REVIEW ARTICLE

FACTORS ASSOCIATED WITH DEMAND FOR TREATED WATER: A SYSTEMATIC REVIEW

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ABSTRACT

Water demand can be classified into domestic demand and non-domestic demand. Globally, water demand modelling for forecasting and projection has become a popular subject for study in recent years. Studies of water demand aid the water utilities agency and municipal planning in guaranteeing financial, socioecological, and social sustainability. This systematic review aims to present and systematically determine the factors associated with the demand for treated water. Articles related to factors associated with demand for treated water were collected electronically from two different databases, namely Ebscohost (116) and Scopus (250). Two pairs of independent reviewers screened the titles and abstracts of the collected data, stored in Microsoft Excel, against the inclusion and exclusion criteria. Afterwards, the included articles were critically appraised to assess the quality of the studies using the Mixed Method Appraisal Tool (MMAT). Of the 366 articles identified, nine were included in the final review. The demand of treated water is affected by (i) Socioeconomic factors, (ii) Structural factors, (iii) Water supply factors, and (iv) Climate/ Geographical factors. The supply of treated water is becoming increasingly limited, due to variuos issues. Therefore, understanding the factors influencing the demand for treated water is critical. The findings from all the related studies may be utilized to improve the implementation of treated water solution programmes, which would help to maximize the successful implementation of demand for treated water programmes.

Keywords: *Treated water demand, domestic, non-domestic, factors, and determinants*

INTRODUCTION

Water demand encompasses the volume of water necessary for fulfilling the requirements of individuals, communities, industries, or ecosystems across various activities. It quantifies the amount of water needed within a specific timeframe to cater to specific populations or purposes. Water demand can be classified into domestic demand and non-domestic demand. Domestic water demand includes indoor and outdoor usage activities such as drinking, meal preparation, bathing, washing clothes and dishes, as well as watering the garden and yard. Meanwhile non-domestic water usage includes industrial, agriculture, commercial and public uses of water such as that required by offices, schools and hospitals[1,2]. According to the 2016 Malaysia Water Industry Guide, the volume and percentage of water used for domestic consumption increased by approximately 1.85% from 6,378 million litres per day (mld) in 2015 to 6,495 mld in 2016. Meanwhile, non-domestic water usage increased by 4% between 2015 and 2016, from 4,074 mld to 4,242 mld[2,3]. The National Water Resource Study 2000-2050 predicted a 63% rise in water consumption between the years 2000 and 2050. In particular, it is anticipated that the volume of domestic water demand will quadruple from 2,029 million m3 to 5,904 million m3[2,3].

Globally, water demand modelling for forecasting and projection has become a popular topic of study in recent years. Studies of water demand aid the water utilities agency and municipal planning in guaranteeing financial, socioecological, and social sustainability[4-6]. Urbanization has been one of the driving forces behind the rising water demand. The rapid migration of individuals seeking better prospects as a result of urbanisation leads to an increase in the population density and, consequently, the water demand. Rapid increase in population exceeding available water resources might result in water scarcity[7]. Water demand modelling for forecasting and projection of water consumption can be done at micro and macro level. The micro level focuses on water demand predictors at the household level, while the macro level focuses on water demand predictors at the district, state, and national levels[8]. Several variables, including population density, household density, household income, built-up area, and property density,

might influence water demand[9]. In addition, the water supplies may be changed naturally by climate change and human density shifts[10]. Thus, the purpose of this article is to present and systematically analyse the factors associated with the treated water demand.

The complexities surrounding the demand for treated water highlight the necessity for in-depth exploration through systematic review. The increasing pressure on water treatment facilities and infrastructure, along with potential environmental impacts, suggests a need for comprehensive understanding. Additionally, the financial implications of meeting rising demands underscore the importance of further investigation into this multifaceted issue.

METHODS

This systematic review is prepared in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analyses) updated guidelines. The objective of this review is to identify the factors associated with demand for treated water. The components of mnemonic PEO (population, exposure, outcome) were established as follows:

- Population: general or public population
- Exposure: population density, household income, built-up area, property density, climate change
- Outcome: treated water demand

Searching Strategy

The literature search was conducted from 1st November 2022 to 30th November 2022, using Ebscohost and Scopus databases. The articles are chosen from academic journals. The following are keywords used for searching related articles: "factors" OR "determinants" AND “"domestic water" OR "household water" OR "residential water" AND "demand" OR "consumption" OR "usage". Deduplication was implemented in the search engine. Remaining articles were retrieved and imported into Microsoft Excel.

Eligibility Criteria

The inclusion criteria were: (1) publication in the English language; and (2) original articles including cross-sectional, case control and experimental field studies investigating the associated factors for treated water demand. In contrast, mixed methods and qualitative studies as well as non-original articles such as conference proceedings, perspectives, commentaries, opinion, reports, systemic review, and meta-analyses were excluded. It was decided that the publication period was to be from year 2000 onwards.

Study Selection

Two pairs of independent reviewers screened the titles and abstracts of the retrieved materials against both the inclusion and exclusion criteria. The potential articles identified during the main screening were kept, and the full texts were reviewed carefully and independently by the same reviewers according to the inclusion and exclusion criteria. The third reviewer was assigned to resolve any disagreements that arose between each pair of reviewers.

Critical Appraisal and Data Extraction

Quality appraisal was conducted using the Mixed Method Appraisal Tool (MMAT). The MMAT evaluates the quality of articles. It focuses on methodological criteria and includes five core quality criteria for each of the selected articles[11]. One reviewer extracted the data, which were then assessed independently by the second reviewer. Eligible articles were analyzed in detail using the content analysis method without performing any statistical tests.

RESULTS

The search yielded 116 articles from Ebscohost, and 250 articles from SCOPUS, resulting in 366 unique hits. Only nine articles were included in the full-text assessment after rigorous selection screening, as shown in the PRISMA flow diagram (Figure 1). A descriptive summary of the studies included in this review regarding study location and design is presented in Table 1. The findings from nine studies were included in this systematic review, as shown in Table 2. Two eligible articles were from India, one from Nigeria, one from Nepal, and one each from Ethiopia, Philippines, and Barcelona. The analyzed articles were published between 2017 and 2022. All nine articles were cross-sectional studies.

Table 1. Summary of study location and study design.

Authors	Study Location	Study Design
Oyerinde & Jacobs 2021[12]	Nigeria	Cross-sectional
Ito et al., 2021[13]	Nepal.	Cross-sectional
Kumar & Ramachandran 2019[9]	India	Cross-sectional
Timotewos et al., 2022[14]	Ethiopia	cross-sectional ecologic studies
Singh et al., 2017[15]	India	Cross-sectional
Palanca-Tan R. 2020[16]	Philippines	Cross-sectional
March et al. 2012[17]	Barcelona	Cross-sectional
Almulhim & Aina 2021[18]	Saudi Arabia	Cross-sectional
Bich-Ngoc et al., 2022[19]	Belgium	Cross-sectional

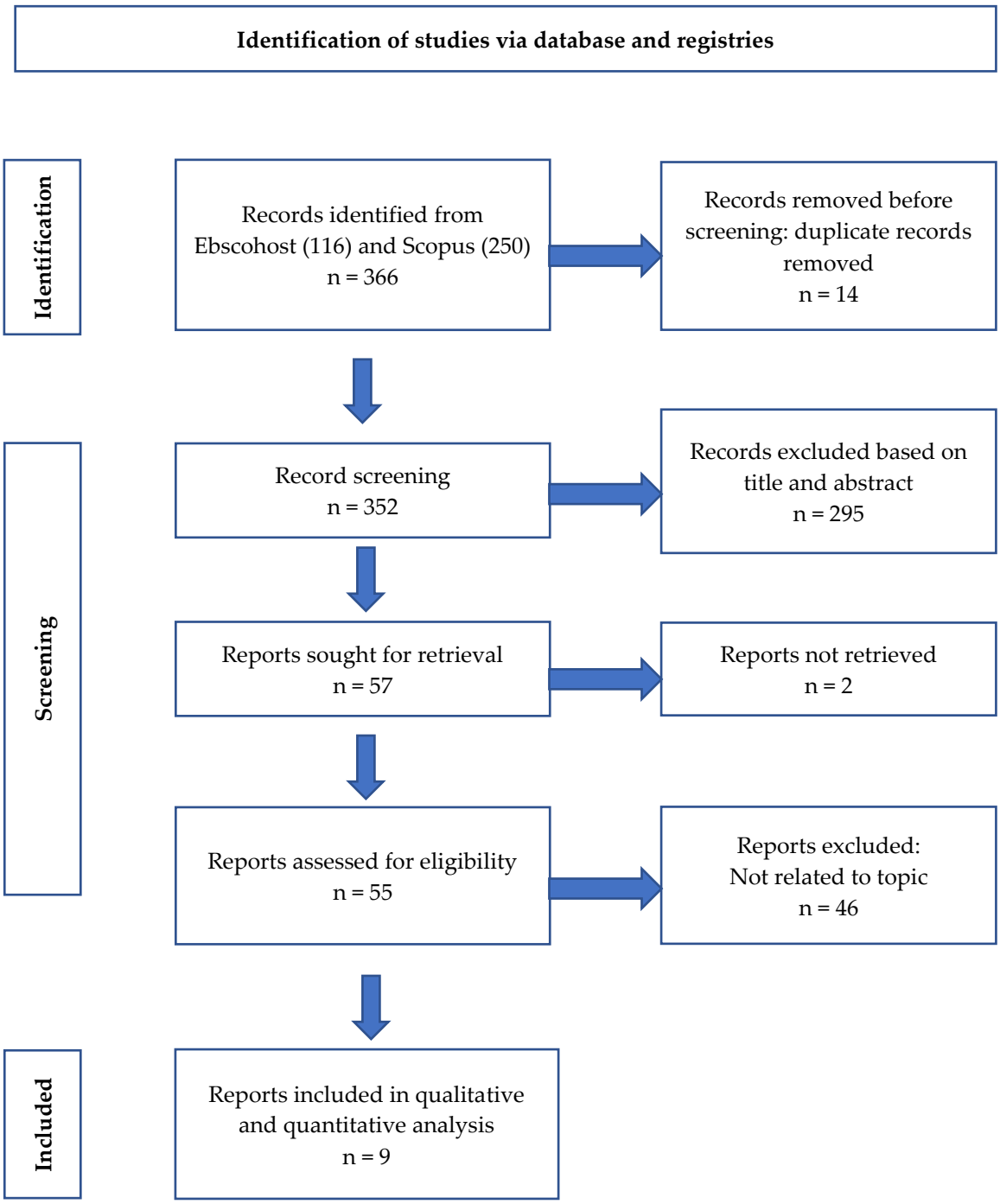

Figure 1. PRISMA flow diagram for the systematic review

Table 2. Summary of accepted articles.

Author (Year)	Title	Study Design	Sample Size	Population	Exposure	Outcome review
Oyerinde & Jacobs (2021)[12]	Determinants of household water demand: a cross-sectional study in South West Nigeria	Cross-sectional study	1,300	Population at the South West region of Nigeria -Ibadan (Oyo State), Abeokuta, Mowe, Ibafo, Arepo, Ijebu Ode, Sagamu, Ifo, Sango Ota, Agbado (Ogun State), Isolo, Oshodi and Ajegunle (Lagos State).	1. Access to water within the premise 2. Household size 3. Presence of in-house storage 4. Household monthly income 5. Payment for water 6. Educational qualification 7. Building/house type 8. Trip number 9. Trip time: time spent on water collection	1. 71% of the households have water within their premises with r = 0.402, p < 0.05. 2. An increase in household size caused a similar increase in domestic water consumption, while per capita water demand decreases with an increase in household size. r = 0.167, p < 0.05 3. On-site storage is significant and positively correlated with water consumption, r = 0.056, P < 0.05 4. Household monthly income positively correlated with water consumption, r = 0.093, p< 0.05. Most studies agree that an increase in household income is usually accompanied by an increase in water consumption 5. Payment for water was significant and negatively correlated with water consumption, r = -0.086, p< 0.05. 6. Educational qualification : associated with choice of water source, housing type especially modern apartment and lifestyle. r= 0.061, p < 0.05 7. Building/house type : A house uses more water compared to an apartment at r = 0.052, P , 0.05. 8. The number of round trips to collect water from a remote source is a significant determinant of residential water consumption among households with off-site water sources. , r= 0.253, p < 0.05 9. Time spent on water collection is negatively correlated with household water consumption. r = - 0.061, p < 0.05.
Ito et al., 2021[13]	Physical and non-physical factors associated with water consumption	Cross-sectional study	992	Households in Kathmandu valley: Kathmandhu district and Lalitpur district	Physical 1. source 2. supply time 3. earthquake	1. The mean water consumption increased with the number of water sources 2. Between households using groundwater and those using tanker water, although

Author (Year)	Title	Study Design	Sample Size	Population	Exposure	Outcome review
	at the household level in a region using multiple water sources				4. season Non-physical 1. wealth 2. head education 3. ownership 4. water treatment	there was no difference in Phase 1, those using tanker water consumed more water in Phase 2 ($p < 0.01$), while those using groundwater consumed more water in Phase 3 ($p < 0.01$). 3. Total water consumption significantly decreased after the earthquake ($p < 0.01$) 4. Total water consumption recovered in the wet season ($p < 0.01$). 5. Households with higher wealth status consumed more water, however these associations were not statistically significant after the earthquake. 6. Households with higher education for household head consumed more water 7. Households using treated water consumed less water
Kumar & Ramachandran 2019[9]	Cross-sectional study of factors influencing the residential water demand in Bangalore	Cross-sectional study	198	Municipal wards of Bangalore city	Demographic: 1. Population density 2. Households density 3. Household income Infrastructural: 1. Built-up area per property 2. Properties per ward area 3. Road density 4. Street light density 5. Per capita park area	1. There is a negative correlation (−0.34) between population density and average monthly water consumption. 2. Average number of members per household in ward has a positive influence on the average water consumption in the linear models. $R2 = 0.021$ 3. Proportion of high income households positively influence the average ward level water demand, $R2 = 0.330$, $p = 0.025$ 4. Average built-up area has a positive linear association (0.48) with an average consumption.

Author (Year)	Title	Study Design	Sample Size	Population	Exposure	Outcome review
Timotewos et al., 2022[14]	The Assessment of Climate Variables and Geographical Distribution on Residential Drinking Water Demand in Ethiopia.	cross-sectional ecologic studies	-	Populations in the three urban towns of Ethiopia: Arba Minch, Ziway,and Debre Birhan.	Climatic data 1. rainfall 2. mean temperature 3. relative humidity Water Consumption Data from nine years (2012–2020) of monthly water consumption	1. Significant relationship between mean temperature ($p<0.05$) and residential water demand 2. Relative humidity has ($t = -3.51$, $p = 0.001$) a significant relationship with the residential water demand.
Singh et al., 2017[15]	Analysis of domestic water demand variables of a residential colony in Ajmer, Rajasthan (India)	Cross-sectional study	112	5 urban colonies of Ajmer City	1. Monthly mean temperature (T) 2. Rainfall (RF) 3. Family size (number of persons) 4. Family income (FI) 5. No of bathrooms (NB)	1. Daily mean temperature of the region correlates with water concumption $r= 0.89$ (p value = 0.01). 2. Demand is greater in the summer, less in the winter. 3. Demand is less when rainfall occurs, because on a rainy day, the temperature falls and humidity rises, so persons may take fewer baths or use the cooler less (p value = 0.01) 4. Water demand is highly dependent on family size (p value = 0.01) 5. The higher a family's income, the greater its demand for water because higher-income families have more water-using appliances in their houses (p value = 0.01. 6. Water demand increases with the number of bathrooms (p value = 0.01)
Palanca-Tan R. 2020[16]	Estimating Residential Water Demand in a Relocation Area with Inadequate Piped Water System	Cross-sectional	50 households	Pandi Residences 2 (Pandi 2)	1. Effective price of water 2. Household size 3. Dummy for public deep well system	4. The demand for water is lower when the price of water is higher (p value = 0.040) 5. Household size has a statistically significant positive impact on water demand – an additional member in the household increases its monthly water consumption by 0.5265 m3 (p value = 0.025) 6. The public deep well system has a statistically significant on water demand. Its coefficient indicates that demand for water from the public deep well system

Author (Year)	Title	Study Design	Sample Size	Population	Exposure	Outcome review
						would be about 9.75 m3 lower than the demand for piped water.
March et al. 2012[17]	Exploring the Links between Immigration, Ageing and Domestic Water Consumption: The Case of the Metropolitan Area of Barcelona	Cross-sectional			1. Immigrants from developing countries 2. Immigrants from developed countries 3. People above 64 years of age	Factors associated with increase treated water demand 1. Socioeconomic factors • People above 64 years old, adjusted beta coefficient, –0.013 2. Population: • Immigrants from developing countries (%) –0.017 • Immigrants from developed countries (%) –0.015
Almulhim & Aina 2021[18]	Understanding Household Water-Use Behavior and Consumption Patterns during COVID-19 Lockdown in Saudi Arabia	Cross-sectional	-	Dammam, Khobar and Dhahran	1. High education (p = 0.037) 2. Work organization (unemployed) (p < 0.01) 3. High total family income (p < 0.01) 4. Residence type (big house) (p=0.001)	Water-use behaviour based on household water consumption
Bich-Ngoc et al., 2022[19]	Factors influencing residential water consumption in Wallonia, Belgium	Cross-sectional			1. Income 2. Rainwater 3. Living area 4. Presence of bathtub, garden, and pool. 5. Built-up density	Increased water demand was associated with: 1. Higher income (p = 0.0348) 2. Presence of bathtub (p = 0.002), garden (p = 0.0047), and pool (p<0.001). 3. Increased living area unit ((p=0.0034) Reduced piped water demand was associated with rainwater use for indoor and outdoor activities (p<0.001) and high density area (p = 0.0056).

Demand for treated water

In this article, nine studies focused on demand for treated water. Factors that are associated with treated water demand are divided into i) socioeconomic factors, ii) structural factors, iii) water supply factors, and iv) climate/ geographical factors. Most of the studies included in this review show an effect on demand for treated water.

Factors Associated with demand for treated water

Sociodemographic factors

A study on demand for treated water in Nigeria found that high household monthly income has positively influenced the average level water demand, r = 0.093, p< 0.05[12]. Similar findings are also found in a study conducted in India[9,15]. In terms of education level, a study in Saudi Arabia found that high education was significantly associated with demand for treated water (p=0.037)[18]. In terms of age, a study in Barcelona found that people above 64 years old have increased demand for treated water[17]. According to a study in Nigeria, an increase in household size caused an increase in domestic water consumption (p<0.05)[12]. Similar findings were noted in a study conducted in India[9,15].

Structural factors

For residence type, a study in Saudi Arabia showed that big houses were significantly associated with demand for treated water (p=0.001)[18]. In addition, water demand also increases with the increased number of bathrooms (p=0.01) as mentioned in the study conducted in India[15]. The presence of bathtub (p=0.002), the presence of garden (p=0.0047) and the presence of pool (p<0.001) also have significant influence on water demand as found in a study conducted in Belgium[19].

Water supply factors

A study in Philippines found that the higher the price of water, the lower the demand for treated water (p= 0.040)[16]. This is also supported by a study in Nigeria that found the payment for water to be significantly and negatively correlated with water consumption, r = -0.086, p<0.05[12].

Geographical/ Climate factors

According to a study in Ethiopia, there is a significant relationship between mean temperature (p<0.05) and residential water demand[14]. Relative humidity also has a significant relationship with the residential water demand (t=-3.5, p=0.001)[14].

Risk of Bias

The authors conducted quality appraisal of all nine studies using the Mixed Method Appraisal Tool (MMAT). The methodology quality of qualitative studies can be appraised using this tool. Five criteria are used to assess the quality of the studies[11]. The details of this assessment for the selected studies selected are set out in Table 3.

Table 3. The details of the MMAT assessment.

Author	Type of Study	1.1 Is the sampling strategy relevant to address the research question?	1.2 Is the sample representative of the target population?	1.3 Are the measurements appropriate?	1.4 Is the risk of nonresponse bias low?	1.5 Is the statistical analysis appropriate to answer the research question?
Oyerinde & Jacobs 2021[12]	Quantitative descriptive	yes	yes	yes	yes	yes
Ito et al., 2021[13]	Quantitative descriptive	yes	yes	yes	yes	yes
Kumar & Ramachandran 2019[9]	Quantitative descriptive	yes	yes	yes	yes	yes
Timotewos et al., 2022[14]	Quantitative descriptive	yes	yes	yes	yes	yes
Singh et al., 2017[15]	Quantitative descriptive	yes	yes	yes	yes	yes
Palanca-Tan R. 2020[16]	Quantitative descriptive	yes	yes	yes	yes	yes
March et al. 2012[17]	Quantitative descriptive	yes	yes	yes	yes	yes
Almulhim & Aina 2021[18]	Quantitative descriptive	yes	yes	yes	yes	yes
Bich-Ngoc et al., 2022[19]	Quantitative descriptive	yes	yes	yes	yes	yes

DISCUSSION

A few factors were found to have contributed to the treated water demand. They were classified into four categories: (i) Socioeconomic factors, (ii) Structural factors, (iii) Water supply factors, and (iv) Climate/ Geographical factors

Sociodemographic factors

Similar to the findings of this study, a case study in Nepal reported that households with low-income tend to consume less water[20]. In addition, according to previous reports in Nepal, households with highly educated head members have higher coping costs and owners pay more to get water from alternative sources, although tenants would compromise their water consumption[21,22]. Wealth status, educated household heads and ownership may have helped improve coping strategies and increase water consumption. Those with high income levels and households with high water consumption suggest that they have the capacity to pay more. The higher a family's income, the greater its demand for water[23]. Moreover, higher-income families have more water-using appliances in their houses, such as washing machines, water purifiers, more faucets, bathtubs, etc. Existing literature on water demand frequently explains how money affects the amount of water consumed due to the direct effect of lifestyle and indirectly caused by the presence of dishwashers, gardens, and permanent pools[24]. In addition, lack of awareness on water saving behaviour among those in high income families also contributes to high demand of water consumption[18]. On the other hand, individual factors such as gender, job and educational level are found to influence water use of single-member households and these variables do not necessarily represent the characteristics of the whole family in larger households[25].

Meanwhile, a study done in india suggests that the mean water consumption decreases with an increasing number of members per household in the ward, because the average number of household members is bigger in poor households compared to the rich households[9]. In addition, household size also has a significant positive impact on water demand whereby an additional member in the household would increase the household's monthly water consumption[16].

According to a previous study done in Barcelona, ageing is a factor contributing to lower water consumption per capita which contributes to attitudes more prone to conservation, smaller incomes, and the concentration of this age group in the areas of denser urbanism[17]. Other study reported that an individual's lifestyle can affect water consumption depending on job type, as well as hobbies where people change their clothes more often according to their social role[26]. The elderly may not have developed such lifestyles and therefore, this could result in differences in terms of water use.

Structural factors

The present study also encouraged developmental policies geared at apartment buildings rather than standalone houses – since it is techno-economically more feasible to extend water facilities to apartments than standalone houses[12]. Governments could sustain an increased investment in building, equipping and funding water facilities in order to reduce the supply–demand gap and improve water service delivery[12]. In terms of physical factors, strengthening the diversity of water sources in both baseline and emergency periods is essential. As stated by case study in Nepal, regulation of groundwater development and augmentation of recharge are important[27]. In addition, road maintenance and improvement can help make the distribution of tanker water more efficient, even during emergency periods.The congested wards with a higher number of properties per road length end up with lower than average water demand due to the presence of low income households in the congested wards, and vice-versa[27].

The demand for water from the public deep well system is lower than the demand for piped water which reflects the inconveniences and the high time cost of fetching water from the public deep wells[16]. It is noted that even households residing just a few meters away from the public deep wells buy water from jetmatic pump wells or water tankers[16].

In the literature on water demand, residential characteristics, such as the year of construction, total living space, and the number of rooms, have strong predictive power and are naturally correlated with demand for water consumption[28,29]. Every additional unit of living area will increase water consumption, when keeping other factors such as household size unchanged. The presence of (a) bathtub(s), garden(s), and pool(s) also induce a significant increase in water consumption[16].

Water Supply factors

Demand is always associated with supply and this applies to many situations including in treated water demand, where water supply factors such as quantity of water affected by climate changes, water pricing, inadequate planning and management of authority, insufficient operation of water and distribution system include lack of technology, water pollution, drought conditions, all can affect water demand and consumption[20]. According to a study in Nigeria, a large variation in water consumption was noted between households that have access to water within their premises and those without access[12]. Water sources that are easily accessible to the people are often the most expensive per unit of water . Improved provision of standalone public taps and

subsidised tanker waters could improve this imbalance[12].

Apart from that, the use of additional or alternative water sources other than piped water sources was associated with greater water consumption, especially in households using both groundwater and tanker water due to the water supply being available in larger amounts at one time compared to piped water, thus total water consumption is found to be increased in households with shorter supply times[13]. However, the diversity and greater number of water sources is essential and necessary especially for disaster resilience and water security[31]. In other perspective, the use of rainwater as water source or supply for the purpose of indoor and/or outdoor activities causes a significant reduction in the piped water consumption of the households[32,33]. Besides , households' use of either treated water or unimproved water sources were associated with several reasons such as household income, distance of access to safe and adequate water sources, availability of alternative sources, quality of water source, adequacy, waiting for time, interest, and other cases[15].

Geographical and Climate factors

A few studies have found that climate has a significant impact on treated water consumption and it is related to geographical area. For example, study in Qatar found that the climate factor of temperature has a significant influence on the urban water demand[34]. In a different geographical area like China, the residential water consumption is increasing due to the humid-hot climate of southern cities[35]. The demand for treated water is related to lower temperature and some studies found that increased humidity on rainy days also influences people's consumption of treated water, for example they take fewer baths or use the cooler less, whereas the frequency of taking showers increases in hotter climates[14,15].

The influence of climate variables such as mean temperature, relative humidity, and precipitation on water consumption was also found to be different between the seasonal country and non-seasonal country, aside from the different geographical and altitude characteristics in the country itself. Relative humidity increases with altitude in the atmospheric boundary layer, thus temperature will be low and this influences water consumption.In general, Bio Intelligence states that the availability of freshwater resources will be affected as the Earth's climate changes[14].

Recommendations

Water policies need to take into consideration the structural background which includes population change, immigration, the expansion of low-density city, and the ageing population. The policies expected to have fairer results will be those taking into account these structural conditions and the different water consumption habits that follow. Policy makers can play a role to aid the deployment of smart water management technologies as part of the smart city initiatives[36].

The plan to increase water prices for all households might not be very fair for every population, especially to those who are already very frugal in their water usage. Reduction of water consumption should be more focused towards the community who consumes more water based on their monthly usage. Besides that, the creation and implementation of awareness programmes on water saving behaviours, especially among those in high income families, need to be implemented in order for this group of people to be more aware about conserving water[18].

Demand for water is greater in the summer compared to winter, and the impact of temperature can be overcome by providing green building concepts and using recycled water outdoors. Furthermore, various adaptation or mitigation plans for climate change, such as creating bodies of water and increasing green cover in urban areas for heat absorption, and solar passive architecture that control indoor temperature during the summer, can reduce household water demand[15].

Limitation

As with any research, this systematic review is not without limitations. The role of publication bias in this systematic review must be acknowledged, as grey literature was not included and this systematic review only included studies which were carried out within the years 2000 to 2022. Language bias should also be considered as we only included articles published in English, although our search strategy resulted in literature sourced from several countries where English is not the primary language. Despite these limitations, this systematic review synthesises research evidence regarding the factors associated with the demand for treated water, which may serve as a guide to improving service delivery strategies of the treated water programme.

Future research could set out to collect data over a relatively longer duration of time and to other regions to expand on this work. The demand for treated water also depends on the climate during the study. There could be information bias due to certain types of climate such as dry years which might have influenced the behaviours of certain groups of people. There are many households that still use private water sources such as from the wells but have no pipe connections. Therefore, the data regarding their water consumption were unavailable for further analysis.

CONCLUSION

The demand of treated water is affected by (i) Socioeconomic factors, (ii) Structural factors, (iii) Water supply factors, and (iv) Climate/ Geographical factors. The supply of treated water is becoming increasingly limited, due to variuos issues. Therefore, understanding the factors influencing the demand for treated water is critical. The findings from all the related studies may be utilized to improve the implementation of treated water solution programmes, which would help to maximize the successful implementation of demand for treated water programmes.

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Data Availability Statement
The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest
The authors declare no conflict of interest.

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