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“Strategies for Increasing Sustainable Design Practices and the Sustainability of Residential Buildings in the KSA: A Critical literature Review”

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Abstract:

Sustainable housing is a priority in the Kingdom of Saudi Arabia (KSA), particularly in view of shortages in residential housing, as well as other geographic and economic factors that have contributed to increased annual levels of energy consumption in residential buildings. Therefore, the purpose of this critical literature review was to examine acceptance of sustainable buildings in the general public in the KSA, to identify strategies for increasing the sustainability of residential buildings in the KSA, and to evaluate the role of government regulations in promoting sustainable design practices in the Saudi residential sector. 10 relevant studies were identified after implementing a transparent, comprehensive, and robust search strategy, including 6 studies based in the KSA, 1 from the UK, 1 from Italy, and 2 focused on an international setting. The results indicate that, at present, the KSA is facing a residential housing crisis, and multiple complex barriers exist towards the adoption of sustainable housing practices. Acceptance of sustainable buildings is low among key stakeholders, but the KSA is positioned to begin increasing the use of novel strategies, including smart technologies, regulatory reform, and collaborative efforts from all stakeholders, to address the situation.

Key words: Sustainability, Housing, Saudi Arabia

1. Introduction

Governments and international organisations around the world are increasingly recognising the financial and environmental benefits that flow from the widespread use of sustainable homes. Additionally, researchers have long been interested in the concept and principles of sustainable development (Mensah and Casadevall, 2019). In this field, a key area of study has been sustainability in urban housing and residential buildings, particularly against the backdrop of rapid economic development, urbanisation, changing lifestyles, new trends in public health, and population growth in many countries over the last century (Torres et al., 2019).

In the Kingdom of Saudi Arabia (KSA), trends such as industrialisation, globalisation, and changing migration control policies in recent years have added significant pressure to the country's ability to cater to the growing population's basic needs. In fact, the country has been referred to as suffering from "sustainable housing limitations" (Al Surf et al., 2013, p.251). This is a matter of concern for several reasons. For example, evidence suggests that government policies such as Saudisation and the Nitaqat system, which seek to lower reliance on expatriate workers by replacing them with Saudi nationals, have increased rural-urban migration (Azhar et al., 2016). As a result, estimates indicate that around 60% of the KSA's population currently lives in large cities, and this high level of urbanisation will continue to grow (Salam et al., 2014). Therefore, a sizeable social burden results from the increased demand for housing, electricity, sewage, water, and other utilities, all of which must be delivered in a sustainable way in order to address the mounting threats of climate change, environmental pollution, and diminishing quality of life.

Motivated by the growing body of literature that focuses on the sustainability of residential buildings in the KSA and, more generally, the available strategies for promoting sustainable design practices in localised and effective ways, a critical literature review (CLR) was conducted to synthesise evidence and draw KSA-specific recommendations from a set of recently published studies. Based on a preliminary analysis of the research context, three research questions (RQs) were chosen, addressing the topics of (i) acceptance of sustainable buildings in the KSA's general public; (ii) measures for increasing sustainability of residential buildings in KSA; and (iii) the role of government regulations in KSA for sustainable design in residential sector. The included articles (n = 10) were identified using a robust and transparent search strategy, and data were extracted from each to address the RQs.

2. Background

In addition to providing general contextual information about the trends and history of sustainable housing in the KSA, this section describes (i) barriers and enablers to sustainable housing in the KSA; (ii) the state of sustainable housing in the KSA; and (iii) the technology acceptance model (TAM), which is a theoretical model that is relevant to the promotion of sustainable design and sustainable housing.

2.1 Sustainable Housing and Sustainable Design

With the 2015 adoption of the United Nations' (UN) 2030 Agenda for Sustainable Development, as well as the 17 Sustainable Development Goals (SDGs), the topic of sustainable development, which has long been studied in the peer-reviewed literature, has become increasingly prominent in recent years (Smets and van Lindert, 2016). Today, the concept of sustainable development is generally viewed from the standpoint of Elkington's (1997) triple bottom line (TBL) criteria, which suggests that development is sustainable when it satisfies the "three pillars" of sustainability: firstly, environmental sustainability; secondly, social sustainability; and thirdly, economic sustainability (Klarin, 2018; Mensah and Casadevall, 2019). Therefore, in terms of how this CLR's two key terms (i.e., "sustainable housing" and "sustainable design") can be defined, these are considered types of housing or design that balance the three pillars (Morelli, 2011). Examples include the use of smart construction methods, wastewater treatment systems, and water preservation facilities.

Many studies indicate that technology, government policy, the residential aspirations of the population, and the diverse actions of multiple stakeholders are the key factors that affect sustainable housing and sustainable design in different countries (Rérat, 2012; Mensah and Casadevall, 2019). Moreover, trends in sustainable housing and sustainable design, as well as the degree to which sustainability is accepted, promoted, and practiced among stakeholders in the construction industry, vary considerably depending on factors such as the sector (e.g., residential or commercial buildings), as well as the country. For example, the use of green building technologies and materials, as well as state-of-the-art and efficient technologies for household energy and water conservation, is widespread in high-income and developed countries such as Switzerland (Rérat, 2012), whereas there is little awareness and acceptance for sustainable practices in other countries, particularly in low-income or rural communities (Ross et al.,; 2010; Al Surf et al., 2013).

2.2 Sustainable Housing in the KSA: Overview, History, and Trends

Following the discovery and subsequent exploitation of oil in the 1930s, the traditional society of the KSA experienced a rapid period of economic development (Al Surf et al., 2013). Over the past century, this transformation has affected all aspects of life in many areas of the country, resulting in the rise of urbanisation (10% to 75% between 1950-1992) (Library of Congress, 2011), the growth of urban sprawl in most major cities (accounting for 40% of yearly energy consumption) (Bonetti, 2009), and other substantial effects on the KSA's housing landscape.

Due to the explosive pace at which the country has developed, and even continues to develop, some scholars have identified a "housing crisis" in the KSA, suggesting that – in residential housing – the shortfall amounts to around 400,000 homes (Ferris-Lay, 2011). As a direct result of this shortfall in residential housing, paired with weaknesses in municipal administration, illegal residents, high urban land prices, and extensive rural-urban migration, unplanned settlements have emerged in many cities in the KSA (e.g., more than 50 in Jeddah alone) (Alsharif, 2013). Furthermore, recent studies show that per capita energy consumption in the KSA is around three times greater than the global average, while the residential sector contributes to around 50% of national energy usage annually (Ahmed et al., 2019).

This is evidently not a sustainable situation, and in the KSA, it is clear that the ability of the administrations, institutions, and financial organisations to manage the country's recent growth in a sustainable way will depend on the use of sustainable housing and sustainable design practices (Al Surf et al., 2013). In particular, the shortfall in residential housing and household inefficiencies should be addressed, and sustainable design practices should be applied when constructing new residential buildings to balance the environmental, social, and economic aspects of sustainability.

2.3 Sustainable Housing in the KSA: Barriers and Enablers

As noted in the previous section, sustainable housing may represent one of the most efficient and effective ways to solve the crisis in residential housing currently facing the KSA. In view of this, it is important to recognise that, as far as the general topic of "sustainability" is concerned, public awareness for the concept is low across the country, and awareness is still growing among professionals in the housing industry professionals (Susilawati and Al Surf, 2011). These represent critical barriers that must be overcome to promote sustainable housing in the KSA.

In their analysis of the barriers to and enablers of sustainable housing in the KSA, Al Surf et al. (2013) were more specific in noting that key stakeholders, including the KSA government, as well as contractors, designers, and regulators in the construction industry, tended not to be interested in applying sustainable housing, while the public were generally unaware

of the environmental, social, and economic benefits of sustainable housing. Other barriers included low levels of investment and minimal financial incentives, low availability of sustainable construction materials, low government support, and low technical knowledge among architects, technical support managers, project managers, and other stakeholders in the KSA's construction industry. For example, in their follow-up study, Al Surf et al. (2014) concluded that the Saudi Building Code, as well as the government's Ministry of Housing and Sustainable Building programme, could be revised to promote sustainable housing and sustainable design practices.

Many of the enabling factors for the promotion of sustainable housing in the KSA are effective because they can address the abovementioned barriers. For example, awareness-raising initiatives, such as the Saudi Vision 2030 (Al Surf and Mostafa, 2017), can be used to elevate public demand for sustainable design and sustainable housing. Other enabling factors include improving technical know-how among practitioners in the KSA's construction industry, introducing new laws and regulations, improving the use of renewable energy, and creating financial incentives for both construction firms and individual homeowners to engage in sustainable practices (Al Surf et al., 2013).

2.4 Technology Acceptance Model

The technology acceptance model (TAM) is one of the most relevant models to consider when exploring strategies for increasing sustainable design practices and the sustainability of residential buildings in the KSA (Diop et al., 2019). One of the main reasons for this is because, in order to promote the application of sustainable housing, a range of novel technologies must be leveraged, particularly "smart" technologies that leverage connectivity and learning to change household behaviours and construction and design practices (Ahn et al., 2015). Noteworthily, the TAM suggests that perceived ease of use (PEOU) and perceived usefulness (PU) are the main factors that influence a person's behavioural intention (BI) to use a technology (Brangier and Hammes-Adelé, 2011). Several research projects, including that of Ahn et al. (2015), have used adapted versions of the TAM to explore how acceptance for sustainable household technology can be increased, and the general finding is that, if PU and PEOU can be maximised, this can yield positive effects.

3. Research Questions

In view of the promise associated with sustainable housing and sustainable design practices as a way to address the housing crisis currently facing the KSA, paired with a knowledge of the barriers to the application of sustainable housing, several research questions (RQs) were established in order to guide the CLR. The RQs are given as follows:

- What is the level of acceptance of sustainable buildings in the general public in the KSA?
- What strategies can be used to increase the sustainability of residential buildings in the KSA? In particular, do measures exist that could enhance household energy and water efficiency?
- What is the role of government regulations in the KSA for improving the sustainability of residential buildings, and which stakeholders can promote sustainable design practices in the Saudi residential sector?

4. Methodology

For the findings of a literature review to be valid, reliable, and, consequently, valuable for researchers, stakeholders, and policymakers, methodological issues must be stated explicitly (van Wee and Banister, 2016). Therefore, this section states the rationale for choosing a critical literature review (CLR), discusses the reviewer's adoption of the pragmatist philosophy, outlines the CLR's search strategy, and explains how data were extracted and analysed from the included studies.

4.1 Rationale for Critical Literature Review

Transparency, comprehensiveness, and reliability are the key features of a systematic literature review (SLR), and these types of literature reviews are commonly considered the gold standard (Aveyard, 2014). However, given the difficulties associated with conducting an SLR, particularly in terms of time, cost, and the need for multiple reviewers (Andrews, 2017), an SLR was deemed unsuitable in the present case. As for the other available literature review types, which include scoping reviews, narrative literature reviews (NLRs), and traditional literature reviews (TLRs) (Arksey and O'Malley, 2005), these were decided against because they tend to overlook the importance of critically analysing the methodological

quality of the included studies (Galvan and Galvan, 2017). Therefore, a CLR was selected as a reasonably effective and efficient strategy for synthesising and drawing recommendations from relevant and high-quality evidence in the literature.

4.2 Philosophy

At the outset of the literature review process, the reviewer's philosophical assumptions should be identified. This is because these assumptions will strongly inform the types of decisions that are made about what constitutes acceptable evidence, as well as how the overall search strategy should proceed (Creswell, 2014). Of the three main research philosophies (namely positivism, interpretivism, and pragmatism), pragmatism was selected, which is characterised by the assertion that a combination of the positivist and interpretivist worldviews should be adopted to ensure the greatest level of flexibility when developing knowledge in a given area of research. In contrast to positivists and interpretivists, who – in order to gain knowledge about reality – prioritise the use of quantitative and qualitative data, respectively, pragmatists seek to gain diverse types of complementary data, which often enables data triangulation and the acquisition of concrete yet rich insights.

4.3 Search Strategy

4.3.1 Inclusion and Exclusion Criteria

Consistent with Meline's (2006) recommendations, inclusion and exclusion criteria were established for this CLR (Table 1). When implementing the literature search strategy, these criteria allowed the reviewer to streamline the process as a whole because the most relevant material was obtained (and irrelevant material excluded) in a relatively efficient way (Aveyard, 2014).

Table 1: Inclusion and Exclusion Criteria

	Inclusion	Exclusion	Rationale
Literature Type	Peer-reviewed literature	Grey literature	Grey literature is not peer-reviewed (Adams et al., 2016)
Language	English	Non-English languages	To avoid translation difficulties
Date	2010-2020	Prior to 2010	To ensure up-to-date evidence obtained
Design	Quantitative, qualitative, mixed-methods, and review studies	N/A	To ensure the broad scope of the CLR, and because inclusion of quantitative and qualitative studies is consistent with pragmatist philosophy
Research Setting	International	N/A	To ensure that other countries' policies can be examined
Relevance	Relevant to research question	Irrelevant to research question	Ensures CLR's objective is achieved

4.3.2 Databases

Electronic databases (e-databases) were used in this CLR to simply the task of identifying, retrieving, and extracting data from relevant studies. Several e-databases were included to facilitate broad coverage, including ScienceDirect, JSTOR, Web of Science, and Project Muse (Grewal et al., 2016).

4.3.3 Keywords

Keywords were linked together using Boolean operators (e.g., "AND", "OR", and "NOT") in order to form a search term (Grewal et al., 2016), which was subsequently entered into each of the e-databases. The search term was as follows: ("sustainable building" OR "sustainable residential housing" OR "sustainable housing" OR "sustainable design practices" OR "sustainable housing construction" OR "sustainable development") AND (government, enabler, "enabling factor", barrier, obstacle, stakeholder, "construction industry").

4.3.4 Article Screening

The article screening process outlined by Aveyard (2014) was followed, which involved (i) eliminating duplicate articles; (ii) manually searching reference lists of remaining articles; (iii) viewing the abstracts of remaining articles and excluding those that failed to satisfy the inclusion criteria; and (iv) screening full-text versions of remaining articles for eligibility. Articles that remained after the final stage of the screening process were included in the CLR, and Zotero, a popular reference manager, was used to implement the process.

4.4 Analysis of Included Studies

The research designs of the included studies were informally critically appraised, as is consistent with the recommendations of Carnwell and Daly (2001) with respect to the "critical" aspect of CLRs. While informal critical appraisal processes may increase the risk of bias, the quality of each article was evaluated based on the findings of notable methodologists to address this limitation. Additionally, in terms of how data were extracted and analysed from the included studies, thematic analysis was chosen because it is a flexible way to achieve effective data synthesis (Nowell et al., 2017). The content themes identified in this CLR were based directly on the key elements of the research questions.

5. Results and Discussion

5.1 Search Results and Included Studies

Figure 1 presents a PRISMA flow diagram, showing the key results from implementing the search strategy, while Table 2 provides an overview of the included studies.

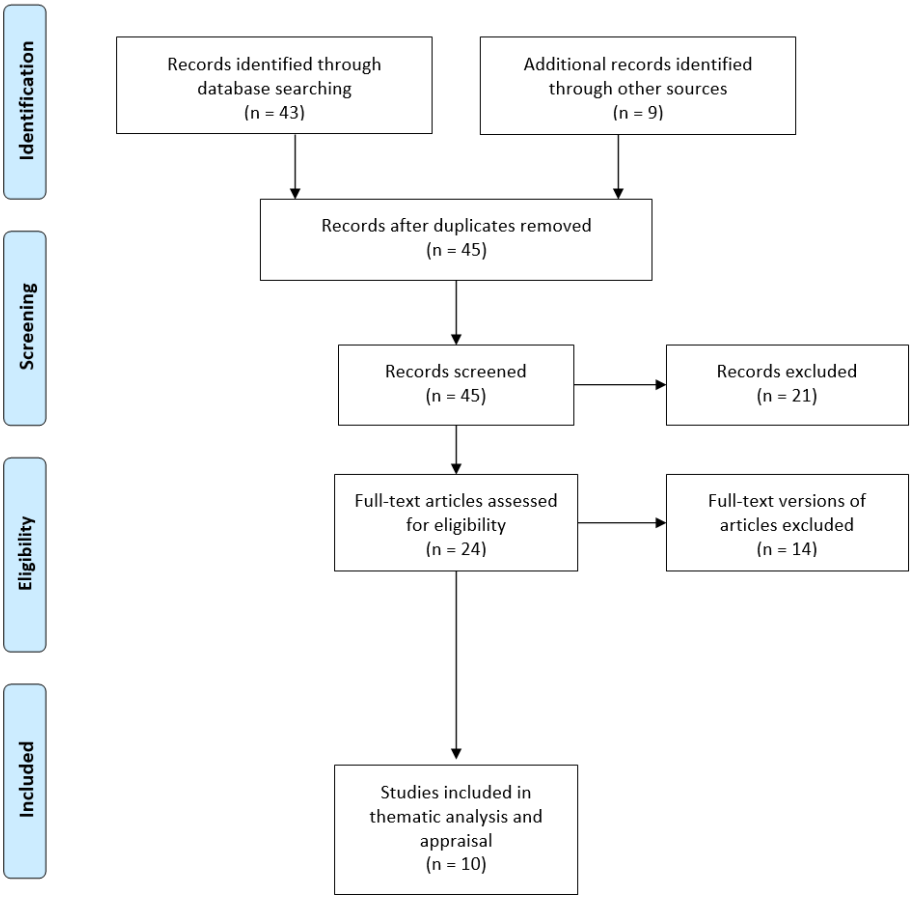

Figure 1: PRISMA Diagram

Table 2: Included Studies

Author(s)	Date	Setting
Susilawati and Al Surf	2011	KSA
Al Surf et al.	2013	KSA
Salam et al.	2014	KSA
Holdworth and Sandri	2014	International
Liang et al.	2015	UK
Pickerill	2017	International
Gaspari et al.	2017	Italy
Al Surf and Mostafa	2017	KSA
Alghamdi	2017	KSA
Ahmed et al.	2019	KSA

5.2 Critical Review and Discussion

5.2.1 Acceptance of Sustainable Buildings in the General Public in the KSA

One of the included studies, Al Surf et al. (2013), found that, because the implementation of sustainable housing development in the KSA, as well as other countries, relies on the use of smart technologies (e.g., the use of solar panels for electricity generation, flush tanks with water management systems, and water treatment systems), low public awareness and acceptance for these technologies is a highly-relevant issue for policymakers and other stakeholders to consider.

This is a key implication of the technology acceptance model (TAM) discussed in Section 2.4, which suggests that an individual's behavioural intention and level of acceptance towards adopting a technology (e.g., installing solar panels or transitioning towards sustainable housing design) are strongly dependent on perceived usefulness (PU) and perceived ease of use (PEOU). As a result, when awareness is low, as several of the included studies indicate is actually the case (Susilawati and Al Surf, 2011; Al Surf et al., 2013; Salam et al., 2014; Al Surf and Mostafa, 2017; Alghamdi, 2017), PU and PEOU will be low, meaning that overall levels of acceptance and adoption will be similarly low.

Another KSA-based study, that of Salam et al. (2014), revealed that, even for members of the general public who are aware of the benefits of using technologies for sustainability, the vertical nature of residential developments across the KSA, where 41.1% of households are in apartments, undermines their ability to accept smart technologies for sustainable buildings. As a result, when viewed through the lens of the TAM, this CLR's results regarding acceptance of sustainable buildings in the general public in the KSA suggest that, on the whole, acceptance is low.

While a first-hand glance at the data indicate that awareness and acceptance of sustainable buildings in the KSA is low among the general public, several methodological issues should be noted about the included studies. The most prominent methodological issue is that, although each of the studies was conducted in the KSA, which is positive for increasing the coverage of the data (Aveyard, 2014), the relatively homogenous samples used by all of the research groups cast a non-zero level of doubt on the question of the sample's representativeness and generalisability for the Saudi public.

For example, Al Surf's (2011) online survey included 693 participants from the Saudi Council of Engineers (620 males and 73 females), 77% of whom were 21-40 years. Therefore, although only 52.2% had heard of the term "sustainable housing" prior to participating in the research, the results could have been biased due to the homogenous sample. Similarly, the results of Al Surf et al.'s (2013) Delphi survey, which included 25 stakeholders, decision-makers, and practitioners from the KSA's housing construction sector, may have been affected by sample homogeneity. Alghamdi's (2017) survey study also focused on Saudi residents with a high educational background (specifically, university students), again reporting that awareness for sustainable development and the concept and practice of sustainable housing was low.

Taken together, the available studies that have addressed the issue of acceptance of sustainable buildings in the general public in the KSA indicate that the level of awareness and acceptance is likely to be low, but further studies with larger, more heterogenous samples may be beneficial in gauging the true extent of the situation in this respect.

5.2.2 Strategies for Increasing Sustainability of Residential Buildings in the KSA

Several included studies, spanning research contexts such as the UK, Italy, and the KSA, were relevant to the issue of strategies for increasing the sustainability of residential buildings in the KSA, particularly in terms of household energy and water efficiency. The identified strategies included the use of design processes based on building performance simulation (BPS) (Gaspari et al., 2017; Ahmed et al., 2019), the use of passive energy and water conservation methods (Liang et al., 2015; Ahmed et al., 2019), the use of so-called "eco-homes" (Pickerill, 2017), and the implementation of awareness raising initiatives (Al Surf et al., 2013; Al Surf and Mostafa, 2017).

In the case of design processes based on BPS, Ahmed et al.'s (2019) research project reported that reliance on BPS led to average electricity consumption levels in residential villas in the KSA that were 51.3% less than typical residential villas. Nevertheless, despite the positive outcomes associated with the use of BPS, know-how relating to the practice was limited among practitioners in the KSA, which will represent a critical challenge for policymakers in the KSA moving forward. Furthermore, BPS practices must be localised to the KSA context, especially in view of the substantial impact that location-specific variables such as climate, infrastructure, and population growth rate have on the capacity for BPS implementation (Gaspari et al., 2017). A limitation of Ahmed et al.'s (2019) study was the inclusion of only construction industry professionals (e.g., civil engineers, energy consultants, and contractors) in the 100-participant sample group, but this did enable the researchers to analyse the responses only of informed practitioners.

Two of the included studies, Liang et al. (2015) and Ahmed et al. (2019), drew attention to the importance of using passive energy and water conservation methods to increase the sustainability of residential buildings in the KSA. Although the cost analysis and energy consumption analysis parts of Liang et al.'s (2015) study were based on the UK context, which has a significantly different climate to the KSA, it is noteworthy that the use of passive methods contributed to a 33% reduction in annual total household energy consumption in a detached house, compared to the use of standard, non-sustainable construction materials and technologies. Notable passive methods include the use of cavity walls rather than traditional brick solid walls, as well as the use of insulation materials such as polyurethane (Liang et al., 2015). In their KSA-specific study, Ahmed et al. (2019) emphasised the importance of passive energy and water conservation methods such as window glazing type, exterior wall finish colour, window-to-wall ratio, internal shading devices, and lighting type.

Eco-homes, paired with investment in research initiatives that can identify the ways in which eco-homes can be further improved, were also identified as a potentially viable way to address the residential housing problem in the KSA (Pickerill, 2017). Additionally, raising awareness for eco-homes and other technologies is critical for the Saudi context, especially given the findings reported in Section 5.2.1. For example, Holdworth and Sandri (2014) drew attention to the potentially valuable role of sustainability education in driving long-term trends towards embracing sustainable residential housing in the KSA.

5.2.3 Role of KSA Government Regulations for Improving Sustainability of Residential Buildings

Three of the included studies laid emphasis on the critical role played by KSA government regulations for improving the sustainability of residential buildings, particularly in terms of the guidelines established in the Saudi Building Code and the KSA's Ministry of Housing (Al Surf et al., 2013; Al Surf and Mostafa, 2017; Ahmed et al., 2019). However, it is clear from the other studies, particularly those published in research settings other than the KSA (see Table 2), that collaborative efforts from all major stakeholders are essential for continued progress towards sustainability. For example, while the KSA government is responsible for standard-setting in the housing construction sector (e.g., potentially by introducing mandatory requirements for the passive measures discussed in Section 5.2.2), it is evident that, for these standards to be upheld, other stakeholders must be involved and, moreover, collaboration must be empowered (Al Surf and Mostafa, 2017).

6. Conclusion

Given the residential housing crisis that is currently facing the KSA, paired with the existence of multiple barriers towards the adoption of sustainable housing practices, this CLR sought to identify strategies for increasing sustainable design practices and the sustainability of residential buildings in the KSA. Evidence from 10 studies undertaken in several research settings, including the KSA, the UK, and Italy, was critically analysed to address the three key research issues of: (i) acceptance of sustainable buildings in the KSA's general public; (ii) measures for increasing sustainability of residential

buildings in KSA; and (iii) the role of government regulations in KSA for sustainable design in residential sector. The CLR's results suggest that acceptance of sustainable buildings is low in the KSA's general public, and a variety of novel measures – both technical and non-technical – were identified for improving the degree to which residential buildings in the KSA are sustainable. Finally, the CLR reported that, although the role of KSA government regulations in promoting sustainable housing and sustainable design practices in the country is critical, collaborative efforts from all stakeholders will be essential in the coming years to address the current housing crisis.

Reference List

Adams, Richard J., Palie Smart, and Anne Sigismund Huff. 2017. 'Shades of Grey: Guidelines for Working with the Grey Literature in Systematic Reviews for Management and Organizational Studies'. International Journal of Management Reviews 19 (4): 432–54. https://doi.org/10.1111/ijmr.12102.

Ahmed, Wahhaj, Muhammad Asif, and Farajallah Alrashed. 2019. 'Application of Building Performance Simulation to Design Energy-Efficient Homes: Case Study from Saudi Arabia'. Sustainability 11 (21): 6048. https://doi.org/10.3390/su11216048.

Ahn, Mira, Jiyun Kang, and Gwendolyn Hustvedt. 2016. 'A Model of Sustainable Household Technology Acceptance: Sustainable Household Technology Acceptance Model'. International Journal of Consumer Studies 40 (1): 83–91. https://doi.org/10.1111/ijcs.12217.

Al Surf, Mohammed S., and Lobna A. Mostafa. 2017. 'Will the Saudi's 2030 Vision Raise the Public Awareness of Sustainable Practices?' Procedia Environmental Sciences, Green Urbanism (GU), 37 (January): 514–27. https://doi.org/10.1016/j.proenv.2017.03.026.

Al Surf, Mohammed Saied, Connie Susilawati, and Bambang Trigunarsyah. 2014. 'The Role of the Saudi Government and the Saudi Building Code in Implementing Sustainable Housing Construction in Saudi Arabia'. 2014. https://www.semanticscholar.org/paper/The-role-of-the-Saudi-government-and-the-Saudi-code-Surf-Susilawati/974c0f6eece8190628d833ea92dd2989000e48ba.

Al Surf, Mohammed, Bambang Trigunarsyah, and Connie Susilawati. 2013. 'Saudi Arabia's Sustainable Housing Limitations: The Experts' Views'. Edited by Professor Mark Deakin and Dr Husam Al waer Dr Bhzad Sidawi. Smart and Sustainable Built Environment 2 (3): 251–71. https://doi.org/10.1108/SASBE-04-2013-0022.

Alghamdi, Naif. 2017. 'Knowledge and Awareness of Sustainability in Saudi Arabian Public Universities'. In Handbook of Sustainability Science and Research, 103–27.

Alsharif, Naif. 2013. 'Planning for the Unplanned: A Case Study of Slum Settlements in Jeddah, Saudi Arabia'. Muncie, Indiana: Ball State University. http://cardinalscholar.bsu.edu/bitstream/handle/123456789/197224/AlsharifN_;jsessionid=FB4DDD3FE199092E2E90342D8E9FC095?sequence=1.

Andrews, Leighton. 2017. 'How Can We Demonstrate the Public Value of Evidence-Based Policy Making When Government Ministers Declare That the People "Have Had Enough of Experts"?' Palgrave Communications 3 (1): 1–9. https://doi.org/10.1057/s41599-017-0013-4.

Arksey, Hilary, and Lisa O'Malley. 2005. 'Scoping Studies: Towards a Methodological Framework'. International Journal of Social Research Methodology 8 (1): 19–32. https://doi.org/10.1080/1364557032000119616.

Aveyard, Helen. 2014. Doing a Literature Review in Health and Social Care. 3rd ed. London: Open University Press.

Azhar, Areej, David Edgar, and Peter Duncan. 2016. 'The Impact of the Saudization Policy on Recruitment and Retention: A Case Study of the Banking Sector in Saudi Arabia'. In . https://doi.org/10.18533/job.v1i5.51.

Bonetti, M. n.d. Sustainable Social Housing Initiative. Geneva: United Nations Environment Programme.

Brangier, Éric, and Sonia Hammes-Adelé. 2011. 'Beyond the Technology Acceptance Model: Elements to Validate the Human-Technology Symbiosis Model'. In Ergonomics and Health Aspects of Work with Computers, edited by Michelle M. Robertson, 13–21. Lecture Notes in Computer Science. Berlin, Heidelberg: Springer. https://doi.org/10.1007/978-3-642-21716-6_2.

Carnwell, R., and W. Daly. 2001. 'Strategies for the Construction of a Critical Review of the Literature'. Nurse Education in Practice 1 (2): 57–63. https://doi.org/10.1054/nepr.2001.0008.

Creswell, John. 2014. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Thousand Oaks, California: SAGE.

Diop, El Bachir, Shengchuan Zhao, and Tran Van Duy. 2019. 'An Extension of the Technology Acceptance Model for Understanding Travelers' Adoption of Variable Message Signs'. PLOS ONE 14 (4): e0216007. https://doi.org/10.1371/journal.pone.0216007.

Elkington, John. 1997. Cannibals with Forks: The Triple Bottom Line of 21st Century Business. Oxford: Capstone.

Ferris-Lay, C. 2011. 'High Land Prices Crimp Plans for Low-Cost Homes'. ArabianBusiness.Com. 2011. https://www.arabianbusiness.com/high-land-prices-crimp-plans-for-low-cost-homes-435049.html.

Galvan, Jose, and Melisa Galvan. 2017. Writing Literature Reviews. 7th ed. New York: Routledge.

Gaspari, J., K. Fabbri, T. Cancellari, G. Corazzi, and V. Vodola. 2017. 'The Use of Building Performance Simulation to Support Architectural Design: A Case Study'. Energy Procedia, CISBAT 2017 International ConferenceFuture Buildings & Districts – Energy Efficiency from Nano to Urban Scale, 122 (September): 205–10. https://doi.org/10.1016/j.egypro.2017.07.346.

Grewal, Anju, Hanish Kataria, and Ira Dhawan. 2016. 'Literature Search for Research Planning and Identification of Research Problem'. Indian Journal of Anaesthesia 60 (9): 635–39. https://doi.org/10.4103/0019-5049.190618.

Holdsworth, Sarah, and Orana Sandri. 2014. 'Sustainability Education and the Built Environment: Experiences from the Classroom'. Journal for Education in the Built Environment 9 (1): 48–68. https://doi.org/10.11120/jebe.2014.00011.

Klarin, Tomislav. 2018. 'The Concept of Sustainable Development: From Its Beginning to the Contemporary Issues'. Zagreb International Review of Economics and Business 21 (1): 67–94. https://doi.org/10.2478/zireb-2018-0005.

Liang, Xinxin, Yaodong Wang, and Tony Roskilly. 2015. 'Reduce Household Energy Consumption Using Passive Methods'. Energy Procedia, Clean, Efficient and Affordable Energy for a Sustainable Future: The 7th International Conference on Applied Energy (ICAE2015), 75 (August): 1335–40. https://doi.org/10.1016/j.egypro.2015.07.203.

Meline, Timothy. 2006. 'Selecting Studies for Systematic Review: Inclusion and Exclusion Criteria'. Contemporary Issues in Communication Science and Disorders 33: 21–27.

Mensah, Justice, and Sandra Casadevall. 2019. 'Sustainable Development: Meaning, History, Principles, Pillars, and Implications for Human Action: Literature Review'. Cogent Social Sciences 5 (1). https://doi.org/10.1080/23311886.2019.1653531.

Morelli, John. 2011. 'Environmental Sustainability: A Definition for Environmental Professionals'. In . https://doi.org/10.14448/jes.01.0002.

Nowell, Lorelli S., Jill M. Norris, Deborah E. White, and Nancy J. Moules. 2017. 'Thematic Analysis: Striving to Meet the Trustworthiness Criteria'. International Journal of Qualitative Methods 16 (1): 1609406917733847. https://doi.org/10.1177/1609406917733847.

Pickerill, Jenny. 2017. 'Critically Interrogating Eco-Homes'. International Journal of Urban and Regional Research 41 (2): 353–65. https://doi.org/10.1111/1468-2427.12453.

Rahman, Md Mizanur. 2018. 'Beyond Labour Migration: The Making of Migrant Enterprises in Saudi Arabia'. International Sociology 33 (1): 86–106. https://doi.org/10.1177/0268580917745770.

Rérat, Patrick. 2012. 'Housing, the Compact City and Sustainable Development: Some Insights from Recent Urban Trends in Switzerland'. International Journal of Housing Policy 12 (2): 115–36. https://doi.org/10.1080/14616718.2012.681570.

Ross, Nicole, Paul Anthony Bowen, and David Lincoln. 2010. 'Sustainable Housing for Low-income Communities: Lessons for South Africa in Local and Other Developing World Cases'. Construction Management and Economics 28 (5): 433–49. https://doi.org/10.1080/01446190903450079.

Salam, Asharaf, Ibrahim Elsegaey, Rshood Khraif, and Abdullah Al-Mutairi. 2014. 'Population Distribution and Household Conditions in Saudi Arabia: Reflections from the 2010 Census'. SpringerPlus 3 (September). https://doi.org/10.1186/2193-1801-3-530.

Smets, Peer, and Paul van Lindert. 2016. 'Sustainable Housing and the Urban Poor'. International Journal of Urban Sustainable Development 8 (1): 1–9. https://doi.org/10.1080/19463138.2016.1168825.

Susilawati, Connie, and Muhammad Al Surf. 2011. 'Challenges Facing Sustainable Housing in Saudi Arabia: A Current Study Showing the Level of Public Awareness'. In The 17th Pacific Rim Real Estate Society Conference. Bond University, Gold Coast.

Torres, Catalina, Vladimir Canudas-Romo, and Jim Oeppen. 2019. 'The Contribution of Urbanization to Changes in Life Expectancy in Scotland, 1861–1910'. Population Studies 73 (3): 387–404. https://doi.org/10.1080/00324728.2018.1549746.

Wee, Bert Van, and David Banister. 2016. 'How to Write a Literature Review Paper?' Transport Reviews 36 (2): 278–88. https://doi.org/10.1080/01441647.2015.1065456.