

Original Article

Innovative Framework for Social Sustainability Assessment: Focusing on Mosque as Community Hub

Aldyfra Luhulima Lukman^{1*}, Sahid Sahid¹, Indri Astrina¹, Anindhita Nugroho Sunartio¹

¹Department of Architecture, Parahyangan Catholic University, Bandung, Indonesia.

*Corresponding Author : aldyfra@unpar.ac.id

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Abstract - Discussing contemporary architecture or the built environment is inseparable from the concept of sustainable development. The concept of sustainable development, which encompasses environmental, economic, and social dimensions, has become the basis for responses to current environmental issues, including resource depletion, climate change, pollution, and poverty. Social sustainability is the least discussed among the three dimensions of sustainable development. One of the problems related to the lack of discussion and firm definition of social sustainability is the scarcity of appropriate instruments for assessing social sustainability regarding architectural objects, including mosques. This study intends to provide more definitive terms for developing assessment instruments for the social sustainability of a mosque. This study combines a systematic review and content analysis to formulate the terms. Based on the analysis and synthesis, it can be concluded that the dimension of social sustainability consists of four principles (Collective Attributes, Communal Activities, Clear Aims, and Continuous Advancement) and twelve criteria (Identity, Governance, Facilities, Beliefs and Values, Inclusion and Interaction; Design Approach; Participation; Protection; Flexibility; Well-being and Quality of Life; Social Harmony and Justice; and Continuity). These principles and criteria can be applied to formulate instruments for assessing the social sustainability of a mosque and other buildings' functions and accommodating not only activities but also the development of community activities. The results of this study can be expected to benefit the sustainable development of all communities, not only Muslim communities.

Keywords - Assessment instrument, Community development, Criteria, Mosque, Social sustainability.

1. Introduction

The mosque is termed a "masjid" in the Indonesian language. The word "masjid" is derived from the Arabic sajada, which means "submissive" or "prostration" [1, 2].

The act of prostrating, which covers laying the forehead, hands, knees, and feet on the ground, symbolizes obedience to God, Allah SWT [1]. This act of prostrating also represents that all of Muslims' activities in their life should be regarded as the act of worshipping Allah SWT. Any activity performed by every Muslim in the world should be based on obedience to Allah SWT. This means that the mosque should enable all Muslims to perform their activities, representing the act of worshipping Allah SWT as comprehensively as possible [2].

The worship performed by Muslims can be differentiated into ritual and non-ritual activities. Ritual activities encompass salat (praying), wudu (ablution), reciting Al-Quran, shaum (fasting), and so forth. Non-ritual activities include charity (such as zakat and sadaqah), sermons, public lectures, discussions, and education. All of

Muslims' activities refer to Al-Quran (the holy book) and Hadith (sayings and practices of the Great Prophet Muhammad). As a vessel accommodating all Muslim activities representing their obedience to Allah SWT (both ritual and non-ritual), the mosque can be regarded as a community development center in Muslim communities [2]. Functions enabled by a mosque ideally cover both tangible and intangible aspects of ritual and non-ritual acts of Muslims. These functions, when accommodated and performed appropriately, are expected to have positive effects on the surroundings of the mosque, covering physical and social environments.

Mosques serve religious and social purposes and represent the community's identity [3]. The mosque not only serves as a place for prayer and social activities but also enhances the community's sense of belonging and identity. Spaces and rooms in a mosque are created by people to accommodate their activities and are organized based on their beliefs and aspirations [4]. A mosque is expected to be able to ensure that its ability to accommodate all Muslims' activities endures through time, while at the same time



maintaining or even strengthening and expanding its positive impacts on surrounding environments and communities. In other words, a mosque should be ecologically, economically, and socially sustainable. Those who have truly embraced Islam believe that their religion should benefit not only themselves, but also the ecological and social environments surrounding them. Social environments, in this sense, encompass both Muslims and people with other religions and beliefs.

A mosque, similar to other public buildings or facilities in this era, should respond to current environmental issues such as limited or decreasing resources, climate change, pollution, or poverty. The concept of sustainable development has become the basis of responses to the issues. In Indonesia, the concept of sustainable development concerning mosques is implemented in the program of *Eco Masjid*, or an ecologically friendly mosque. This program deals with environmental concerns in society, specifically in Muslim communities, and intends to position mosques as a center for the movement of sustainable living [5, 6]. Sustainable development is defined as meeting the present needs without damaging the human and natural environment or compromising the fulfillment of future needs [7-11]. The sustainability concept consists of three pillars or objectives, having a concentric relationship that presents mutual independence as well as ultimate reliance that affects each other: environmental, economic, and social [8, 11, 12].

There are growing concerns about social sustainability due to rising financial, housing, and socio-political problems [13, 14]. However, social sustainability is still the least discussed pillar compared to other pillars of sustainable development, environment, and economic [13, 15, 16]. One of the factors influencing the lack of discussion concerning social sustainability is the vagueness of its definition and aspects [15, 17]. Various perspectives and frameworks lead to different definitions and aspects of social sustainability [17, 18], which eventually lead to the complexity or difficulty of measuring the degree of social sustainability. One definition of social sustainability that can be regarded as comprehensive is proposed by Winston [19], specifying social sustainability as fulfilling basic human needs sufficiently to ensure people's participation in development.

Social sustainability can also be defined as a means for creating sustainable communities [11, 13, 14]. Social communities can be specified as places meeting the different needs of people, responding well to environmental contexts, and supporting a high quality of life [13]. Social sustainability is something that integrates the physical environment with the social realm [14].

One of the problems related to the lack of a firm definition of social sustainability is the scarcity of

appropriate and comprehensive instruments for assessing the implementation of the sustainable development concept in architectural objects [18] (including mosques) that address the social dimension. Instruments used by experts, practitioners, and researchers in assessing the implementation of the sustainable development concept in buildings or the built environment commonly entail the environmental pillar (such as Leadership in Energy and Environmental Design/ LEED rating system, or Green Building Council Indonesia/ GBCI rating tools). These instruments related to the environmental pillar of sustainable development might be relevant for the assessment of a mosque as an architectural object. However, there is almost no available instrument that can be used for assessing the social pillar of sustainable development in a mosque.

There are studies encompassing the aspects and measurements of social sustainability, which focus on urban environments, not specifically on buildings [13, 14]. Other studies address frameworks based on relations of the three pillars of sustainability in terms of Islamic perspectives [20-22] or the review of sustainable development of mosques based on the environmental pillar [23-27]. A synthetic process will be required to combine all scattered materials from related references addressing social sustainability and/or social aspects of mosques for formulating a definite framework or system that can be used to assess the social sustainability of mosques. This study provides both the framework for assessing the social sustainability of mosques and a mechanism that can be applied to formulate it as theoretical and practical contributions, which are not available yet in the literature used as references.

Concern linked to the importance of assessment of the social pillar of sustainable development in a mosque is based on the consideration that the social character in the relationship between a Muslim and other people (*hablumminannas*) should be as significant as personal character in the relationship between a Muslim and Allah SWT (*habluminallah*). A Muslim's obedience to Allah should be reflected in how he/she interacts with other people, not just other Muslims [3]. A mosque should be able to not just accommodate how a Muslim communicates with Allah SWT, but also facilitate and improve how he/she interacts with other people.

The social functions of mosques might be similar to those of other religious buildings/ facilities or community centres, facilitating interaction and integration of congregations or community members [28-31]. Mosques provide multifunctional spaces and facilities enabling interaction that support the self-development and well-being of their users [32, 33]. In a few cases, mosques not only accommodate social consolidation of Muslim communities but also support integration between Muslim and Non-Muslim societies, including in Non-Muslim countries [34, 35].

The broad range of these social roles of mosques highlights the significance of incorporating the social pillar into the assessment of mosque sustainability. Evaluating how effectively a mosque supports inclusiveness, social cohesion, community participation, education, welfare, and intercultural engagement provides a more comprehensive understanding of its contribution to sustainable development.

Thus, assessing the social performance of mosques is vital to ensure that they fulfil not only their religious functions but also their more extensive responsibilities as institutions promoting the well-being, resilience, and harmonious development of the communities they serve. Assessment of this social performance will require comprehensive and reliable instruments, which are expected to be formulated through what will be obtained in this study.

In order to provide clarity regarding the intention of this study, the terms describing aspects and their position commonly used in the instrument for the assessment should be clearly defined and distinguished first. The terms commonly used to describe the assessment aspects in the instruments consist of dimension(s), principle(s), criterion/criteria, indicator(s), and parameter(s).

Dimension can be defined as "a part or feature or way of considering something" [36]. 'Principles' can be characterized as the fundamental statements concerning a desired outcome [37]. Criteria can be specified as the conditions that need to be assembled for complying with a Principle [37]. 'Indicators' can be described as the measurable states allowing the assessment of whether a particular criterion has been assembled or not [37].

Parameters can be expressed as "a set of facts or a fixed limit that establishes or limits how something can or must happen or be done" [36]. The example regarding the relationship of dimension(s), principle(s), criterion/criteria, indicator(s) and parameter(s) can be described as follows: 1) Built environment is one of the dimensions in architecture, 2) Comfort is one of the principle in assessing the built environment, 3) Physical comfort is one the criteria when assessing comfort in the built environment, 4) Thermal comfort is one of the indicators in measuring physical comfort in the built environment, 5) Temperature is one of the parameters in measuring thermal comfort. Figure 1 presents the order and hierarchy of dimension(s), principle(s), criterion/criteria, indicator(s), and parameter(s) from conceptual to operational.

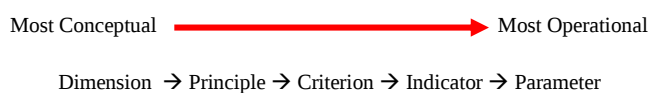


Fig. 1 The order and hierarchy of dimension(s), principle(s), criterion/criteria, indicator(s) and parameter(s)

This clear definition and distinction of the terms and their relationships is vital, because a few references interchangeably use and place the same terms in different hierarchies or positions. This study intends to synthesize and provide more definitive terms and their positions that can be used to develop instruments for assessing the social sustainability of a mosque by referring to various credible references. It is expected that instruments developed based on the output of this study can be compatible for measuring the social sustainability of buildings or architectural objects that facilitate not only religious activities but also other functions as well. This compatibility of the instruments may promote and strengthen the inclusive characteristics of a mosque and Islam.

2. Materials and Methods

This study applies a qualitative-archival research method [38] to define more definitive terms and their positions based on materials discussed in the existing written references in the world that can be used to develop assessment tools for measuring the social sustainability of a mosque.

The qualitative-archival research method applied in this study consists of two stages: 1) a systematic review and 2) content analysis. A systematic review is conducted to select, summarize, and criticize texts in the research or articles [39] considered relevant to this study's topic: the social sustainability of a mosque. Content analysis is performed to identify, analyze, classify, and position terms [40] in the systematic review results and the literature discussing social sustainability in general. Systematic review is considered an appropriate method for the study to identify relevant references [41], whereas content analysis is regarded as a suitable approach for determining the scope and the terms [40].

Systematic review involves all academic resources that can be publicly assessed in Google Scholar and Scopus databases through the searches performed on 22 March 2023 and 8 October 2025. The Scopus database is included based on feedback received in several discussions, as references found in Google Scholar still need to be complemented by more robust literature.

The eligibility or inclusion criteria concerning the resources consist of 1) The article is in the form of PDF or HTML that can be publicly/ openly accessed; 2) The article must be published in a journal or proceeding that is managed by trusted or credible publishers; 3) Must be published in the last 12 years (2013-2025); 4) The article must contain topics addressing both the mosque and social sustainability; 5) The article must be written in English. The inclusion criteria are based on the consideration that reviewed resources, which are the recent ones, and outputs of the review should be accessible and comprehensible to

readers of this study from different countries with various backgrounds. The inclusion criteria, which are expected to be as objective and measurable as possible, are also intended to ensure the quality of the selection process and minimize researcher bias.

The search for articles was conducted by using these keywords: "Social Sustainability", AND "Mosque", AND "Criteria", OR "Indicator". The rationale for including the words "criteria" and "indicator" is to obtain resources containing assessment procedures or tools without being too limiting in the searching process.

Content analysis applied in this study aims to specify appropriate terms and their positions by combining phrases identified in the results of a systematic review with terminologies found in selected literature addressing social sustainability.

The outputs of content analysis can be classified as dimensions, principles, criteria, indicators or parameters. Although content analysis in this study focuses on generating inferences based on emerging patterns, this study presents the relations of aspects in the inferences, which is closer to relational analysis [28].

Content analysis in this study entails these stages: 1) Data collection; 2) Data Reduction/ Coding; 3) Interconnection of Data; 4) Development of Theme; and 5) Conclusion. The coding process in this study consists of: 1)

Developing a coding scheme; 2) Assigning codes to data; 3) Refining and validating codes; and 4) Developing categories and themes.

The processes of coding and development of themes are conducted using QDA Miner Lite Software. This study intends to define the themes based on the patterns identified through the coding process without prioritizing or weighting one theme over the other.

This study deals with written references publicly published online, not direct interactions with humans. Therefore, this study does not require an ethical declaration regarding human involvement. All data regarding references used in this study are presented in the following section. There are no conflicts of interest in this study.

3. Results and Discussion

The search for articles using the determined keyword as part of a systematic review, lead to results as follows: 1) There were 338 resources appearing in Google Scholar and 45 resources occurring in Scopus, 383 resources in total; 2) Only 11 of 383 resources that are available in a form of PDF or HTML that can be publicly/ openly accessed and address the mosque and/or social sustainability; 3) Only seven of 11 resources that can meet all the inclusion criteria. These seven resources are then analyzed to identify the terms or phrases that are relevant to the social sustainability of a mosque (see Figure 2 and Table 1).

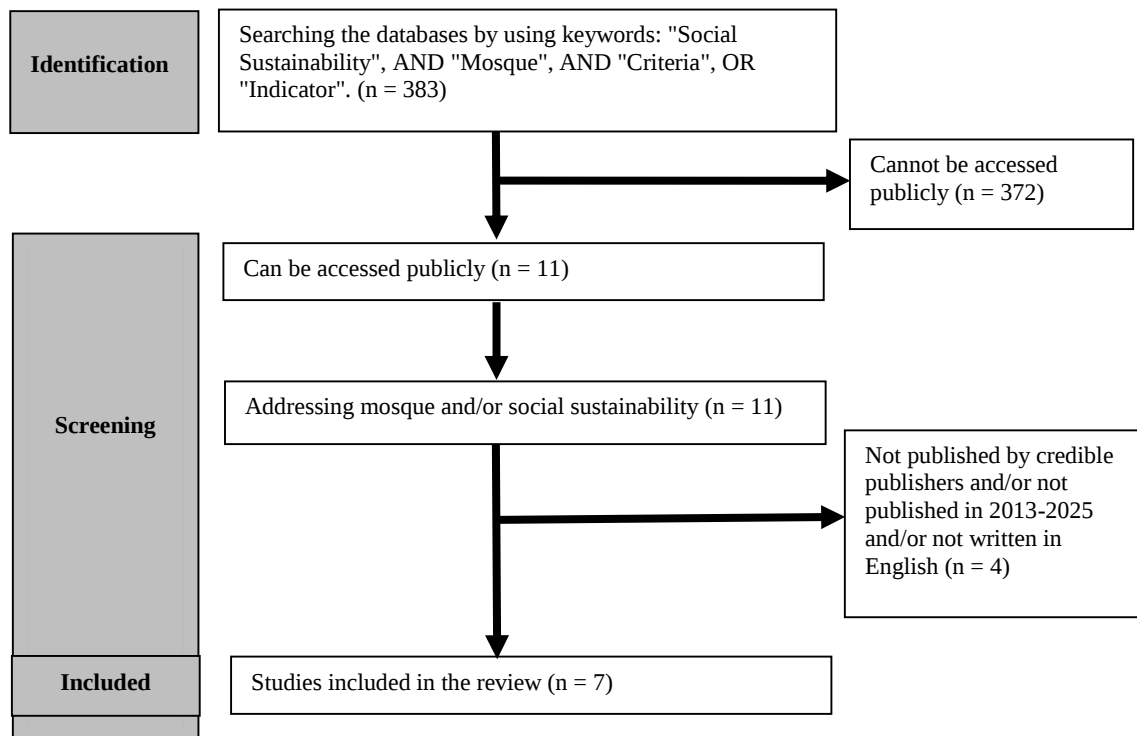


Fig. 2 The PRISMA flow diagram was used in this study

Table 1. Six resources matched the inclusion criteria

No	Resource	Method	Can be publicly accessed	Credible Publisher	Addressing		Written in English
					Mosque	Social Sustainability	
1	Ismailoglu & Sipahi [42]	✓	✓	✓	✓	✓	✓
2	Sobri et al. (2021) [39]	✓	✓	✓	✓	✓	✓
3	Jaffar, Harun, & Abdullah [43]	✓	✓	✓	✓	✓	✓
4	Kamarulzaman, M.H. et al. [44]	✓	✓	✓	✓	✓	✓
5	Adi & Puspitasari [1]	✓	✓	✓	✓	✓	✓
6	Ahmad, et al. [3]	✓	✓	✓	✓	✓	✓
7	Amghani et al. [45]	✓	✓	✓	✓	✓	✓

Table 2. Keywords, terms, or phrases related to Social Sustainability identified in the resources

No	Resource	Containing dimension, principles, criteria, indicators, and/or parameters of social sustainability	Object related to the dimension, principles, criteria, indicators, and/or parameters of social sustainability	Identified keywords, terms, or phrases related to aspects of Social Sustainability
1	Ismailoglu, S., & Sipahi, S [42]	✓	Architecture, Building, or Environment	• Preservation of local characteristics • Ability to fulfill psychological needs • Townscape design • Provision of local infrastructure • Availability of job opportunities • Accessibility
2	Sobri et al. [39]	✓	Mosque	• Social Equity • Quality of life. • Well-being
3	Jaffar, Harun, & Abdullah [43].	✓	Mosque	• Convenient access • Comfort and cleanliness • Social aspects
4	Kamarulzaman, M.H., Zoolkefli, Z., Ibrahim, S.S., Musa, A.H., Baharuddin, F.N., & Rosle, A.N. [44]		Heritage Mosque	• Community-based • Cultural and environmental stewardship • Economic development
5	Adi and Puspitasari [1]	✓	Architecture, Building, or Environment	• Health & Safety • Impact on local communities and quality of life • Benefits to disadvantaged groups
6	Ahmad, T., Thaheem, M. J.,	✓	Architecture, Building, or Environment	- Indicator 1: User comfort and safety • Parameter: Indoor environmental quality

	Anwar, A., & Ud Din, Z. [3]			• Parameter: Health and well-being • Parameter: Safety • Parameter: Open space availability • Parameter: Number of facility users • Parameter: Community amenities provision • Parameter: Accessibility Indicator 2: Functional, aesthetic & innovative design approach • Parameter: Usability, functionality, and aesthetic aspects • Parameter: Innovation & design process • Parameter: Architectural considerations, integration of cultural heritage & compatibility with local heritage values
7	Amghani, M.S., Sabouri, M.S., Baghernejad, J. & Norozi, A. [45]		Community	• Social Equity • Social Structures • Social Relations • Social Capital • Social Resources • Social Protection • Social Frameworks • Social Assets • Social Solidarity • Social Support

Five of the seven resources contain dimensions, principles, criteria, indicators, and/or parameters of social sustainability. Two of the seven resources address dimensions, principles, criteria, indicators, and/or parameters of social sustainability in relation to mosques. Three of the seven resources cover dimensions, principles, criteria, indicators, and/or parameters of social sustainability in relation to architecture, building, or environment in general, although their topics are about mosques. Two of the seven resources that do not explicitly mention dimensions, principles, criteria, indicators, and/or parameters of social sustainability focus on community tourism in relation to the historical mosque and on the community livelihood of farmers. Table 2 displays the terms related to social sustainability identified in these seven resources.

The terms derived from the systematic review are subsequently used in the content analysis. Content analysis involves five references addressing social sustainability in relation to architecture or the built environment, other than resources included in the systematic review. Five references are deliberately selected based on the criteria of recency and comprehensiveness.

The first reference is written by Winston [19], focusing on social sustainability in terms of housing and community. Winston [19] proposes a concise and comprehensive definition of social sustainability. Social sustainability is defined as addressing basic human needs sufficiently to

ensure the ability of individuals to participate in the development of society. Winston [19] does not specify dimensions, principles, criteria, indicators, or parameters of social sustainability. Nevertheless, there are a few keywords related to social sustainability that can be extracted from the definition proposed by Winston [19]: addressing basic human needs, sufficiency, and participating in society's development.

The second reference is written by Mak and Peacock [8], addressing social sustainability in terms of community. Based on their literature review, Mak and Peacock [8] conclude that the sustainability concept comprises three dimensions: environmental, economic, and social. The social sustainability dimension suggested by Mak and Peacock [8] can be complemented by the indicators and parameters from other researchers [3, 12, 18]

According to Ahmad et al. [3], the environmental dimension comprises four indicators: 1) Climate change; 2) Emissions; 3) Water efficiency; and 4) Depletion of Resources. Climate change contains one parameter: global warming potential. Emissions cover six parameters: 1) Acidification potential; 2) Inert waste to disposal; 3) Hazardous waste to disposal; 4) Eutrophication potential; 5) Smog potential; 6) Ozone depletion potential. Water efficiency embraces two parameters: 1) Rainwater use and 2) Potable water use. Depletion of resources involves three

parameters: 1) Land use; 2) Depletion of material resources; and 3) Depletion potential of fossil fuels.

Referring to Ahmad et al. [3], the economic dimension covers two indicators: 1) Life cycle costing (LCC) values and 2) Affordability, Manageability, and Adaptability. LCC values include two parameters: 1) Capital cost and 2) Life Cycle Cost. Affordability, Manageability, and Adaptability consist of three parameters: 1) Adaptability and flexibility of building; 2) Affordability and economic performance; and 3) Manageability aspects of building.

Corresponding to Ahmad et al. [3], the social dimension includes two indicators: 1) User comfort and safety; and 2) Functional, Aesthetic, and Innovative Design Approach. User comfort and safety comprises seven parameters that involve needs about physical and psychological aspects of humans [3, 18]: 1) Indoor environmental quality affecting the process of respiration; 2) Health and well-being; 3) Safety; 4) Open space availability; 5) Number of facility users; 6) Community amenities provision; 7) Accessibility. Functional, Aesthetic, and Innovative Design Approach, leading to creative and comprehensive solutions for human environments, encompasses three parameters [3, 12]: 1) Usability, functionality, and aesthetic aspects; 2) Innovation and design process; 3) Architectural considerations, integration of cultural heritage, and compatibility with local heritage values.

Mak and Peacock [8] also conclude that perspectives of social sustainability can be differentiated based on their orientation: development, environment, and people. A development-oriented perspective focuses on social relations, values, customs, and structures. An environment-oriented perspective emphasizes development that meets people's conditions, norms, and preferences required for supporting ecologically sustainable actions concerning equal and intergenerational distribution of resources. A people-oriented perspective promotes development to keep levels of social cohesion and avert social exclusion and polarization.

According to Mak and Peacock [8] in their literature review, social sustainability should cover: 1) Human rights; 2) Labour rights; 3) Governance; and 4) Access to social resources. Human rights are rights inherent to all individual, regardless of the variety of their origins, backgrounds, characteristics, or any other status, such as the right to live, to work, to gain opportunities for fulfilling basic needs, and many more. Labour rights can be defined as rights contained in the relations between employees and employers. Governance can be specified as the system directing and controlling every member of the community to ensure social harmony and justice in the community's life. Access to social resources should be maintained or improved across generations to protect or strengthen the quality of social life.

The third reference is written by Mehan and Soflaei [17], addressing social sustainability in terms of urban contexts. According to Mehan and Soflaei [17], social sustainability can be described through frameworks that are based on its condition, process, measurement or future focus. A framework that is based on condition defines social sustainability as a condition where basic needs are fulfilled for all individuals regardless of their race, gender, age, religion, socioeconomic status, and/or ability, and the highest possible degree of social inclusion and participation can be achieved. A condition-based framework also connects social sustainability to social norms and conditions, requiring that any environmental or economic decision must not surpass the community's tolerance regarding changes. A framework that is based on process positions social sustainability as something that enhances the lives of the communities and enables the communities to achieve the enhancement. Process-based framework also regards that social sustainability, supported by policies and institutions, ensures harmony in social relations, enhances social integration, and improves the living conditions of all types of individuals.

A framework that is based on measurement specifies that social sustainability enables communities to embrace equity, diversity, connection, democracy, and a good quality of life. Measurement-based framework also implies that previous hard and measurable social sustainability themes (such as employment and alleviation of poverty) can be complemented or replaced by softer and less measurable themes (such as happiness, sense of place, and social mixing). A framework that is based on future focus characterizes social sustainability as something that enables present and future generations to maintain and improve their ability to achieve well-being. Referring to Mehan and Soflaei [17], aspects for assessing social sustainability in terms of urban contexts, consist of: 1) Social equity; 2) Satisfaction of human needs; 3) Well-being and happiness; 4) Quality of life; 5) Social interaction and mixing; 6) Identity, culture, pride and sense of place; 7) Sense of community; and 8) Future focus.

Social equity indicates the condition where everyone has an equal degree of access to resources. Equal access to resources ensures the fulfilment of needs satisfactorily [46]. Well-being, happiness, and quality of life signify the state of individual/ community positive responses toward his/her/ their life and surroundings [41, 46]. Social interaction and mixing are related to rights and opportunities to participate in community activities and interact with other members of the community and/or other communities having diverse backgrounds and characteristics, without being worried about social exclusion. Identity, culture, and pride can be specified as properties that can create bonds among different individuals but also can differentiate an individual or a group from others, which can be preserved and/or developed

from time to time [47]. Sense of place can be described as an emotional state instigating an individual or a group to be attached to a specific setting. A sense of community can be outlined as shared beliefs, values, and expectations among community members living in a particular environment, which motivate them to have commitment to shaping and preserving the community and the environment. Future focus entails the vision and efforts of maintaining positive aspects of cultures across generations.

The fourth reference is written by Kefayati and Moztarzadeh [48], focusing on social sustainability in terms of architecture. Similar to the dimensions of sustainability addressed in the reference written by Mak and Peacock [8], Kefayati and Moztarzadeh [48] suggest that the objectives of sustainability can be classified into three types: environmental, economic and social.

According to Kefayati and Moztarzadeh [48], environmental objectives include: 1) making an exceptional environmental quality; 2) promoting reusability; 3) eliminating waste and residues; 4) utilizing less construction materials; 5) recycling building materials; 6) recycling water; and 7) eliminating emissions. Referring to Kefayati and Moztarzadeh [48], economic objectives cover: 1) Generating first-class values; 2) Reducing costs; 3) Minimizing energy consumption; 4) Delivering easily applicable methods of production and prospective solutions. Corresponding to Kefayati and Moztarzadeh [48], social objectives encompass: 1) Creating a sense of security; 2) Supporting adaptability; 3) Engaging quality; 4) Eliminating poverty; 5) Making sound insulation; 6) Providing flexible programs; 7) Promoting healthy life; 8) Providing home care; and 9) Offering permanent training. The sustainability concept in the 1980s focused on environmental objectives, in the 1990s emphasized environmental and economic

objectives, and since the 2000s has embraced all the objectives. According to Kefayati and Moztarzadeh [48], the objectives of social sustainability determine socially sustainable development. Table 3 presents the relations between the objectives and the development based on social sustainability.

Referring to Kefayati and Moztarzadeh [49], components or aspects of social sustainability have various terms depending on who defines or discusses them. Kefayati and Moztarzadeh [48] argue that components of social sustainability include (2): 1) Partnership; 2) Security; and 3) Quality of life (QoL). Each component has explanatory criteria, and each explanatory criterion possesses sub-explanatory criteria (2). Explanatory criteria of partnership encompass: 1) Social coherence and 2) Social participation. Explanatory sub-criteria of social coherence comprise: 1) sense of belonging; 2) interaction; and 3) Responsibility. Explanatory sub-criteria of social participation consist of participation in: 1) cultural activities; 2) religious activities; 3) recreational activities; and 4) local activities. Explanatory criteria of security cover: 1) Social security and 2) Social trust. Explanatory sub-criteria of social security entail objective dimension (such as decreased number of crimes) and subjective dimension (such as public perception). Explanatory sub-criteria of social trust embrace interpersonal and institutional/ civic trust.

Explanatory criteria of QoL embrace: 1) Subjective dimension and 2) Objective dimension. Explanatory sub-criteria of the subjective dimension of QoL encompass: life satisfaction and/or happiness, and satisfaction in terms of quality of access to services. Explanatory sub-criteria of the objective dimension of QoL include: social justice and satisfaction with the level of access to services.

Table 3. The relationship between objectives and characteristics of social sustainability (Adapted from: Kefayati & Moztarzadeh [48])

Objectives of Social Sustainability	Characteristics of Social Sustainability Development
Fulfilling the basic human needs	Fulfilling the basic needs
Emphasizing the equitable distribution of lifelong development opportunities	Ensuring that the benefits of development are equally distributed in the community
Overcoming individual inability	Promoting education, creativity, and capacity development in the community
Recognizing diversity and developing social tolerance	Improving or at least not harming the welfare of the community physically, socially, and mentally
Developing individual and social responsibility	Preserving heritage (culturally and biologically) and enhancing connection with history
	Providing better living conditions by connecting the design of public facilities with the welfare and enthusiasm of citizens
Maintaining and strengthening social capital for creating and supporting civil institutions	Promoting the participation of citizens

Kefayati and Moztarzadeh [48] suggest that aspects for assessing social sustainability in relation to architecture include (2): 1) Social interaction; 2) Architectural identity; 3) Social security; 4) Flexibility; 5) Beliefs and convictions; and 6) Social participation. Architecture should be able to appropriately accommodate or even enhance the interaction between an individual or a group and others. Architectural identity entails inherent features of the built environment accommodating the life or activities of human beings. Social security embraces the capability of architectural spaces to create or improve a sense of security when individuals or groups perform activities within.

Flexibility encompasses the diversity and adaptability of spaces. Diversity indicates that multifunctional spaces enable changes of their function proportional to requirements. Adaptability enables mobility in and across spaces proportional to changes in time. Social participation entails the capability of architectural spaces or objects in accommodating or strengthening how an individual can play a significant role or contribute to community life, thereby increasing the quality of the community.

It is important to note that Kefayati and Moztarzadeh [48] interchangeably used the terms "indicators" and "criteria" for labelling aspects intended to be applied in assessing social sustainability in terms of architecture, which leads to ambiguity in interpreting the positions of these aspects.

The fifth reference is written by Ng et al. [50], addressing social sustainability in terms of mosques. Ng et al. [49] do not actually use the term "social sustainability" in their article. Ng et al. [49] apply the term "social inclusion" to describe the characteristics of social sustainability of a mosque. Ng et al. [49] argue that social inclusiveness of a mosque can be measured by these criteria: 1) Perception; 2) Permeability; and 3) Territoriality. Perception entails: 1) the use of local materials that can enhance the sense of familiarity and belonging; 2) the scale and mass of the mosque that can determine the sense of inviting or welcoming; 3) the ability of the building to defend its historical identity. Permeability engages 1) visual permeability that can signify a sense of sharing with outsiders; 2) visibility of entrances and exits specifying the publicness of the buildings. Territoriality signifies how accessible the buildings are to the users.

The keywords, terms, or phrases applied to describe aspects of social sustainability in various references used in this study were compared and analyzed to identify their patterns (see Table 4). The comparison and analysis were intended to determine to what extent the terms could be merged and classified. The merger and classification were expected to serve as foundations for synthesizing more compact and comprehensive keywords, terms, or phrases.

Table 4. Keywords, terms, or phrases related to Social Sustainability in the selected references

Reference	Context	Identified keywords, terms, and phrases related to Social Sustainability
Winston [19]	Housing & community	• Address the basic human needs • Sufficiency • Participating in society development
Mak & Peacock [8]	Community	• Human rights • Labour rights • Governance • Access to social resources
Mehan and Soflaei [17]	Urban	• Social equity; • Satisfaction of human needs; • Well-being and happiness; • Quality of life; • Social interaction and mixing; • Identity, culture, pride, and sense of place • Sense of community • Future focus
Kefayati and Moztarzadeh [48]	Architecture	• Social interaction; • Architectural identity; • Social security and trust; • Flexibility; • Beliefs and convictions; • Social participation
Ng et.al [49]	Mosque	Social inclusion • Criteria: Sense of familiarity and belonging • Criteria: Sense of inviting and welcoming • Criteria: Historical identity • Criteria: Visibility and visual permeability • Criteria: Territoriality and accessibility

There are 79 keywords, terms, or phrases regarded as relating to aspects of social sustainability, which are derived from the results of a systematic review and selected references concerning social sustainability. Some keywords, terms, or phrases identified in the results of the systematic review and selected references concerning social sustainability are combined into one keyword, term, or phrase when they were interpreted as having the same meaning and scope, such as "participating in society development" and "social participation", which are combined into "social participation". Other keywords, terms, or phrases that appear as having similar or parallel meaning are kept being treated as separate keywords, terms, or phrases when they are regarded as having different scopes, such as "security" (which could refer to personal and/or social) and "social security".

The 79 keywords, terms, or phrases that have been processed are then coded and classified into three categories based on the resources they are coming from by using QDA Miner Lite. The categories consist of: 1) Category 1: keywords, terms or phrases that only appear in the references discussing social sustainability in general (which are labelled by the codes "G1" to "G59" and displayed in Table 5); 2) Category 2: keywords, terms or phrases that only appear in the references specifically discussing social sustainability in relation to the mosques (which are marked by the code "M1" to "M15" and presented in Table 6); and 3) Category 3: keywords, terms or phrases that appear in the references discussing social sustainability in general and in relation to mosques (which are marked by the code "GM1" to "GM5" and shown in Table 7). The meanings and scopes of the keywords, terms, or phrases do not determine the category in which they are placed. There are different keywords, terms, or phrases placed in separate categories, although they might have similar meanings, because they are derived from different references.

There are unique features identified in the references containing the topics that are related to the mosques. In these references, "belief", which is considered to have a close relationship with religious activities accommodated by the mosque, does not emerge as representing one of the aspects of social sustainability.

Interestingly, the word "belief" appears as one of the aspects of social sustainability in the reference written by Kefayati and Moztarzadeh [48] discussing social sustainability in relation to architecture. Another unique feature in the references containing the topics that are related to the mosques is the word "cleanliness". The word "cleanliness" can be regarded as a differentiating aspect that distinguishes social sustainability in general and social sustainability in relation to the mosques. The word "cleanliness" may indicate the character of "purity" or "sacredness" relating to religious functions of the mosques.

Table 5. Keywords, terms, or phrases that only appear in the references discussing social sustainability in general

No	Code	Keywords, Terms, or Phrases related to social sustainability
1	G1	Ability to fulfil psychological needs
2	G2	Access to social resources
3	G3	Address the basic human needs
4	G4	Aesthetic aspect
5	G5	Aesthetic design approach
6	G6	Architectural consideration
7	G7	Architectural identity
8	G8	Availability of job opportunities
9	G9	Beliefs
10	G10	Benefits to disadvantaged groups
11	G11	Community amenities provision
12	G12	Community stability
13	G13	Compatibility with local heritage values
14	G14	Convictions
15	G15	Culture
16	G16	Design process
17	G17	Flexibility
18	G18	Functional design approach
19	G19	Functionality aspect
20	G20	Future Focus
21	G21	Governance
22	G22	Happiness
23	G23	Health
24	G24	Human rights
25	G25	Identity
26	G26	Impact on local communities
27	G27	Impact on quality of life
28	G28	Indoor environmental quality
29	G29	Innovation
30	G30	Innovative design approach
31	G31	Integration of cultural heritage
32	G32	Labour rights
33	G33	Number of facility users
34	G34	Open space availability
35	G35	Preservation of local characteristics
36	G36	Pride
37	G37	Provision of social infrastructure
38	G38	Safety
39	G39	Satisfaction of human needs
40	G40	Security
41	G41	Sense of community
42	G42	Sense of place
43	G43	Social asset
44	G44	Social capital
45	G45	Social frameworks
46	G46	Social interaction
47	G47	Social mixing
48	G48	Social participation
49	G49	Social protection
50	G50	Social relations

51	G51	Social resources
52	G52	Social security
53	G53	Social solidarity
54	G54	Social structures
55	G55	Social support
56	G56	Social trust
57	G57	Sufficiency
58	G58	Townscape design
59	G59	Usability aspect

Table 6. Keywords, terms, or phrases that only appear in the references specifically discussing social sustainability in relation to the mosques

No	Code	Keywords, Terms, or Phrases related to social sustainability
1	M1	Cleanliness
2	M2	Community based
3	M3	Cultural stewardship
4	M4	Economic development
5	M5	Environmental stewardship
6	M6	Historical identity
7	M7	Sense of belonging
8	M8	Sense of familiarity
9	M9	Sense of inviting
10	M10	Sense of welcoming
11	M11	Social aspects
12	M12	Social inclusion
13	M13	Territoriality
14	M14	Visibility
15	M15	Visual permeability

Table 7. Keywords, terms, or phrases that appear in the references discussing social sustainability in general and in relation to mosques

No	Code	Keywords, Terms, or Phrases related to social sustainability
1	GM1	Accessibility
2	GM2	Comfort
3	GM3	Quality of life
4	GM4	Social equity
5	GM5	Well-being

The 79 keywords, terms, or phrases are classified into three categories and then are inserted into twelve themes according to the interpretation of their meanings. The processes of identifying keywords, classification, and developing themes are performed by using QDA Miner Lite software, commonly applied in qualitative research. Keywords, terms, or phrases are included in more than one theme because their meanings are regarded as being connected to a few themes. These twelve themes comprise: 1) Identity; 2) Governance; 3) Facilities; 4) Beliefs and Values; 5) Inclusion and Interaction; 6) Design Approach; 7) Participation; 8) Protection; 9) Flexibility; 10) Well-being and Quality of Life; 11) Social Harmony and Justice;

and 12) Continuity. This classifying process marks the separation between describing results and discussing the interpretations.

Identity can be defined as a feature that defines an entity and makes it unique. Governance is the system that regulates the actors and their actions to maintain social harmony and justice. Facilities can be described as human-made features that can be used by an individual or a community to take action. Beliefs and values are inherent and fundamental aspects possessed by an individual or a group that guide his/her/their actions. Inclusion and interaction are requirements for community members to be able to act together for the interest of the community. Design approach is the way of thinking related to the provision of facilities accommodating or support the community's actions. Participation encompasses how an individual or some people can play a significant role or contribute to community life in order to make it better. Protection signifies the facilities and efforts intended to ensure that every individual or member of the community is safe and secure, sheltered from disasters or criminal acts. Flexibility indicates the capability of the facilities to be adjusted according to different characteristics and requirements of various communal activities. Well-being and quality of life specify the state of an individual's or a group's emotional and cognitive positive response to his/her/their life. Social harmony and justice designate the order and equilibrium in a system embracing different members of a community or different communities with various characteristics, backgrounds, or interests. Continuity denotes never-ending efforts to improve the quality of community life across generations, from time to time.

The interpretation and insertion process of generating themes can be explained through the following example. Culture, heritage, preservation, local characteristics and pride can be regarded as aspects related to how an individual or a community define him/ her/ themselves and forms a sense of belonging to something or a larger group having features. Therefore, these aspects can be placed under the theme "identity". The themes themselves are extracted based on materials derived from five references discussing the social sustainability of architecture or the built environment in general, other than resources included in the systematic review, which address social sustainability related to mosques.

These twelve themes can be grouped into four new categories: 1) Collective Attributes; 2) Communal Activities; 3) Clear Aims; and 4) Continuous Advancement. The labels of the categories are based on the same patterns: the initial letter of the first word is "C" and the initial letter of the second word is "A". The rationale for the categories' labels is ease of memorization. Collective attributes, which include 1) identity, 2) governance, 3) facilities, and 4) beliefs

and values, indicate what a community needs or should have to perform social activities. Communal activities, which incorporate 1) inclusion and interaction, 2) design approach, 3) participation, 4) Protection, and 5) Flexibility, encompass everything that the community does to achieve its common objectives. Clear aims, which embrace 1) well-being and

quality of life and 2) social harmony and justice, are the life goals that a community or its members want to achieve. Continuous advancement involving continuity entails sustainable efforts to make a better social life for future generations. The new classification is shown in Table 8.

Table 8. Interpretation and classification

New Category	New Themes	Code	Keywords, Terms, or Phrases related to social sustainability
Collective Attributes	Identity	G7	Architectural identity
		G13	Compatibility with local heritage values
		G15	Culture
		M3	Cultural stewardship
		M6	Historical identity
		G25	Identity
		G31	Integration of cultural heritage
		G35	Preservation of local characteristics
		G36	Pride
		M7	Sense of belonging
		G41	Sense of community
		M8	Sense of familiarity
		G42	Sense of place
		G43	Social asset
		M13	Territoriality
	Governance	G2	Access to social resources
		G8	Availability of job opportunities
		G12	Community stability
		G14	Convictions
		M3	Cultural stewardship
		M4	Economic development
		M5	Environmental stewardship
		G21	Governance
		G24	Human rights
		G32	Labour rights
		G45	Social frameworks
		G48	Social participation
		G52	Social security
		G54	Social structures
		G56	Social trust
	Facilities	GM1	Accessibility
		G2	Access to social resources
		G6	Architectural consideration
		G7	Architectural identity
		G11	Community amenities provision
		M5	Environmental stewardship
		G17	Flexibility
		G28	Indoor environmental quality
		G33	Number of facility users
		G34	Open space availability
		G37	Provision of social infrastructure

		G43	Social asset
		G44	Social capital
		G51	Social resources
		G58	Townscape design
	Beliefs and Values	G9	Beliefs
		G13	Compatibility w/ local heritage values
		G15	Culture
		G24	Human rights
		G31	Integration of cultural heritage
		G32	Labour right
Communal Activities	Inclusion and Interaction	G2	Access to social resources
		GM1	Accessibility
		M2	Community-based
		G24	Human rights
		M7	Sense of belonging
		G41	Sense of community
		M8	Sense of familiarity
		M9	Sense of inviting
		G42	Sense of place
		M10	Sense of welcoming
		M11	Social aspects
		M12	Social inclusion
		G46	Social interaction
		G47	Social mixing
		G50	Social relations
		G53	Social solidarity
		G55	Social support
		M14	Visibility
		M15	Visual permeability
	Design Approach	G4	Aesthetic aspect
		G5	Aesthetic design approach
		G6	Architectural consideration
		G7	Architectural identity
		M2	Community-based
		G16	Design process
		G17	Flexibility
		G18	Functional design approach
		G19	Functionality aspect
		G29	Innovation
		G30	Innovative design approach
	Participation	G50	Usability aspect
		G2	Access to social resources
		G8	Availability of job opportunities
		M2	Community-based
		M3	Cultural stewardship
		M5	Environmental stewardship
		G26	Impact on local communities
	Protection	G47	Social mixing
		G48	Social participation
		M1	Cleanliness
		G38	Safety
		G40	Security

		G49	Social protection
		G52	Social security
		G55	Social support
	Flexibility	G17	Flexibility
Clear Aims	Well-Being and Quality of Life	G1	Ability to fulfil psychological needs
		G3	Address the basic human needs.
		M1	Cleanliness
		GM2	Comfort
		G22	Happiness
		G23	Health
		G27	Impact on quality of life
		GM3	Quality of life
		G38	Safety
		G39	Satisfaction of human needs
		G57	Sufficiency
		GM5	Well-being
	Social Harmony and Justice	G2	Access to social resources
		G10	Benefits to disadvantaged groups
		G12	Community stability
		G24	Human rights
		G26	Impact on local communities
		G27	Impact on quality of life
		G32	Labour rights
		G38	Safety
		GM4	Social equity
		G56	Social trust
		G57	Sufficiency
Continuous Advancement	Continuity	G1	Ability to fulfil psychological needs
		G2	Access to social resources
		G3	Address the basic human needs.
		G10	Benefits to disadvantaged groups
		M1	Cleanliness
		GM2	Comfort
		G12	Community stability
		G20	Future focus
		G22	Happiness
		G23	Health
		G24	Human rights
		G26	Impact on local communities
		G27	Impact on quality of life
		G32	Labour rights
		GM3	Quality of life
		G38	Safety
		G39	Satisfaction of human needs
		GM4	Social equity
		G43	Social asset
		G44	Social capital
		G51	Social resources
		G56	Social trust
		G57	Sufficiency
		GM5	Well-being

Referring to the definition of dimension, principle, criterion, indicator, and parameter described in the previous section, it can be concluded that the themes can be regarded as criteria and the new categories can be labelled as principles. The new categories can be positioned as the fundamental statements concerning a desired outcome related to social sustainability. The themes can be specified as the conditions that need to be assembled to comply with the principles of social sustainability. Defining the relationship of principles and criteria is based on what has been presented in Figure 1, Figure 3, and Tables 4-8, and also references discussing aspects and/ or frameworks of sustainability in general or social sustainability specifically [20-27]. The relationship between principles and criteria of instruments for measuring the social sustainability of a mosque is shown in Figure 3.

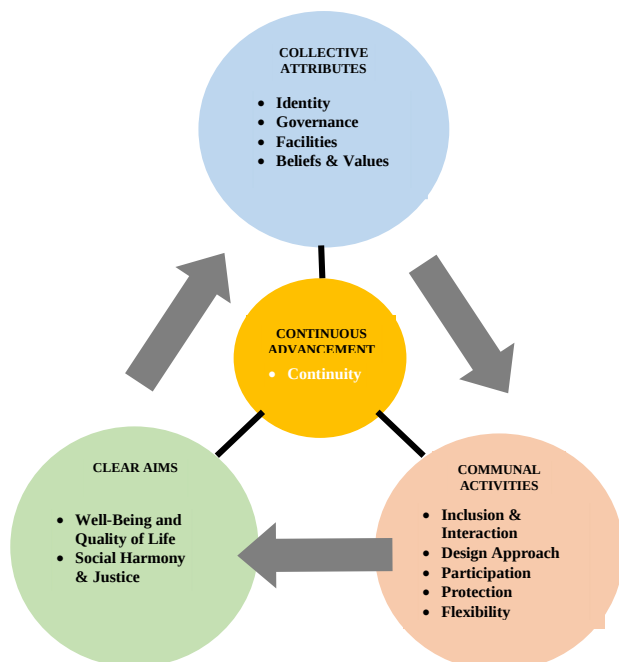


Fig. 3 The relationship between principles and criteria of instruments for measuring the social sustainability of a mosque

The three principles proposed by this study resemble the interconnected dimensions of urban social sustainability presented by Woodcraft [14]: 1) Amenities and Infrastructure; 2) Social and Cultural Life; and 3) Voice and Influence. Collective attributes in this study can be compared to the amenities and infrastructure dimension. Communal activities in this study can be associated with the social and cultural life dimension. Clear aims in this study can be paralleled to the voice and influence dimension. The principles and criteria defined in this study can be relevant not only for assessing the social sustainability of mosques but also that of other religious buildings, community centers, public spaces or broader facilities that share the common characteristics of accommodating communal activities, including religious ones, as described in several

references. [28-35] Nevertheless, it is important to emphasize that what may differentiate a mosque from other functions/ buildings/ facilities is the criterion of “Beliefs and Values”, containing what guides users (Muslims) in the daily activities and how they interact with other Muslims and/or Non-Muslims.

4. Conclusion

It can be concluded that the social dimension of sustainable development consists of four principles: 1) Collective Attributes, 2) Communal Activities, 3) Clear Aims, and 4) Continuous Advancement. Principle 1 (Collective Attributes) comprises four criteria: 1) identity, 2) governance, 3) facilities, and 4) beliefs and values. Principle 2 (Communal Activities) contains five criteria: 1) inclusion and interaction, 2) design approach, 3) participation, 4) protection, and 5) Flexibility. Principle 3 (Clear Aims) entails two criteria: 1) well-being and quality of life, and 2) social harmony and justice. Principle 4 (Continuous Advancement) involves one criterion: continuity.

These principles and criteria can be applied to formulate instruments for assessing the social sustainability of a mosque. These principles and criteria may also be compatible for assessing the social sustainability of other functions in the built environment or even more complex scopes, such as urban contexts, because they are derived from the analysis and synthesis involving not only mosques but also other kinds of public facilities. This framework can also be advantageous for evaluating and/or improving the social sustainability of mosques and other religious or communal facilities, not only in Indonesia but also in other countries in the world. The evaluation and/or improvement process of the social sustainability aspect of mosques may be useful for planning and designing the religious or communal buildings/ facilities in Muslim countries, including Indonesia, and formulating policies related to the buildings and/ or facilities. In terms of other-than-mosque facilities, the evaluation and/or improvement process of the social sustainability aspect may still be beneficial for planning and designing the religious or communal buildings/ facilities in Non-Muslim countries, and formulating policies related to the buildings and/ or facilities, but may need adjustment in the criterion of “Beliefs and Values”.

The framework formulated through systematic review and content analysis in this study offers applicability and comprehensiveness that have not been provided by other studies yet. The assumption of applicability and comprehensiveness of this framework is based on the argument that the references (whether they are used as guidelines or materials of review) entail different contexts and disciplines. The compatibility of the principles and criteria might reflect social inclusiveness as a prominent

feature of a mosque and its basis (Islam), and also as a vital part of social sustainability. It is important to note that principles and criteria are still in the conceptual domain. It will require further studies or elaborations for defining indicators and parameters of social sustainability that are more operational than principles and criteria.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper. The process and results of the review conducted in this study were not

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