original research article
UDC xxx

admission date 03 11 2025
approval date 16 12 2025

VALUE-BASED PROGRAMMING FOR SUSTAINABLE ELDERLY HOUSING: INSIGHTS FROM THE SPASCAPES FRAMEWORK

ABSTRACT

The demographic shift toward aging societies demands innovative methodologies for designing sustainable and user-oriented elderly housing. This Perspective article introduces a value-based programming approach grounded in the spascapes framework, developed through research on spa settlements. Historically, spa settlements combined health, leisure, and community, offering spatial models that resonate with contemporary needs of aging populations. The spascapes framework identifies six interrelated landscape dimensions (hydrothermal, therapeutic, cultural-historical, urban, ecological, and recreational) that together define holistic environments of care and wellbeing. By translating these dimensions into a value-based programming matrix, this article proposes a structured methodology for architectural programming that aligns user values with design decisions. Each dimension is reframed as a core value (e.g., health, wellbeing, belonging, accessibility, sustainability, and social interaction), linked to specific design implications and measurable indicators. This approach not only provides a heuristic tool for developing adaptable, inclusive, and sustainable housing but also bridges heritage-based spatial knowledge with contemporary architectural practice. By integrating spascapes into programming, spa settlements can be reinterpreted as prototypes for sustainable elderly living, offering lessons for future housing policies, community models, and interdisciplinary educational practices.

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KEY WORDS
AGING SOCIETIES
ELDERLY HOUSING
ARCHITECTURAL PROGRAMMING
VALUE-BASED DESIGN SPASCAPES

1. INTRODUCTION

1.1. Aging, Sustainability, and the Need for New Housing Models

The demographic shift towards aging societies represents one of the most profound structural transformations in Europe. According to Eurostat's (2023) *Ageing Europe* report, the proportion of people aged 65 and above will continue to increase substantially, reshaping demands on housing, urban infrastructure, and social services. These dynamics are recognized at the highest policy levels. The European Commission's (2021) *Green Paper on Ageing* frames demographic change as a societal challenge that requires innovative housing solutions, highlighting the need for adaptable dwellings, smart homes, and multi-generational living models to prevent isolation and support independence. Urban policy frameworks further stress the centrality of age-inclusive development. The New Leipzig Charter (European Commission, 2020) calls for transformative urban approaches that ensure the inclusivity of all generations, while the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA, established in 2011) (European Commission, 2015) emphasizes digital and environmental adaptation as critical enablers of sustainable aging. Complementing these, the *Age-friendly Environments in Europe* handbook (WHO & European Commission, 2017) provides detailed domains for policy action - including housing, outdoor environments, and mobility - anchored in universal design and aging-in-place strategies. At the intersection of sustainability and demographic change, the UNECE (2020) Policy Brief on Ageing focuses on sustainable and smart cities, identifying housing, public space, and mobility as core priorities. Legal frameworks such as Article 31 of the European Social Charter (Kenna, 2024) establish the right to adequate housing as a binding obligation, explicitly extending protection to elderly persons. Meanwhile, sectoral reports such as the Housing Europe (2021) Observatory's *Ageing Well at Home* document the practical challenges housing providers face in adapting both dwellings and services to aging populations.

Despite this robust policy landscape, significant gaps persist. Research highlights fragmentation between housing, health, and social care sectors (Houben, 2001) and uneven territorial responses across regions (European Parliament, 2013). Studies of age-friendly cities demonstrate the potential of municipalities as "social laboratories" (Green, 2013), yet also reveal the difficulties of scaling up such initiatives. From the perspective of architecture

and urbanism, a critical gap emerges: while policy documents articulate *what* needs to be achieved, they seldom provide methodological tools for translating values such as health, dignity, and community into concrete spatial and design decisions. The lack of frameworks that systematically connect user values with programming and design outcomes limits the ability to anticipate and shape environments that genuinely support sustainable aging. Addressing this methodological gap is essential for developing housing models that are not only technically adaptable and environmentally sustainable, but also deeply user-oriented and responsive to the lived realities of older populations.

1.2. Paper Outline

Building on the identified policy and research gap - namely, the lack of methodological tools that systematically translate user values into architectural and urban design decisions - this paper introduces *spascapes* as an innovative framework to address the challenges of sustainable elderly housing. Derived from ongoing research on spa settlements (Milovanovic et al, 2025), *spascapes* integrates six interrelated landscape dimensions: hydrothermal, therapeutic, cultural-historical, urban, ecological, and recreational. These dimensions represent not only the environmental and spatial characteristics of spa settlements but also a set of values that can inform future-oriented housing solutions for aging populations. The central aim of this paper is to demonstrate how the *spascapes* framework can be operationalized through value-based architectural programming. By reframing each of the six spascapes dimensions as a core value - health, wellbeing, identity, accessibility, sustainability, and social interaction - this study proposes a programming matrix that connects abstract values with tangible design implications and measurable indicators. In doing so, it offers a heuristic tool that bridges the gap between policy aspirations and design practice, enabling more user-centered, adaptable, and sustainable housing models for the elderly.

The paper is structured as follows. First, it revisits the historical role of spa settlements as spatial laboratories for health and community living. Second, it outlines the conceptual framework of *spascapes* and its six landscape dimensions. Third, it introduces the value-based programming matrix as a methodological contribution, illustrating how values can be translated into design implications for elderly housing. Finally, the paper discusses broader implications for architectural education, participatory design, and policy, positioning spa settlements as prototypes for reimagining sustainable housing futures for aging societies.

2. SPA SETTLEMENTS AS SPATIAL LABORATORIES

Spa settlements represent unique spatial laboratories where the intersections of health, heritage, and community life unfold across multiple scales. Historically developed as destinations for therapy, regeneration, and social interaction, these settlements embody a distinctive profile that combines environmental assets with social and cultural dimensions. In many countries with a socialist legacy, spa settlements continue to function as primary destinations for elderly populations, offering a concentration of health services, affordable accommodation, and familiar social environments. This demographic profile reinforces their role as living observatories, where the everyday practices and spatial needs of older citizens are not abstracted but visibly enacted in the urban fabric. At the same time, spa settlements constitute critical eco-social environments. They integrate natural resources (thermal and mineral waters, forests, landscapes) with built infrastructure and public space typologies, producing spatial patterns where therapeutic, cultural, and social functions converge. As such, they form observatory frameworks for understanding how ecological sensitivity, social care, and community-based living can be spatially mediated. This dual nature, (1) as elderly-oriented environments and (2) as eco-social contexts, positions spa settlements as critical laboratories for decoding the values that can be anticipated in architectural and urban design processes for sustainable housing futures.

The research literature underscores this multidimensional role. Studies on adaptive reuse and sustainable urban development highlight the innovative potential of European historic spa towns, particularly in addressing abandoned infrastructures and promoting place-based strategies (Fabi, Vettori, & Faroldi, 2021). From an economic perspective, spa destinations have been evaluated for their competitiveness and resilience, with studies emphasizing their capacity to adapt to crises and regional disparities (Bakucz, Pótó, & Köbli, 2016). Equally important are the social and cultural dimensions. Research in Hungary has linked spa towns to quality-of-life indicators, community well-being, and service provision for residents (Michalkó et al, 2021), while the HERA project on *The European Spa as a Transnational Public Space* (2019–2022) has framed spas as metaphors of mobility, exchange, and European integration. Geographic studies of therapeutic landscapes (Foley, Wheeler & Kearns, 2011) further reinforce the notion that spa environments carry contested but powerful meanings of health and place. Planning-oriented research illustrates how geological constraints, land use patterns, and development control mechanisms shape the evolution of spa towns (Gocmez et al, 2006; Papageorgiou & Beriatos, 2011). Finally, case studies such as Mórahalom in Hungary reveal the dynamic

potential of spa settlements as drivers of regional development and socio-economic transformation (Martyn, 2015). Taken together, these contributions demonstrate that spa settlements are more than tourist destinations or heritage landscapes: they are observatory environments where spatial, ecological, and social values converge. This makes them particularly valuable for architectural and urban research that seeks to derive principles for sustainable, elderly-oriented housing. By decoding their urban patterns and lived practices, spa settlements can serve as critical reference frameworks for developing value-based methodologies in architectural programming.

3. METHODS AND MATERIALS

This Perspective article builds upon a dual foundation. On one hand, it draws from the experiential framework of doctoral dissertation that investigates the role of architectural programming methodology in shaping spatial morphology (Milovanovic, 2022). On the other, it incorporates insights from broader research project SPATTERN dedicated to decoding urban patterns in spa settlements through the lens of *spascapes* as environmentally sensitive spatial constructs (Milovanovic et al, 2025). Together, these two strands enable the article to advance a conceptual framework that links theoretical, methodological, and applied perspectives, highlighting how programming and pattern-based analysis can jointly inform sustainable and user-oriented housing models for aging populations.

3.1. Value-based Programming Framework

Value-based programming in architecture represents a methodological shift from traditional problem-definition approaches towards frameworks that explicitly anchor design decisions in articulated values and their measurable indicators. While architectural programming historically emerged as a process of systematically defining needs and translating them into spatial requirements (Pena & Fock, 1969; Preiser, 1978; Sanoff, 1977), value-based programming emphasizes the prioritization of values as the primary drivers of design outcomes. This shift reflects broader debates in design theory concerning the handling of “wicked problems” in planning and architecture (Rittel & Weber, 1973), where complex societal needs cannot be addressed solely through technical specifications, but demand iterative frameworks that reconcile diverse stakeholder perspectives.

In this framework, values are not treated as abstract ideals but are systematically operationalized through the formulation of indicators. Indicators function as mediators between the conceptual and the tangible: they provide measurable or observable criteria through which values can be embedded in the design process (Preiser, 1983; Robinson & Weeks, 1983). For instance, a value such as "social wellbeing" may be linked to indicators concerning accessibility of communal facilities, frequency of social interactions, or the adaptability of shared spaces. This relational construction in-between value and indicator enables architectural programming to move beyond prescriptive checklists toward reflexive, participatory, and evidence-based design methods (Schön, 1984; Salama, 2017). Accordingly, the outcome is not a fixed set of requirements, but a dynamic and negotiable framework in which values guide design objectives and indicators provide the means to evaluate and iterate them. Such an approach reinforces the adaptability of the design process while ensuring that spatial morphology reflects user-centered and socio-ecologically grounded priorities (Ristić Trajković, Milovanović, & Nikezić, 2021).

3.2. Spascapes Dimensions

The six interrelated landscape dimensions that constitute the *spascapes* framework were derived from the SPATTERN project Compendium Development (Milovanović et al, 2025), where spa settlements were systematically examined through the lens of three overarching dimensions of urbanization: material transformation, territorial regulation, and everyday life. Each of these dimensions was further articulated through six thematic clusters that together captured the complexity of spa settlement development. It was through this multifaceted analytical process that the six *spascapes* dimensions - hydrothermal, therapeutic, cultural-historical, urban, ecological, and recreational - were identified. In the construct of *spascapes*, these dimensions now serve as the conceptual backbone for decoding values that can subsequently be operationalized within architectural programming and design processes. The concept of *spascapes* thus provides an integrative spatial framework composed of six interrelated landscape dimensions: hydrothermal, therapeutic, cultural-historical, urban, ecological, and recreational. Each of these layers functions as a distinct entity with specific spatial, functional, and symbolic qualities, while simultaneously intersecting with the others to form a multilayered palimpsest of landscape and settlement organization.

Methodologically, these dimensions are not treated as isolated categories but as broader matrices of values that articulate the different aspects of spa environments. They encompass natural foundations (hydrothermal resources,

ecosystems), cultural-historical layers (heritage, traditions), urban structures (built fabric, infrastructures), and socio-experiential components (therapeutic practices, recreational patterns). Their analytical strength lies in enabling the readability of values in space - both tangible and intangible - which can later be operationalized through indicators. In this respect, the spascapes dimensions can be understood as ontological value fields: they define the underlying logics of spa settlement organization while offering a conceptual framework for anticipating values relevant to design and planning. This provides a methodological foundation for extracting and systematizing values that will subsequently be linked to indicators in the results and discussion phases.

3.3. Intertwining Value-based Programming Framework with Spascapes Dimensions

The next methodological step lies in intertwining the Value-Based Programming Framework (Milovanović, 2022) with the six dimensions of spascapes (Milovanović et al, 2025). Within this research framework, the spascapes dimensions function as spatial carriers of values. Each of the six dimensions corresponds to a specific set of value categories - for example, (1) hydrothermal landscapes encapsulate values of natural resource use and atmospheric quality, (2) cultural-historical landscapes articulate values of identity and continuity, while (3) urban landscapes embody values of functional organization and accessibility. Through the lens of value-based programming, these values are systematically positioned within a matrix that structures their relationship to future indicators. This methodological intertwining establishes an interdisciplinary bridge between architectural programming and morphological-landscape analysis of spa settlements. The integration works in two directions: (1) on the one hand, values are grounded in specific landscape dimensions, while on the other, (2) the spascapes dimensions acquire an enhanced analytical capacity by being translatable into operational design parameters. Ultimately, this methodological integration generates a platform for developing value–indicator matrices as tools for design and planning, enabling the translation of complex spatial and ecological layers into actionable frameworks for sustainable and user-oriented elderly housing.

3.4. Research Protocol

As a research protocol, the methodological integration was carried out in several steps. In the first step, a clear correspondence was established between the values to be embedded within the programming matrix and the six landscape dimensions of the *spascapes* construct, which serve as the foundational categories. In the second step, the Compendium of Spa

Settlements was systematically examined, focusing on twelve identified role models of *spascapes* in Serbia. Through this analytical reading, two key outputs were generated: (1) design implications for elderly housing were derived, highlighting spatial qualities, organizational patterns, and environmental conditions relevant to sustainable and user-oriented living for aging populations, and (2) a set of possible indicators was identified, capturing measurable or observable aspects that could operationalize these design implications. At the intersection of design implications and possible indicators, a core value was defined for each *spascapes* dimension. These core values provide the conceptual focus that allows for the formulation of design principles, effectively bridging the descriptive analysis of spa settlements with the prescriptive logic of architectural programming.

4. RESULTS AND DISCUSSION

4.1. Matrix Constitution

The construction of the matrix is not a technical exercise of aligning dimensions with values, but rather a methodological act of translating spatial insights into design-oriented knowledge. It emerges from the Compendium Development of the SPATTERN project, where spa settlements were systematically examined through the lenses of material transformation, territorial regulation, and everyday life. These three interpretative frames provided the analytical depth for identifying how spa environments embody multiple layers of meaning and practice, which could subsequently be consolidated into the six *spascapes* dimensions (Table 1).

Within this framework, each dimension operates as a design lens through which values are revealed and translated into implications for elderly housing. For instance, the hydrothermal dimension - grounded in the material transformation of water infrastructures and climatic modulation - articulates the value of *health and regeneration*. Its design implications extend toward the integration of wellness facilities, therapeutic water, and climatic comfort, emphasizing the entanglement of material systems and human wellbeing. Similarly, the therapeutic dimension reflects everyday practices of care and embodied recovery, producing the value of *wellbeing*. Here, the implications stress multisensory environments, restorative gardens, daylight, and acoustic qualities as architectural mediators of health.

Spascape dimension	Core value	Design implication for elderly housing	Possible indicators
Hydrothermal	Health and Regeneration	Integrating wellness facilities	Number of wellness/therapy units, accessibility of facilities
		Therapeutic water integration	Proximity to springs/baths, water-based therapy availability
		Climate comfort	Indoor temperature/humidity balance, energy use for regulation
Therapeutic	Wellbeing	Multisensory environments	Comfort surveys, noise/light level monitoring
		Gardens and restorative outdoor spaces	Area of therapeutic gardens per resident, frequency of use
		Daylight access	Average daylight factor in dwellings, resident satisfaction
		Acoustic comfort	Acoustic measurements, user feedback on sound levels
Cultural-historical	Identity and Belonging	Adaptive reuse of historic structures	Share of reused heritage buildings, conservation compliance
		Heritage integration in new housing	Presence of heritage motifs/ materials in design
		Storytelling and memory spaces	Number of communal memory rooms/events, resident attachment surveys
Urban	Accessibility and Safety	Walkable access to services	Walkability index, average service distance
		Public transport connectivity	Distance to stops, service frequency
		Integrated services (health, retail, care)	Number of services within 500m, service diversity index
		Safety in public space	Crime statistics, perceived safety surveys
Ecological	Sustainability	Energy efficiency	Building energy performance ratings, renewable energy share
		Green-blue infrastructure integration	Green space per capita, stormwater retention capacity
		Biodiversity-friendly design	Species count, ecological quality indices
Recreational	Social Interaction	Shared communal spaces	Number of shared rooms, occupancy rates
		Intergenerational facilities	Programs/facilities shared across age groups, participation frequency
		Co-housing arrangements	Percentage of units in co-housing clusters, resident satisfaction
		Outdoor leisure infrastructure	Availability of walking loops, benches, usage rates

TABLE 1. Core Values and Design Implications of Spascapes Dimensions in Relation to Elderly Housing

The cultural-historical dimension, informed by territorial regulation and the long durée of heritage continuity, foregrounds the value of *identity and belonging*. Its implications point to adaptive reuse, heritage-sensitive integration, and storytelling spaces that allow design to embed memory and cultural reference. The urban dimension operates at the interface of territorial regulation and everyday urban life, generating the value of *accessibility and safety*. This translates into implications related to walkability, public transport provision, and the integration of essential services within spatial proximity.

The ecological dimension draws on material transformation and environmental regulation, articulating *sustainability* as its core value. Its design implications stress energy efficiency, green-blue infrastructure, and biodiversity-sensitive solutions that align housing for the elderly with broader ecological commitments. Finally, the recreational dimension, grounded in everyday life, emphasizes *social interaction* as a key value. Its implications include shared and intergenerational spaces, co-housing arrangements, and outdoor leisure infrastructures that support participation and active living.

By aligning the *spascapes* dimensions with the triadic framework of material transformation, territorial regulation, and everyday life, the matrix establishes a relational structure that bridges analytical categories with design perspectives. It demonstrates how the morphological and ecological realities of spa settlements can be reframed into programmatic logics that guide architectural decision-making. In this sense, the matrix is not only a representational tool, but also a heuristic device: it frames design as a process of value translation, in which spatial observations are systematically re-articulated into principles for sustainable and user-oriented housing for aging populations.

4.2. Matrix Elaboration

The following discussion provides an elaboration of the six identified *core values* that structure the programming matrix. The elaboration is intentionally two-fold. First, each subsection rearticulates the value as derived from the *spascapes* framework, connecting it to the design implications and possible indicators generated through the analysis of spa settlements as spatial laboratories. Second, each subsection extends beyond the spa framework, considering how the same values and indicators may be applied to elderly housing more generally. This two-tiered approach ensures that the matrix is not confined to the specificity of spa settlements but also demonstrates its relevance and transferability across broader architectural and urban design practices for elderly housing.

4.2.1. Natural Therapeutic Resource and Environmental Atmosphere

The hydrothermal dimension, rearticulated as the value of *health and regeneration*, emphasizes the role of natural therapeutic resources and climatic atmospheres as design drivers. In the context of elderly housing, this translates into design implications that prioritize the integration of wellness facilities, the accessibility of therapeutic water, and the modulation of climatic comfort. Possible indicators include the distance of dwellings to hydrothermal nodes, the

presence of water-related features in communal areas, and the quality of indoor thermal regulation. For architectural programming, this means embedding health-supportive infrastructures within everyday living environments, ensuring that the therapeutic logics of spa settlements are transposed into housing schemes.

More broadly, the value of *health and regeneration* can inform elderly housing design irrespective of proximity to hydrothermal resources. Here, indicators can extend toward the integration of indoor wellness technologies (Koch, 2001), natural ventilation systems (Liu et al, 2024; Serrano-Jiménez et al, 2020), or biophilic elements (Lee & Park, 2025; Elsafty, 2024) that simulate regenerative atmospheres. Such an approach allows architects to embed health-oriented design principles in diverse urban or rural contexts, where water-based therapies are not available but the ambition for climate-sensitive, restorative environments remains equally relevant.

4.2.2. Care, Recovery, and Embodied Healing Practices

The therapeutic dimension, articulated as *wellbeing*, derives from the everyday practices of care and embodied recovery that define spa settlements. For elderly housing, design implications focus on multisensory environments, therapeutic gardens, daylight provision, and acoustic comfort. Indicators include comfort surveys, daylight factors, and noise-level assessments. Through these, housing projects can operationalize wellbeing by creating restorative ambiences that extend care practices beyond healthcare facilities and into the daily lives of residents.

Beyond spa settlements, the value of *wellbeing* can guide elderly housing design through universal strategies such as age-sensitive ergonomics (Paiva, Ferrer & Villarouco, 2015; Villarouco et al, 2016), adaptable interior layouts (Pelsmakers & Warwick, 2022; Zhang et al, 2019), or neighborhood-level amenities supporting physical and mental health (Rosso et al, 2013). Indicators can include flexibility of room configurations (Magdziak, 2019), access to green micro-spaces (Ali, Rahaman & Hossain, 2022; Artmann et al, 2017), and promotion of a psychological sense of community (Zaff & Devlin, 1998). This widens the applicability of therapeutic design logics, positioning elderly housing as an everyday infrastructure of care rather than a specialized typology.

4.2.3. Identity, Memory, and Heritage Continuity

The cultural-historical dimension underpins the value of *identity and belonging*. Elderly housing, when informed by this value, must engage with memory, heritage continuity, and cultural storytelling. Design implications include adaptive reuse of heritage structures, integration of cultural motifs into new housing, and the provision of storytelling or memory spaces. Indicators include the share of heritage-sensitive interventions, presence of cultural programs, and resident surveys on place attachment.

Applied more generally, the value of *identity and belonging* may extend beyond historic environments to include design strategies that foster community identity (Zaff & Devlin, 1998) in contemporary contexts. Indicators can range from the integration of public art and community spaces to the co-creation of housing layouts with residents (Terkelsen et al, 2022). These strategies ensure that elderly housing fosters a sense of rootedness and belonging, even in newly built environments without direct heritage references.

4.2.4. Functional Integration and Accessibility

The urban dimension translates into the value of *accessibility and safety*, recognizing the importance of functional integration within broader urban systems. For elderly housing, implications include walkable access to everyday services, connectivity to public transport, and the integration of health, retail, and care facilities within proximate reach. Indicators range from walkability scores to service radius measures and perceived safety surveys.

More broadly, *accessibility and safety* become fundamental criteria for any elderly housing project, regardless of location. Indicators may extend to digital accessibility (Ellison-Barnes et al, 2021), integration of smart mobility services (Jachan et al, 2021), or new neighborhood planning strategies that promote mixed-use accessibility (Park, Lee & Kim, 2013). The emphasis shifts from embedding housing into existing spa-centered urban cores to creating universally accessible environments that empower elderly populations to remain active and independent.

4.2.5. Environmental Resilience and Sustainability

The ecological dimension is articulated as the value of *sustainability*, where environmental resilience becomes a central criterion for housing design. Elderly housing informed by this dimension must address energy efficiency, green-blue infrastructures, and biodiversity-sensitive strategies.

Indicators include energy performance ratings, proportion of renewable energy integration, and biodiversity indexes. Outside spa settlements, sustainability-oriented elderly housing can operationalize resilience by incorporating passive design strategies, circular material use, and localized food or energy production. Indicators may include lifecycle carbon assessments, material reuse ratios, and energy self-sufficiency levels. In this way, the ecological dimension reframes elderly housing not only as environmentally adaptive but also as an active contributor to sustainable urban and regional systems.

4.2.6. Everyday Leisure and Active Wellbeing

The recreational dimension produces the value of *social interaction*, focusing on everyday leisure and active wellbeing as indispensable to elderly life. Design implications highlight shared communal spaces, intergenerational facilities, co-housing arrangements, and outdoor leisure infrastructures. Indicators include participation rates, community activity frequency, and occupancy rates of shared amenities.

Applied more generally, the value of *social interaction* can inspire diverse housing models that embed everyday leisure in contexts ranging from dense cities to rural peripheries. Indicators might extend to digital participation platforms, neighborhood-level cultural programming, or flexible interior spaces adaptable to both solitary and collective activities. In this way, elderly housing can transcend its basic residential function to become a socially performative infrastructure fostering interaction, exchange, and active living.

4.3. Dual Layered Application of Core Values

The discussion developed in Section 4.2 has demonstrated that the six identified *core values* can be read and operationalized in two distinct yet complementary ways. On the one hand, they are grounded in the analytical framework of spa settlements and the *spascapes* construct, where values emerge from the interplay of material transformation, territorial regulation, and everyday life. On the other hand, their design implications extend beyond this framework, offering generalizable insights for elderly housing typologies in diverse urban and territorial contexts.

To capture this duality, the following table presents a two-layered synthesis: for each core value, design implications and indicators are shown first in relation to *spascapes*, and then reinterpreted for broader application across elderly housing practices.

This comparative structure highlights both the situated specificity of spa settlements as spatial laboratories and the transferable potential of values and indicators across different design settings (Table 2).

Core Value	Within the Spascapes framework	Beyond the Spascapes framework
Natural Therapeutic Resource and Environmental Atmosphere	Hydrothermal dimension linked to *health & regeneration*; design implications: integration of wellness facilities, accessibility to therapeutic water, climate comfort; indicators: distance to hydrothermal nodes, indoor thermal regulation, water-based communal features	Health-oriented design even without hydrothermal resources; integration of indoor wellness technologies, biophilic elements, natural ventilation; indicators: air quality, presence of restorative spaces, resident health satisfaction
Care, Recovery, and Embodied Healing Practices	Therapeutic dimension rearticulated as *wellbeing*; design implications: multisensory environments, gardens, daylight, acoustic quality; indicators: comfort surveys, daylight factor, noise assessment	Wellbeing operationalized through adaptable layouts, age-sensitive ergonomics, neighborhood-level care hubs; indicators: flexibility of rooms, access to micro-green spaces, availability of community health services
Identity, Memory, and Heritage Continuity	Cultural-historical dimension reframed as *identity & belonging*; design implications: adaptive reuse, heritage-sensitive integration, storytelling and memory spaces; indicators: share of heritage-sensitive interventions, cultural programs, place-attachment surveys	Applied to new environments through co-created housing designs, public art, cultural programming; indicators: community participation rates, perceived cultural recognition, social cohesion indices
Functional Integration and Accessibility	Urban dimension articulated as *accessibility & safety*; design implications: walkability, public transport, integrated services; indicators: walkability scores, service radius, safety surveys	Universal application in all housing contexts; design implications: digital accessibility, smart mobility, mixed-use neighborhood planning; indicators: accessibility audits, ICT integration, multimodal service availability
Environmental Resilience and Sustainability	Ecological dimension reframed as *sustainability*; design implications: energy efficiency, green-blue infrastructures, biodiversity-sensitive design; indicators: energy performance ratings, share of renewables, biodiversity indexes	Extended to broader ecological strategies: passive design, circular material use, localized energy/food systems; indicators: lifecycle carbon assessment, material reuse ratios, self-sufficiency levels
Everyday Leisure and Active Wellbeing	Recreational dimension reframed as *social interaction*; design implications: shared communal spaces, intergenerational facilities, co-housing, outdoor leisure infrastructures; indicators: participation rates, community activity frequency, shared space occupancy	Broadened to diverse contexts: digital participation, flexible interiors, neighborhood-level leisure/cultural programs; indicators: digital engagement rates, adaptability of spaces, frequency of cultural events

TABLE 2. Dual-Layered Matrix of Core Values: Spascapes Framework vs. Broader Elderly Housing Applications

5. CONCLUDING REMARKS

This study has shown that spa settlements, when reframed through the spascapes framework, provide a powerful reference for designing sustainable and user-oriented elderly housing. By translating six interrelated landscape dimensions into a value-based programming matrix, the research demonstrates how abstract notions such as health, wellbeing, belonging, accessibility, sustainability, and social interaction can be systematically connected to design implications and measurable indicators. The essential interpretation is that elderly housing cannot be approached solely through technical or demographic adjustments, but requires a methodological reorientation where values explicitly guide architectural programming and spatial decisions. Placed within the broader landscape of European policy frameworks and scholarly debates, this study both confirms and extends existing knowledge. It aligns with EU and WHO calls for age-friendly, inclusive, and adaptable environments, yet it goes further by operationalizing these aspirations into a systematic design tool. The strength of this approach lies in its twofold articulation: (1) first, through the situated lens of spa settlements as spatial laboratories, and (2) second, through its broader applicability to diverse elderly housing contexts. While the framework's reliance on case-specific knowledge from spa environments may be seen as a limitation, it also acts as a testing ground that exposes values otherwise overlooked in conventional housing research. Unexpectedly, this dual reading of spa settlements not only reveals design strategies for elderly housing but also reshapes how heritage, ecology, and community can be integrated into architectural programming. In summary, this article advances a value-based programming methodology that positions spascapes as a conceptual and practical bridge between heritage-informed environments and future-oriented housing models. Its significance lies in demonstrating how architectural programming can become a dynamic process of value translation, enabling sustainable, adaptable, and dignified housing for aging populations. Moving forward, further research should test and refine the proposed matrix across different urban and rural contexts, exploring how indicators perform under varying cultural, economic, and ecological conditions.

Funding

This research was supported by the Science Fund of the Republic of Serbia, Grant No. 7408, Future Heritage of Spa Settlements: Digital Platform for Advancing Knowledge and Innovation in Urban Morphology Approach for Environmentally-Sensitive Development in Serbia—SPATTERN (https://spattern.org/).

Conflicts of Interest

The Science Fund of the Republic of Serbia had no role in the design of the study, in the collection, analyses, or interpretation of data, in the writing of the manuscript, as well as in the decision to publish the results.

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