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Designing for Everyday Social Connection in UAE Housing: Courtyard Principles, Vertical Living and the ESEO Framework

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Abstract

This article examines how residential spatial design can provide opportunities for voluntary everyday social encounters without compromising privacy and climatic comfort in the United Arab Emirates. A targeted narrative review and comparative conceptual synthesis draws on research concerning social sustainability, Gulf courtyard housing, and contemporary vertical residential buildings. The analysis identifies six interrelated architectural conditions: graduated privacy, encounter-supportive circulation, usable intermediate space, visibility without forced exposure, climate-responsive pedestrian continuity, and accessible shared destinations. The Everyday Social Encounter Opportunity (ESEO) framework organizes these conditions into a proposed evidence-based design-review protocol. A bounded documentary comparison with two UAE vertical-housing schemes discussed in earlier research shows that published information supports only partial assessment; missing drawings and access or climatic evidence prevent complete judgments. The contribution is a transparent proposal for examining architectural opportunities and documenting insufficient evidence, not a validated measure of social behavior or proof of superiority over existing social-sustainability frameworks. The study argues for culturally responsive, privacy-preserving approaches to housing design and specifies the evidence needed for future comparative validation.

Keywords

Social Sustainability, Housing Design, Everyday Social Encounters, Privacy, United Arab Emirates

1. Introduction

Residential architecture does more than provide shelter. It organizes the repeated

routes through which people leave home, meet neighbors, supervise children, receive visitors, reach shared facilities, and move between private and public life. These routine spatial sequences can create or remove opportunities for weak social ties, recognition, informal assistance, and a sense of belonging. Recent scholarship has therefore placed greater attention on the social dimension of housing sustainability, a dimension that has historically received less systematic treatment than environmental and economic performance (Alaie et al., 2022; Gurmu et al., 2022; Rostamnezhad & Thaheem, 2022).

The question is particularly relevant in the UAE. Housing development has moved through substantial changes in land use, density, building type, infrastructure, and mobility. Recent public-housing research documents a transition from predominantly single-family forms toward multi-family and vertical models, partly in response to land constraints and growing housing demand (Shareef & Ahmed, 2023). At the same time, UAE planning policy increasingly emphasizes vibrant communities, quality of life, accessibility, social cohesion, and the preservation of cultural and architectural legacies (Dubai Municipality, n.d.; UAE Government, 2024). These objectives make the social performance of residential architecture a practical planning concern rather than a purely theoretical issue.

International research suggests that built environments can afford opportunities for social interaction and belonging, but no single architectural feature can be treated as a direct cause of loneliness or social well-being (Bower et al., 2023). This distinction is important. A corridor, courtyard, lobby, garden, or lift does not automatically create community. Its contribution depends on location, accessibility, comfort, visibility, frequency of use, social norms, management, and residents' willingness to interact. Research on high-rise housing nevertheless shows that communal and circulation spaces can become meaningful sites of spontaneous encounter when their layouts and uses support everyday contact (Nguyen et al., 2024; Nguyen et al., 2026).

In the Arabian Gulf, the vernacular courtyard house provides a useful historical reference because domestic space was organized through a deliberate relationship among privacy, hospitality, climate, family activity, and intermediate space. Recent spatial research on Gulf courtyard houses confirms that socio-cultural factors were strongly embedded in domestic spatial configuration (Al-Mohannadi & Furlan, 2025). The value of this precedent is not that contemporary cities should reproduce historic houses literally. Rather, it raises a contemporary design question: which socially useful spatial principles can be translated into current residential forms, including vertical housing.

This article addresses that question through a structured narrative review and comparative conceptual synthesis. It does not claim to measure residents' loneliness, mental health, or actual frequency of social interaction in specific UAE buildings. Instead, it examines architectural opportunities for voluntary everyday encounter. The study proposes the Everyday Social Encounter Opportunity (ESEO) framework as a transparent way to assess residential spatial sequences while main-

taining a distinction between architectural affordance and observed social outcome.

Research Aim and Questions

The study aims to develop an evidence-based architectural framework for examining how residential spatial configuration can support voluntary everyday social encounters while preserving privacy, security and climatic comfort in the UAE. It addresses the following research questions:

RQ1. Which spatial characteristics are most consistently associated in the literature with opportunities for routine, voluntary social encounters in residential environments?

RQ2. Which socio-spatial principles of Gulf courtyard housing, particularly graduated privacy, intermediate space, climatic responsiveness and community orientation, remain relevant to contemporary residential design?

RQ3. How do contemporary vertical-housing configurations differ conceptually from courtyard and low-rise residential environments in the spatial sequence between dwelling and community?

RQ4. How can these findings be translated into a practical architectural framework for evaluating encounter opportunities in UAE residential design?

2. Literature Review

2.1. Social Sustainability in Housing

Social sustainability in housing is a broad concept concerned with the capacity of communities and built environments to support human well-being, equity, participation, social capital, safety, access and quality of life. Systematic reviews show that housing-related social sustainability spans functional, physical, perceptual, environmental and economic dimensions rather than a single design variable (Alaie et al., 2022). Similarly, reviews of construction-sector social sustainability identify community impacts and stakeholder well-being as important but inconsistently assessed components of project performance (Gurmu et al., 2022; Rostamnezhad & Thaheem, 2022).

For residential design, this breadth creates a methodological challenge. A project may perform well in privacy and security while providing few shared spaces; another may offer extensive communal amenities that are poorly located or rarely used. Therefore, the present study treats social interaction as one component of social sustainability rather than a complete substitute for it. This narrower focus makes it possible to examine spatial conditions in detail while acknowledging that affordability, equity, tenure, management, safety and cultural expectations also shape community life.

Recent UAE research has already established the importance of social sustainability in housing. Hamdoon and Ahmed (2023) assessed social sustainability in a mass-housing neighborhood in Al Ain, while Shareef and Ahmed (2023) examined pioneering vertical public-housing projects in Sharjah and Fujairah. Their

work identified issues including mixed use, interaction, accessibility, privacy, security, living-environment quality, user needs and participation. A later study involving Emirati participants reinforced the importance of culturally responsive privacy, social integration, accessibility and resident involvement in vertical public housing (Shareef & Ahmed, 2024). These studies provide an important base, but they also leave room for a more focused examination of the sequence of spaces through which everyday encounters become possible.

2.2. Built Environment, Social Interaction, and Loneliness

Evidence linking the built environment to social outcomes must be interpreted carefully. Bower et al. (2023), in a systematic review of 57 studies, concluded that the built environment can support practices that prevent loneliness, particularly by enabling social interaction and belonging, but found no single built-environment element that independently explains loneliness. This supports an affordance-based interpretation: architecture can make certain actions easier or more likely without determining whether they occur.

Research at the neighborhood scale similarly points to the importance of accessible destinations, walkability, public spaces and "third places". Veeroja et al. (2024) found that neighborhood social and built environments, including third places, are relevant to older adults' social interactions, although perceived social-environment factors were especially influential. This is useful for architectural research because it discourages physical determinism. Design can provide conditions for encounter, but social meaning emerges through use, perception, culture and repeated experience.

For this reason, the present manuscript avoids using loneliness as a direct architectural outcome. Instead, it uses the more defensible concept of encounter opportunity: the spatial possibility for residents to see, recognize, greet, pause with or briefly interact with others during normal daily routines. Such encounters may be modest, but repeated weak ties can contribute to familiarity and neighborhood belonging.

2.3. High-Rise Housing and Communal Space

High-rise living reorganizes social space vertically. Movement that might occur through a front yard, shaded lane, courtyard edge or neighborhood street can be transferred to internal corridors, lift lobbies, elevators, podiums, parking levels and controlled entrances. These spaces are often designed primarily for circulation, fire safety, access control and efficiency. Their social role may therefore be incidental rather than intentional.

Kim and Kim (2022) demonstrated that spatial configuration and the use of community facilities are relevant to interaction patterns in housing complexes. Nguyen et al. (2024) reported that spontaneous interaction in high-rise housing often occurs in common spaces close to the home and building, including corridors, lift lobbies and front yards. A subsequent study by Nguyen et al. (2026) fo-

cused specifically on indoor communal-space layout and showed why circulation and destination spaces should be analyzed together. The implication is not that corridors should become lounges, but that the geometry, visibility, width, adjacency and connection of everyday routes can influence whether residents merely pass through or have reasonable opportunities to pause and recognize others.

UAE vertical public-housing research reaches a related conclusion from a local perspective. Shareef and Ahmed (2023) found limitations in social interaction and communal opportunities in two pioneering vertical public-housing designs while also recognizing achievements in privacy, security and responsiveness to Emirati family needs. The central design problem is therefore a balance problem: increasing social opportunity without producing unwanted exposure, noise, surveillance or loss of domestic privacy.

2.4. Courtyard Housing, Privacy, and Gulf Spatial Culture

The courtyard house is important in Gulf architectural history because it integrated climatic adaptation and socio-cultural organization. The courtyard acted as an internal open space, while spatial layering helped regulate privacy, hospitality, family activity and movement. Recent analysis of vernacular courtyard houses across the Arabian Gulf emphasizes the relationship among spatial form, socio-cultural factors and systems of activity (Al-Mohannadi & Furlan, 2025).

Privacy in this context should not be understood as social isolation. Traditional domestic organization often separated guest reception from intimate family areas while still allowing social life to occur in controlled spaces. Intermediate elements and gradual transitions helped distinguish household, guest, neighborhood and public domains. This is conceptually relevant to contemporary multi-family housing because vertical buildings also require transitions between the dwelling and the wider community. The question is whether those transitions are spatially rich enough to support both privacy and optional encounter.

The courtyard itself should also not be romanticized. Historic forms reflected different household structures, gender norms, mobility patterns, technologies and climatic practices. Direct replication would be inappropriate. The transferable lesson is the use of layered thresholds, shaded intermediate spaces, legible social domains and environmental comfort to support a range of degrees of contact.

Social-scale transfer boundary. A traditional household courtyard or majlis chiefly mediates the relations of family members and invited guests; that intra-household/host-guest function cannot, by itself, demonstrate encounters among neighboring households. What can be transferred is the spatial principle of graded, privacy-preserving thresholds and climatically usable places to transition or pause. An inter-household opportunity arises only when these characteristics are located on spaces genuinely shared by separately occupied dwellings, with lawful common access, appropriate screening and resident choice. Therefore, a private courtyard is not counted as a neighborhood encounter destination, and a communal atrium, podium or sky garden is not assumed to work socially without confirming these

conditions (Al-Mohannadi & Furlan, 2025; Shareef & Ahmed, 2023).

2.5. UAE Policy Relevance

The topic aligns with current UAE planning priorities. Dubai Social Agenda 33 includes cohesive families, quality of life, housing, identity and social cohesion among its central concerns (UAE Government, 2024). The Dubai 2040 Urban Master Plan emphasizes vibrant and healthy communities, parks and open space, people-centered accessibility and protection of heritage and culturally significant places (Dubai Municipality, n.d.). These policy directions create a strong rationale for examining residential social infrastructure at the scale of buildings and neighborhoods.

Recent public initiatives also demonstrate continued attention to community gathering space. Community neighborhood councils and majalis have been advanced as settings for social cohesion, while 2026 initiatives include community spaces intended to strengthen interaction among neighborhood residents (Government of Dubai Media Office, 2026). Architectural research can complement such policy initiatives by asking how ordinary daily residential circulation—not only dedicated community buildings—can contribute to social connection.

3. Method

3.1. Research Design

This study uses a targeted narrative review and comparative conceptual analysis; it is not a systematic or scoping review. This design was selected because the research question concerns the integration of several bodies of knowledge—social sustainability, high-rise communal space, Gulf residential culture, privacy, and UAE housing policy—rather than the pooled statistical effect of a single intervention. No laboratory testing, resident survey, interview, or experimental manipulation was undertaken.

The review gives priority to peer-reviewed research published from 2022 to 2026 and uses earlier foundational sources only where necessary to clarify established concepts. Literature was identified through targeted searching and citation-led selection on academic publisher platforms, university research repositories, and scholarly indexes using combinations of terms including social sustainability, housing, residential architecture, high-rise housing, vertical housing, communal space, social interaction, courtyard house, privacy, Arabian Gulf, UAE, Emirati public housing, and built environment loneliness. Official UAE and Dubai sources were used only for policy context.

Review-source identification and search transparency. The historical review used selective searches of academic-publisher websites and university research repositories and citation-following, but a contemporaneous list of search interfaces, dated queries and retrieved records was not retained. It is consequently not possible to identify a particular scholarly index, such as Scopus or Web of Science, as having been searched systematically, or to provide an auditable count of retrieved/excluded records. Publisher platforms identifiable from the cited primary works include MDPI

(Social Sciences, Buildings, Heritage, Land), Springer Nature (Journal of Housing and the Built Environment), and Taylor & Francis (Cities & Health; Urban Policy and Research); the UAE University research publication repository provides an additional record for the UAE housing comparator. These are verified publication/access platforms, not a reconstructed search history. A representative, reproducible targeted query for the subject area is: ("vertical housing" OR "high-rise housing" OR "courtyard housing") AND ("social interaction" OR "social sustainability") AND (privacy OR "communal space") AND (UAE OR "Arabian Gulf"). It is supplied as an illustrative search strategy rather than falsely presented as a preserved historical query. The synthesis remains selective rather than systematic.

Sources were included when they contributed directly to at least one of four analytical domains: (a) social sustainability in housing or construction; (b) spatial conditions for social interaction in multi-family or high-rise housing; (c) Gulf courtyard-house spatial culture, privacy, or hospitality; and (d) UAE residential transition or planning priorities. Sources focused solely on structural engineering, energy performance, materials, or unrelated clinical outcomes were excluded from the conceptual synthesis.

3.2. Author Positionality

The author has lived and worked in the Arabian Gulf region for more than four decades, with professional experience related to architecture, construction and the built environment. This long-term regional familiarity provides contextual awareness of changes in residential form, privacy, climatic adaptation and community space. It is not treated as empirical evidence in this study; the analytical claims and the proposed ESEO framework are based on the published literature and policy sources included in the review.

3.3. Analytical Procedure

The cited sources were interpreted against the research questions and compared for their discussion of privacy, routine movement, intermediate space, visibility, thermal usability, and shared destinations. The resulting six domains are an author-proposed organizing scheme, not the output of a reproducible coding procedure. This was an author-led conceptual synthesis, not a preregistered or independently replicated coding exercise. No database export, full screening log, inter-coder agreement assessment, or exhaustive search record is available. Consequently, the six categories should be interpreted as provisional design-review propositions rather than systematically derived or empirically validated constructs.

Rationale and boundaries of the six ESEO domains. The proposed domains separate six architectural questions across the dwelling-to-community journey: (1) who controls access and exposure (privacy), (2) whether ordinary routes produce possible co-presence (circulation), (3) where stopping or transition is usable and permitted (intermediate space), (4) whether community activity can be seen with-

out revealing domestic interiors (visibility), (5) whether the route is usable under relevant climatic conditions (thermal continuity), and (6) which accessible activity generates repeated journeys (shared destinations). Circulation refers to route configuration and possible co-presence, even without a place to stop; intermediate space requires an identifiable and functionally usable pause/threshold area; a destination requires an accessible activity or facility that motivates use, whether or not it adjoins the circulation route. One location may serve multiple functions, but evidence of a corridor does not establish a usable intermediate space, and the presence of a room does not establish a shared destination without access and use conditions. The distinctions are explicit provisional coding rules, not validated independent constructs.

The framework is intentionally non-clinical. It does not assign a loneliness score and does not claim to predict friendship, cohesion, or mental health. It assesses whether architecture provides voluntary opportunities for everyday encounter. This distinction protects the analysis from causal overstatement and makes the framework suitable for plan review, comparative case analysis, and early design evaluation.

Evidence-to-domain traceability and reproducibility boundary. Table 1 identifies the source-level conceptual precedents and the remaining evidentiary gap for each ESEO domain. These mappings identify overlaps and candidate distinctions; they do not demonstrate that any domain is unique, that the review was exhaustive, or that a specific spatial feature causes social interaction. The framework remains a proposition requiring transparent application and external testing.

Table 1. Preliminary source-to-domain traceability and evidentiary limitations.

ESEO domain	Relevant conceptual precedents	What is supported/what remains untested
Graduated privacy	Shareef and Ahmed (2023, 2024); Al-Mohannadi and Furlan (2025)	Privacy is established in prior UAE and Gulf work; ESEO proposes inspection of spatial transitions, not a new privacy principle.
Encounter-supportive circulation	Shareef and Ahmed (2023); Hamdoon and Ahmed (2023)	Earlier work addresses social interaction and connectivity; corridor/lobby encounter potential remains an unvalidated proposition.
Usable intermediate space	Shareef and Ahmed (2023); Nguyen et al. (2024, 2026)	Communal-space provision is established; usable pause opportunities require case-level verification.
Visibility without forced exposure	Shareef and Ahmed (2023, 2024); Al-Mohannadi and Furlan (2025)	Privacy and visual access are related concepts, but the precise proposed combined condition lacks direct independent validation.
Climate-responsive pedestrian continuity	Al-Mohannadi and Furlan (2025); Shareef and Ahmed (2023)	Climatic design and access are known considerations; evidence for their combined role in voluntary encounter opportunities remains indirect.
Accessible shared destinations	Shareef and Ahmed (2023); Hamdoon and Ahmed (2023)	Accessibility and shared facilities are established; the proposed journey-based inspection has not been reliability-tested.

4. Comparative Conceptual Findings

4.1. From Layered Horizontal Transitions to Compressed Vertical Transitions

The most important conceptual difference identified in the synthesis concerns the sequence between dwelling and neighborhood. In courtyard and low-rise settings, movement may pass through several spatial layers before reaching the fully public realm. In vertical housing, the same transition can be compressed into a dwelling door, internal corridor, lift lobby, elevator, entrance lobby, parking area, and vehicle. Compression is not inherently negative; it can improve security, accessibility, land efficiency, and climatic protection. However, it can reduce the number and diversity of places in which optional, low-pressure encounters can occur.

The transition-sequence comparison is summarized in Table 2.

Table 2. Conceptual comparison of residential transition sequences.

Spatial stage	Courtyard/low-rise tendency	Vertical-housing tendency	Social design question
Dwelling edge	Porch, courtyard edge, entrance recess, front setback	Apartment door opening directly to corridor	Is there a comfortable threshold between private interior and shared circulation?
Immediate shared realm	Lane, small forecourt, courtyard-related edge	Corridor or lift lobby	Can residents pause without blocking circulation or feeling exposed?
Building/community transition	Street edge, shaded path, local open space	Ground-floor lobby, podium, controlled entrance	Does the transition support recognition and orientation, or only movement?
Daily mobility	Walking through neighborhood spaces	Lift to parking and car-dependent departure	Do routine trips pass through shared pedestrian spaces?
Shared destination	Majlis, local shop, mosque edge, courtyard, square	Amenity room, gym, pool, playground, retail	Are shared destinations connected to everyday routes and usable by different age groups?

4.2. Graduated Privacy

The literature consistently indicates that social opportunity should not be created by eliminating privacy. Gulf courtyard-house research demonstrates the importance of spatial gradation and culturally meaningful separation, while UAE vertical-housing studies show that residents value privacy and functional separation within contemporary units (Al-Mohannadi & Furlan, 2025; Shareef & Ahmed, 2024). The design implication is to create a sequence of domains rather than a binary private/public boundary. A successful shared space should allow residents to choose whether to participate, pass through, observe, or withdraw.

4.3. Encounter-Supportive Circulation

Circulation spaces are unavoidable and therefore have high potential as every-

day encounter settings. Research on high-rise housing identifies corridors, lift lobbies, and building entrances as locations where spontaneous contact occurs (Nguyen et al., 2024, 2026). Their social usefulness depends on more than floor area. Long, narrow, visually monotonous corridors may function efficiently while offering little reason to pause. By contrast, daylight, short visual distances, small widening points, seating near but not within the movement path, and connection to shared functions can turn circulation into a more humane transitional environment.

4.4. Intermediate Space

Intermediate space is the central bridge between the courtyard precedent and vertical housing. In traditional settings, semi-private and semi-public layers helped negotiate privacy, hospitality, climate, and neighborhood life. In contemporary buildings, equivalent roles may be performed by entrance alcoves, shared terraces, sky gardens, floor-level common rooms, shaded podium spaces, or small seating areas associated with lifts and stairs. The important characteristic is not the label of the space but its position between private dwelling and fully public realm.

4.5. Visibility without Forced Exposure

Visual connection can support recognition and informal awareness, but excessive visibility can undermine privacy. The ESEO approach therefore distinguishes visibility from exposure. Windows or openings toward shared spaces, transparent but screened lobbies, overlooking of children's play areas, and visually connected vertical gardens may support awareness of community activity. However, direct views into private interiors or unavoidable social surveillance should be avoided. This principle is particularly relevant in the UAE, where privacy remains an important cultural and residential design requirement.

4.6. Climate-Responsive Pedestrian Continuity

In hot-arid environments, social opportunity cannot be separated from thermal comfort. A theoretically walkable route may have little practical social value if it is exposed to intense heat for much of the year. The courtyard tradition linked social space with shade and environmental moderation. Contemporary equivalents include continuous shaded walkways, arcades, cooled or tempered transition zones, tree cover, protected crossings, and short walking distances between residential entrances and daily destinations. Dubai's current planning emphasis on people-centered accessibility and connected communities reinforces the relevance of this principle (Dubai Municipality, n.d.).

Peer-reviewed local evidence qualifies this climatic argument. Bande et al. (2021) examined district-level outdoor thermal comfort in Abu Dhabi and Al Ain through measurements and ENVI-met scenarios combining shading structures and vegetation. Their selected fully shaded scenario reduced the reported predicted mean vote (PMV) at 14:00 relative to baseline by approximately 1.0 in Abu

Dhabi and 0.7 in Al Ain; however, simulated PMV remained above 4 during peak hot hours in the study, signalling severe discomfort rather than acceptable outdoor conditions. The study also found that coastal humidity and inland-coastal microclimate differences affected relative intervention performance. Its findings concern two district configurations, not the residential routes of the projects evaluated here. Consequently, a shaded route in ESEO is an architectural candidate requiring time-specific heat, humidity, wind, radiant-exposure and local comfort evidence, not proof that a route is thermally comfortable or that social encounters will occur (Bande et al., 2021).

4.7. Accessible Shared Destinations

Shared destinations create reasons for repeated presence. International literature on third places and neighborhood interaction suggests that accessible everyday destinations can support social contact (Veeroja et al., 2024). Within residential developments, destinations may include children's play areas, small gardens, multipurpose rooms, prayer facilities, seating areas, local retail, mail or delivery zones, and community rooms. Their location matters: a rarely visited amenity at the edge of a development may create fewer routine encounters than a modest shared function placed along an everyday path.

5. The Everyday Social Encounter Opportunity (ESEO) Framework

Based on the synthesis, the ESEO framework is proposed as a practical architectural assessment structure. It is intended for comparative research and design review rather than clinical or behavioral diagnosis. Each domain can be rated descriptively—for example, limited, moderate, or strong—using drawings, site observations, publicly available project information, and documented photographs. Numerical scoring may be developed in future validation studies, but this article deliberately avoids presenting unvalidated weights.

Two-dimensional reporting rule. The terms "limited", "moderate" and "strong" concern the prospective adequacy of a documented architectural affordance, and must never be used as measures of observed social interaction or evidence quality; numerical thresholds for these qualitative categories have not been validated. The separate documentary statuses "supports", "contradicts" and "cannot establish" indicate whether the identified record backs, negates, or is insufficient to adjudicate a specific proposed condition. These are not interchangeable scales: a source may support the existence of ground-floor shops but cannot establish their social effectiveness or route accessibility; a documented access prohibition would contradict an accessible-destination proposition; and absent plans yield "cannot establish", not "limited". If the minimum observations are not available, no limited/moderate/strong judgement is assigned. The comparison below reports documentary status and only appropriately bounded observations.

The six assessment domains are specified in **Table 3**.

Table 3. Proposed ESEO framework for architectural assessment.

ESEO domain	Architectural indicators	Evidence that can be reviewed	Interpretive question
1. Graduated privacy	Number and clarity of private, semi-private, semi-public, and public layers; screening; guest/family separation	Plans, sections, access diagrams	Can residents control the degree of social exposure?
2. Encounter-supportive circulation	Corridor/lobby geometry; daylight; pause points; stair visibility; route overlap	Floor plans, circulation diagrams, photographs	Do necessary daily routes permit brief voluntary encounters?
3. Intermediate space	Thresholds, shared terraces, sky gardens, entrance recesses, podium spaces	Plans, sections, amenity schedules	Are there usable spaces between dwelling and fully public realm?
4. Visibility without exposure	Overlooking, visual permeability, screening, sightlines to shared areas	Plans, sections, facade information	Can residents perceive community activity without loss of privacy?
5. Climate-responsive pedestrian continuity	Shade, covered routes, thermal protection, route length, landscape, crossings	Master plans, sections, climate strategies	Can residents comfortably walk through shared space for routine needs?
6. Accessible shared destinations	Play, seating, garden, community, prayer, retail and service spaces on everyday routes	Amenity plans, land-use plans	Are there repeated reasons for residents to occupy shared space?

Evidence Sufficiency and Falsifiability Protocol

To prevent a favorable design description from being mistaken for a verified encounter opportunity, each ESEO domain requires a traceable architectural observation. Reviewers should document the plan, section, photograph or access rule supporting the observation, identify missing evidence, and record whether an apparent opportunity is negated by privacy, access or thermal constraints. An absent drawing is coded as insufficient evidence, not as absence of the feature. These rules are proposed for subsequent application; they have not been tested for inter-rater reliability.

The minimum evidence requirements and disconfirming observations are summarized in Table 4.

Table 4. Evidence sufficiency and disconfirming conditions for the six ESEO domains.

Domain	Minimum documentary observation	Potential disconfirming condition
Graduated privacy	Document sequence of access-controlled or screened thresholds	Direct exposure of private doors to heavily shared routes without a usable choice of separation
Encounter-supportive circulation	Trace everyday routes and identify lawful, unobstructed pause points	Only narrow or security-restricted circulation without usable stopping space
Usable intermediate space	Locate accessible semi-shared areas and record functional use conditions	Nominal amenity inaccessible to the target residents or unusable for stopping

Continued

Visibility without forced exposure	Document sightlines and screening from shared to private space	Contact depends on overlooking domestic interiors or removing privacy
Climate-responsive continuity	Trace sheltered connections to shared settings and identify environmental exposure	Shared destination depends on an unprotected route under relevant hot-season conditions
Accessible shared destinations	Identify amenities on routine routes and their actual access conditions	Amenities exist on paper but access rules or spatial separation preclude routine use

Decision rule: no overall ESEO grade is assigned when a domain lacks adequate documentation. Evidence of one favorable feature cannot cancel a demonstrated privacy or access failure elsewhere. The proposed disconfirming conditions are methodological safeguards, not empirically calibrated thresholds. A future case study must report domain-by-domain observations, counterexamples and disagreements before claiming repeatability.

6. Applying the Framework to UAE Residential Typologies

The framework can be applied without collecting new human-subject data by comparing documented residential typologies. A robust future application could select one or more vernacular courtyard precedents, a contemporary low-rise Emirati housing neighborhood, and one or more vertical public-housing projects with sufficiently documented plans. The purpose would not be to rank historical housing as "good" and vertical housing as "bad." Instead, the analysis would identify where each typology locates privacy transitions, shared destinations, climate protection, and encounter opportunities.

Existing published material makes Diba Al Hosn and Al Ghurfa relevant contemporary examples because their social-sustainability characteristics have already been documented in peer-reviewed UAE research (Shareef & Ahmed, 2023, 2024). Gulf courtyard houses documented by Al-Mohannadi and Furlan (2025) provide a regional vernacular reference. A subsequent empirical paper could apply ESEO to these documented plans using a transparent coding protocol and, if desired, space-syntax measures. Such a study would remain non-experimental while producing reproducible architectural evidence.

Documentary Comparison and Incremental-Evidence Test

This bounded comparison uses published descriptions of Diba Al Hosn and Al Ghurfa in Shareef and Ahmed (2023), rather than independent access to verified construction drawings or residents. It tests what the proposed ESEO protocol can and cannot determine from the published record; it is not a validation study, a field evaluation, or evidence of residents' actual encounters.

The 2023 comparator already evaluated both UAE projects against eight social-sustainability aspects, including social interaction, accessibility, security, privacy, and quality of living environment. Therefore, identifying absent or limited com-

munal facilities is not an original ESEO finding. ESEO can only claim an additional diagnostic contribution if it yields a distinct, traceable judgment under a defined privacy-encounter-climate rule.

For Diba Al Hosn and Al Ghurfa, the available published descriptions indicate differences in ground-floor functions and shared amenities. They do not, on their own, document every threshold, line of sight, pedestrian exposure, climatic condition, or resident use pattern required for a complete six-domain ESEO assessment. The appropriate ESEO output is consequently "partially assessable; remaining domains indeterminate," not a numerical rating or a positive/negative conclusion.

Project-specific findings from the published source. Shareef and Ahmed (2023, **Figure 3** and **Table 4**) report that Diba Al Hosn has two ground-level entrances, a waiting area, shops, parking and services, whereas Al Ghurfa contains parking, an entrance lobby and services but lacks ground-floor mixed-use areas (Shareef & Ahmed, 2023, **Figure 5** and **Table 4**). The reported shops at Diba Al Hosn establish a potential on-site activity destination (Domain 6), whereas no corresponding commercial ground-floor function is documented for Al Ghurfa. These observations do not verify that shops are open, accessible to all residents, linked to usual pedestrian routes, or socially used. The authors also describe privacy-related spatial provisions in both schemes, which support discussion of Domain 1 at household level but do not fully establish privacy-controlled inter-household transitions. Both projects contain circulation/lobby arrangements, but the existence of a lobby alone cannot establish Domain 2 encounter-supportive pause opportunities. The earlier study reports limited or absent recreational and dedicated social functions in the projects; this identifies potential limitations to Domains 3 and 6, rather than establishing actual resident behavior. The precise evidence boundaries are itemised in **Table 5**.

Table 5. ESEO domain-by-domain assessment of documentary evidence for the two UAE schemes, based on the externally published Fig. 3 and Fig. 5 and **Table 4** of Shareef and Ahmed (2023). Documentary status does not imply measured social performance.

ESEO domain	Diba Al Hosn—published description	Al Ghurfa—published description	Documentary interpretation
1. Graduated privacy	Household guest/family/service zoning reported	Privacy-oriented internal zoning reported	Supports household-level separation; cannot establish complete inter-household threshold sequence in either project
2. Encounter-supportive circulation	Ground-floor entrances and waiting area documented	Entrance lobby and vertical circulation documented	Supports route/lobby existence; cannot establish usable pause points, route overlap, or resident encounters
3. Usable intermediate space	Waiting area identified; usability/access rules not reported	No specific shared recreational stopping area established	Cannot establish functional semi-shared stopping-space adequacy in either project

Continued

4. Visibility without forced exposure	No sufficient project-specific shared-to-private sightline evidence	No sufficient project-specific shared-to-private sightline evidence	Cannot establish privacy-preserving visual connection in either project
5. Climate-responsive pedestrian continuity	No complete route-specific outdoor comfort or thermal evidence	No complete route-specific outdoor comfort or thermal evidence	Cannot establish hot-season usability in either project
6. Accessible shared destinations	Ground-floor shops and services reported; recreation limited	Parking, lobby and services; no mixed-use ground-floor areas reported	Supports difference in available functions, but cannot establish resident access, use or social outcomes

Source: Shareef and Ahmed (2023), Social Sciences, 12(9), 513, https://doi.org/10.3390/socsci12090513. The publisher's article includes floor-plan figures and a project-comparison table; no numerical ESEO scores have been derived here.

Incremental-evidence result: the published case comparison confirms that ESEO can structure missing-evidence requests, but it does not demonstrate superior diagnostic performance over Shareef and Ahmed (2023). A defensible future test requires the same independently documented drawings to be evaluated with both frameworks, predefined decision rules, blinded raters, disagreement reporting, and an explicit analysis of whether ESEO identifies consequential distinctions absent from the comparator.

7. Discussion

7.1. Social Connection Should Be Designed as Choice, Not Obligation

The synthesis suggests that socially responsive housing should not maximize interaction indiscriminately. Residents differ in age, family structure, culture, work schedule, personality, and desired level of contact. A socially sustainable building therefore needs both connection and retreat. The most useful design objective is optionality: residents should encounter others naturally during ordinary routines but retain the ability to withdraw without penalty. This principle aligns well with Gulf traditions of layered privacy and hospitality.

7.2. The Courtyard Is a Principle, Not a Shape

One of the risks in discussions of vernacular architecture is formal imitation. The social value of the courtyard does not depend only on a rectangular open space surrounded by rooms. Its deeper contribution lies in centrality, shade, visual connection, controlled access, multi-purpose use, and mediation between private rooms. These properties can be reinterpreted vertically through atria, sky courts, shared terraces, clustered floor plans, shaded podiums, or vertically distributed gardens. The research implication is to compare functions and spatial relationships rather than architectural appearance.

7.3. Vertical Housing Requires a Social Section, Not Only a Social Ground Floor

Many high-rise developments concentrate communal amenities at ground or podium level. The literature suggests that proximity to the dwelling matters for spontaneous encounter. A socially responsive vertical building may therefore need a distributed hierarchy of shared spaces: small floor- or cluster-level spaces close to homes, larger building-level spaces, and neighborhood-level destinations. This creates a vertical equivalent of the graduated social hierarchy found in horizontal neighborhoods.

7.4. Construction and Development Implications

The framework also has implications for construction and development practice. Social sustainability is often considered late, after density, unit yield, parking, structure, services, and cost have already fixed the spatial organization. Incorporating ESEO domains during briefing and concept design would allow project teams to test social performance alongside technical requirements. This does not necessarily require expensive amenities. Small changes in circulation geometry, threshold depth, shade continuity, seating placement, stair visibility, and the location of shared functions may have significant spatial effects without major increases in built area.

For housing authorities and developers, the framework can function as a design-review checklist. For architects, it can support option comparison. For facility managers, it can identify spaces that need management or programming rather than physical reconstruction. For researchers, it offers a set of observable variables that can later be tested against resident perceptions and behavior.

Distinction from prior UAE housing assessments. Existing UAE housing studies have evaluated social sustainability, resident requirements, privacy, accessibility, and the performance of particular public-housing schemes. The narrower proposed contribution here is to organize the dwelling-to-community transition as an auditable sequence of spatial opportunities for voluntary encounter, while treating privacy and climatic usability as necessary constraints rather than benefits that can be traded against social exposure. This is a conceptual distinction, not evidence that ESEO outperforms existing frameworks. A direct comparative application using published plans, independently coded indicators, and agreement between assessors is still needed to establish its practical incremental value.

7.5. Comparative Novelty Boundary and Operational Use

Direct comparison with Nguyen et al. (2026). Nguyen and colleagues combined floor-plan/space-syntax analysis with resident interviews in four high-rise complexes in Hanoi, identifying the importance of accessibility, visibility, flexibility, corridors, and transitional spaces for social interaction. Accordingly, ESEO cannot claim these spatial relationships or their assessment as original discoveries. Its distinct proposal is a privacy- and climate-constrained screening protocol for po-

tential voluntary encounters in UAE housing, not a demonstrated predictor of residents' behaviour. Unlike the empirical Nguyen study, ESEO has not tested associations with observed interactions. The proposed protocol is therefore a conceptual design-audit instrument requiring future comparative application, inter-rater assessment, and resident-level validation.

Prior UAE studies have already advanced social-sustainability principles and examined resident perspectives on vertical public housing (Hamdoon & Ahmed, 2023; Shareef & Ahmed, 2023, 2024). ESEO therefore does not claim novelty in privacy, circulation, intermediate space, visibility, climatic comfort, or shared amenities considered separately. Its narrower proposed contribution is a spatially inspectable, non-compensatory sequence of questions about voluntary encounter opportunity: whether routine routes expose residents to usable shared settings, whether these settings remain climatically viable, and whether participation is possible without sacrificing privacy. This is a conceptual proposition, not an empirically established superiority claim.

For application, reviewers should examine drawings, circulation paths, thresholds, shaded connections, access rules and amenity distribution together, and record a short evidence statement for each domain. A missing domain should not be silently compensated by an unrelated amenity. No numerical weighting, score, threshold or causal effect is asserted. Agreement between independent assessors and association with observed encounters remain questions for future validation.

The contribution and its novelty boundaries relative to previous UAE housing studies are compared in Table 6.

Table 6. Comparison of prior UAE housing research and the narrower ESEO proposal.

Prior research	Established contribution	ESEO distinction requiring testing
Hamdoon and Ahmed (2023)	Social-sustainability principles at neighborhood scale in Al Ain	Dwelling-to-shared-setting architectural inspection rather than neighborhood-level appraisal
Shareef and Ahmed (2023)	Eight social-sustainability principles applied to UAE vertical public-housing cases	Focused test of voluntary encounter affordances, with privacy and climatic viability as explicit constraints
Shareef and Ahmed (2024)	Resident-informed assessment of vertical public-housing requirements	Architectural documentation-based assessment, explicitly not a substitute for resident evidence

8. Contribution to Knowledge

This article proposes three conceptual contributions, whose incremental value has not yet been demonstrated through independent application. First, it narrows the broad discussion of social sustainability to the architecturally observable concept of everyday encounter opportunity, reducing the risk of claiming that design directly causes psychological outcomes. Second, it connects recent international high-rise research with Gulf courtyard-house spatial culture and contemporary UAE vertical-housing studies. Third, it proposes the ESEO framework as a bridge between cultural interpretation and practical architectural assessment.

The framework also reframes the traditional-versus-modern debate. The rele-

vant issue is not architectural nostalgia. The research question is whether contemporary residential systems preserve or reinvent spatial opportunities that allow residents to move gradually between privacy and community. This makes the framework applicable to future high-density development rather than only to heritage analysis.

Interpretive boundary. ESEO is a proposed design-review framework, not a validated scale or a causal model of resident behaviour. The presence of a courtyard, lobby, or shared amenity cannot establish actual social connection. Assessment requires explicit documentation of spatial access, privacy controls, environmental usability, and the availability of voluntary stopping places; resident experience, management practices, and cultural preferences remain potential moderators. No quantitative ranking, causal effect, or transferability across housing groups is inferred from the present synthesis.

8.1. Illustrative Architectural Inspection Protocol

A prospective design-review application can follow four steps: (1) define the dwelling-to-shared-destination journey and the residential population for which access is assessed; (2) annotate six domain-specific conditions on plans and sections; (3) record for each condition whether the documentation supports, contradicts, or cannot establish the proposed opportunity, with a drawing or source reference; and (4) compare alternative schemes narratively, highlighting privacy and climate trade-offs rather than collapsing them into an unvalidated total score. This protocol is proposed for future testing; it has not been applied as a documented empirical study in this article.

8.2. Source-Verification and Evidence Limitations

The closest UAE comparators provide substantial prior work rather than an empty research gap: Shareef and Ahmed (2023) proposed social-sustainability indicators for vertical public housing; Shareef and Ahmed (2024) tested resident-informed priorities using interviews and digital participation; and Hamdoon and Ahmed (2023) assessed neighborhood-scale indicators with design and spatial analyses. The present ESEO contribution is consequently limited to a proposed, non-compensatory building-scale audit of opportunities for voluntary encounter. The framework has not yet been shown to yield more informative or reproducible decisions than these existing approaches. A full reference-by-reference metadata audit and independent application to common floor plans remain future work; neither has been represented here as completed.

9. Limitations and Future Research

This study is a conceptual review and does not provide direct behavioral evidence from residents. It therefore cannot establish that a particular housing form increases or decreases social interaction, loneliness, well-being, or community cohesion. The ESEO framework evaluates architectural affordances, not realized so-

cial outcomes.

The review is structured but not a registered systematic review or meta-analysis. It integrates recent peer-reviewed studies and official policy sources selected for relevance to the research questions. Future work could conduct a database-based systematic review with a preregistered protocol and formal quality appraisal.

The ESEO domains have not yet been psychometrically or behaviorally validated, and no weighting system is proposed. Future studies could test inter-rater reliability among architects, compare ESEO ratings with space-syntax metrics, and examine associations with observed use or resident perceptions. Such work could remain non-laboratory and could use archival plans, systematic observation, or secondary datasets.

Finally, the UAE contains diverse residential populations and housing markets. Emirati public housing, private villas, expatriate apartment towers, gated communities, and mixed-use developments should not be treated as one social context. Future comparative studies should clearly define the population and tenure context of each case.

10. Conclusion

The transition from courtyard and low-rise residential environments to contemporary vertical living is not simply a change in building height. It changes the sequence of spaces through which residents move between home and community. Recent research in the UAE and internationally shows that privacy, communal space, circulation, accessibility, and social sustainability are all relevant to this transition.

The evidence does not justify the claim that high-rise housing inherently causes loneliness or that traditional housing automatically creates stronger communities. A more defensible conclusion is that architecture structures opportunities. It can provide—or fail to provide—places where residents repeatedly see one another, exchange brief greetings, supervise shared activity, or participate in community life.

The proposed ESEO framework identifies six conditions for examining these opportunities: graduated privacy, encounter-supportive circulation, usable intermediate space, visibility without forced exposure, climate-responsive pedestrian continuity, and accessible shared destinations. Together, these principles offer a way to translate socially valuable lessons from Gulf residential traditions into contemporary housing without copying historical form.

For the UAE, this approach is timely because current planning and social agendas emphasize quality of life, cohesive communities, cultural continuity, and people-centered urban development. Future residential architecture can respond to these goals by treating human connection as a design consideration from the earliest stages of planning and construction. The central challenge is not to force interaction, but to make everyday connection possible.

AI-Assisted Tools Disclosure

AI-assisted tools were used in manuscript drafting, language editing, and organization. The author retained responsibility for the research questions, conceptual framework, source selection and interpretation, scientific judgments, and the accuracy of the final manuscript. AI-generated text was not treated as empirical evidence.

Ethics

Ethical approval was not required because the study is based exclusively on published literature and publicly available policy documents and involved no human participants or personal data.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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