PRISMA 2020 Checklist

Table S1. PRISMA 2020 checklist.

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	This is identified in the title; Wastewater Treatment and Reuse for Sustainable Water Re-sources Management: A Systematic Literature Review
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	In the abstract It is mentioned that systematic literature review was selected for this study to evaluate and synthesize.
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	In the introduction it is mentioned that most of the current literature has focused on the various techniques of wastewater treatment, touching very little on sustainability. Some of the common wastewater treatment techniques discussed in the previous studies include chemical treatment, physical treatment, the use of biological organisms, and sludge treatment. Previous studies have also explored basic steps in wastewater treatment, including screening and pumping (preliminary treatment), primary treatment, secondary treatment, disinfection, and sludge treatment.
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	In the introduction it is described that the overarching purpose of this study is to evaluate and synthesize the available evidence in support of wastewater treatment for both economic and environmental sustainability.
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	It is mentioned in the section titled 3.2. Source Identification that the Boolean operators played a significant role in limiting the search results to the specific inclusion and exclusion criteria. The snowball sampling includes additional evaluation of the articles and may not meet certain inclusion criteria such as year of publication. Six factors were considered in identifying and selecting the most appropriate articles for further analysis. The first factor to consider was the originality of the article. The second factor to consider was the relationship to the literature or the research topic. The third important issue to consider was the methodology used in collecting and analyzing data. The fourth step involved analyzing the results to ensure they are analyzed properly, and conclusions connect to various parts of the paper. The fifth step examined the implications of the findings on

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			the research, practice, and society. The final step examined the general quality of the communication.
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	It is mentioned in the section titled 3.2. Source Identification that in the case of wastewater treatment and sustainability, the databases included Resources, Conservation and Recycling, Sustainability, Nature, Waste Management, and Journal of Industrial Ecology. The basic inclusion criteria included the year of publication (2000-2023). Each source was last searched or consulted on May 25, 2023.
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	It is mentioned in the section titled 3.2. Source Identification that there two methods used in the second step, after formulating questions, included search using “the Web” and “Boolean Operators”. The web search involved the use of keywords to identify and retrieve articles that are related to the research question and qualitative variables. The keywords included wastewater treatment, sustainability, and water management. The keywords were used in combination to enhance the accuracy of the outcomes. For instance, “wastewater treatment” and “sustainable management” were used in combination to obtain articles that examined the relationship between wastewater treatment and its role in sustainable water management. The purpose of using the keywords was to enhance the accuracy of the articles. The Boolean operators’ approach was also used to combine search terms in ways that broaden and limits the search results. For instance, if the keywords “wastewater treatment” are used in the search for articles, it broadens the search by returning nearly all the articles regarding wastewater treatment. However, the use of combined keywords such as “wastewater treatment and sustainability” limits the search results by returning mostly articles focusing on sustainability. The Boolean Operators were also useful in getting more articles using a method known as snowballing sampling. Snowballing sampling is used when the identified results do not provide direct answers to the research questions. The snowball sampling includes additional evaluation of the articles and may not meet certain inclusion criteria such as year of publication. The snowball sampling helped in expanding the number of articles used in the research and adding strength to the evidence.
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review,	It is mentioned in the section titled 3.3. Selecting and

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		including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Evaluating Sources that the article selection occurred in two main phases beginning with the abstract screening. The second phase examined if the articles met the inclusion criteria. The basic inclusion criteria included the year of publication (2000-2023), wastewater treatment, sustainable water management, journal, book, and authoritative website. The inclusion criteria also included an examination of whether the articles are biased regarding funding or affiliation.
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	It is mentioned in the section titled 3.2. Source Identification that the third important issue to consider was the methodology used in collecting and analyzing data. Crucial factors to consider included the research design, sampling procedures, data collection instruments, and methods used in analyzing the outcomes. It was also crucial for the researcher to determine if the equivalent work on which the paper is based is well-designed and backed with sufficient evidence. The collection of information was performed manually by the researcher, analyzing the identified literature.
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	It is mentioned in the section titled 3.3. Selecting and Evaluating Sources that the total number of articles obtained from manual research was 350. However, not all these articles were eligible for the study. Most of them did not meet the year of publication requirements which limited the articles to a period between 2000 and 2023. More than 250 articles were rejected for being duplicates, ineligible, or removed for other reasons such as the year of publication. The remaining 100 articles were further subjected to further evaluation to identify the ones with specific answers to the research question. A total of 46 articles met the final criteria and were selected based on their relevancy and accuracy in answering the research question.
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	It is mentioned in the section titled 3.3. Selecting and Evaluating Sources that the remaining 68 articles were included in the references list to add more perspective to the arguments made in this paper, considering that a total of 114 references were used.
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	It is implied in the section titled 3.3. Selecting and Evaluating Sources that the researcher determined if the equivalent work on which the paper is based is well-designed and backed with sufficient evidence. Also, it is mentioned in the section titled 4. Results that the results

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			were ranked based on strength, content validity, bias, and application to wastewater treatment and sustainable resource management.
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	The effects are positive because it is mentioned in the section titled 4. Results that the application of PRISMA helped in narrowing the results to identify the most accurate articles the provide answers to the research question. The research also evaluated evidence to enhance validity and reliability.
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Using the criteria mentioned above and classifying the findings according to the topics covered in the systematic review of the literature. Part of the eligible results can be seen in Figure 4. PRISMA flowchart.
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	No statistical methods or data conversations were used, the methodology used is presented in the previous sections of this format in the methods section.
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	The PRISMA method was used, and the flowchart was placed as a figure (Figure 4. PRISMA flowchart), according to the criteria used in this methods section.
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Not applicable.
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Not applicable.
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Not applicable.
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	It is implied in the section titled 4. Results that the results were ranked qualitatively based on strength, content validity, bias, and application to wastewater treatment and sustainable resource management.
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	It is mentioned in the section titled 3. Methods that in this research, a narrative approach was used to analyze the results obtained from the previous studies. Both the narrative and quantitative approaches are acceptable routes for analyzing and drawing logical conclusions from the available data.
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	The summary of the findings is shown in Table 1.
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	It is mentioned in the section titled “Selecting and Evaluating Sources” that the remaining 68 articles were included in the references list to add more perspective to the arguments made in this paper.

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Study characteristics	17	Cite each included study and present its characteristics.	The summary of the findings is shown in Table 1.
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	This was considered in Method section. Also, it is mentioned in the section titled 4. Results that the results were also ranked based on strength, content validity, bias, and application to wastewater treatment and sustainable resource management.
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Not applicable.
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	This was considered in Method section. Also, it is mentioned in the section titled 4. Results that the results were also ranked based on strength, content validity, bias, and application to wastewater treatment and sustainable resource management.
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Not applicable.
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	It is implied in Figure 4 and Table 1.
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	It is implied in Figure 4 and Table 1.
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	This was considered in Method section. Also, it is mentioned in the section titled 4. Results that the results were also ranked based on strength, content validity, bias, and application to wastewater treatment and sustainable resource management.
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	This was considered in Method section. Also, it is mentioned in the section titled 4. Results that the results were also ranked based on strength, content validity, bias, and application to wastewater treatment and sustainable resource management.
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	It was considered in this section.
	23b	Discuss any limitations of the evidence included in the review.	This is inferred in the section due to the method used.
	23c	Discuss any limitations of the review processes used.	This is inferred in the section due to the method used.
	23d	Discuss implications of the results for practice, policy, and future research.	It was considered because in Methods it is mentioned in the section titled 3.2. Source Identification that the researcher also examined if the results were properly interpreted to explain their implications on the issue under investigation. Papers that qualified for review fully satisfied both the analysis and conclusion criteria. The papers were also based on the recent findings, within the last five



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			years, to reflect current trends in the market. The fifth step examined the implications of the findings on the research, practice, and society.
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Not applicable.
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Not applicable.
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Not applicable.
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	This research received no external funding.
Competing interests	26	Declare any competing interests of review authors.	The author declares no conflict of interest.
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Not applicable.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

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