DL, QH Lin, and K Murugesan. 2005. Two-Dimensional Simulation of a Thermally Stratified Reservoir with High Sediment-Laden Inflow. Journal Of Hydraulic Research. 2-4 Park Square, Milton Park, Abingdon Or14 4rn, Oxon, England: Taylor And Francis Ltd. https://doi.org/10.1080/00221680509500131.

Yu, Chunxue, Zhihao Xu, Yunying Li, Ying Yang, Yanpeng Cai, and Zhifeng Yang. 2023. Rethinking Environmental Flow Management Strategies in Reservoir Operations from an Integrated Water Quality Perspective. Journal Of Hydrology. Radarweg 29, 1043 Nx Amsterdam, Netherlands: Elsevier. https://doi.org/10.1016/j.jhydrol.2023.130196.

Zhao, Yu, Yongfa Zhang, and Pengfei He. 2023. Hydraulic Fracturing and Rock Mechanics. Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-2540-7.

Zieminska-Stolarska, Aleksandra, Andrzej Polanczyk, and Ireneusz Zbicinski. 2015. 3-D CFD Simulations of Hydrodynamics in the Sulejow Dam Reservoir. Journal Of Hydrology And Hydromechanics. Dubravska Cesta 9, 842 34 Bratislava, Slovakia: Veda, Slovak Acad Sciences. https://doi.org/10.1515/johh-2015-0033.

Ziyang Guo, Dianchang Wang, Lei Zhang, Hai Huang, and Dayu Wang. 2021. Bibliometric Analysis of Research on the Water and Sediment Environment in the Middle Lower Changjiang River Basin. In . Vol. 668. Beijing, China: IOP Conference Series: Earth and Environmental Science. https://doi.org/10.1088/1755-1315/668/1/012047.

Zouabi-Aloui, Besma, Segun Michael Adelana, and Moncef Gueddari. 2015. Effects of Selective Withdrawal on Hydrodynamics and Water Quality of a Thermally Stratified Reservoir in the Southern Side of the Mediterranean Sea: A Simulation Approach."Environmental Monitoring And Assessment. Van Godewijckstraat 30, 3311 Gz Dordrecht, Netherlands: Springer. https://doi.org/10.1007/s10661-015-4509-3.