

INTEGRATED PROJECT FORMULATION, APPRAISAL, AND CONTRACT FRAMEWORK FOR A SUSTAINABLE WELLNESS CENTRE IN KOZHIKODE: EMPHASIZING AESTHETICS, ENVIRONMENTAL QUALITY, AND USER SAFETY

MANJUSHA K M¹, Dr. P. A PRABAKARAN², Dr. U. SINDHU VAARDHINI³, Mr. A. ASWIN BHARATH⁴

¹ PG STUDENT, DEPARTMENT OF CIVIL ENGINEERING, KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE, INDIA

^{2,3,4} ASSISTANT PROFESSOR, DEPARTMENT OF CIVIL ENGINEERING, KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE, INDIA.

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Corresponding Author:

MANJUSHA K M

Abstract:

Rapid urbanization, demographic shifts, weakening joint-family systems, and increasing mental health concerns have created an urgent need for organized and inclusive care infrastructure in Indian cities. This study presents the integrated project formulation, appraisal, and contract framework for a proposed Sustainable Wellness Centre in Kozhikode, Kerala, combining daycare, elderly care, and mental wellness services within a single facility. The project is planned as a G+2 structure with a built-up area of 33,390 sq. ft on a 2-acre site located adjacent to the Government General Hospital and the National Urban Health Mission District Office. A structured methodology comprising literature review, questionnaire-based community survey (141 respondents), site analysis, project formulation, and technical, financial, economic, and market feasibility assessment was adopted. Planning decisions were guided by principles of functional zoning, accessibility, aesthetics, environmental quality, and user safety. The findings indicate strong community demand, preference for government or public-private partnership (PPP) funding, and high acceptance of sustainable strategies such as solar energy systems and rainwater harvesting. The estimated project cost of ₹6.55 crores and a benefit-cost ratio above 1.0 confirm financial viability and positive social impact. The study proposes a replicable framework for integrated urban social infrastructure development.

Keywords: Project formulation, Feasibility appraisal, Contract framework, Sustainable infrastructure, Environmental quality, User safety, Wellness centre

1. INTRODUCTION

Urban development in the contemporary era extends beyond physical infrastructure provision to include social equity, public health, and community well-being as essential objectives. Indian cities are currently experiencing complex socio-demographic transformations, including population ageing, migration, increased female workforce participation, declining joint family systems, and heightened psychological stress. These transformations have weakened traditional informal caregiving structures and highlighted the inadequacy of existing institutional facilities for childcare, elderly care, and mental health services.

Childcare facilities are often fragmented and limited to private commercial centers; elderly care facilities are frequently perceived as institutionalized and socially detached; and mental healthcare remains stigmatized and inadequately integrated within everyday community environments. Fragmentation of these services leads to inefficiencies, accessibility barriers, and underutilization of resources.

An integrated infrastructure model that combines daycare, elderly care, and mental health wellness services within a single facility offers a holistic solution to these challenges. Such a model supports intergenerational interaction, optimizes spatial and operational efficiency, improves accessibility, and strengthens community cohesion. The proposed project at Kozhikode responds directly to these emerging urban realities by offering a context-sensitive, sustainable, and community-oriented infrastructure solution.

2. LITERATURE REVIEW

The concept of integrated social infrastructure has gained increasing attention in urban planning, public health, and construction management research, particularly in response to demographic transition, changing family structures, and rising care needs. Scholars increasingly recognize that fragmented facilities for childcare, elderly care, and mental healthcare fail to address the complex, overlapping needs of contemporary urban populations.

COMMUNITY-BASED DAYCARE AND ELDERLY WELL-BEING IN INDIA

Author(s): Jacob, M. E., Abraham, V. J., Abraham, S., & Jacob, K. S. (2007)

This study examines the impact of community-based daycare services on the mental health and quality of life of elderly populations in rural South India. The authors found that elderly individuals who regularly participated in daycare activities showed significant improvement in emotional well-being, reduced loneliness, and improved social engagement. The research highlights the importance of structured community environments in promoting healthy ageing. This supports the inclusion of elderly care spaces in the proposed integrated wellness centre and strengthens the argument for socially supportive infrastructure.

EFFECTIVENESS OF INTEGRATED CARE MODELS AMONG ELDERLY POPULATIONS

Author(s): Liao, S. J., et al. (2022)

This paper evaluates the effectiveness of integrated care models that combine healthcare, social services, and community support for elderly populations. The findings indicate that integrated systems improve continuity of care, increase user satisfaction, and lead to better health outcomes when compared to fragmented service delivery. The study emphasizes that coordination between services is essential for sustainable care models, which directly supports the concept of integrating daycare, elderly care, and mental health services in a single facility.

OLDER ADULTS' DEMAND FOR INTEGRATED CARE AND INFLUENCING FACTORS

Author(s): Wang, Z., et al. (2021)

This research explores the factors influencing older adults' demand for integrated care services. The authors identify accessibility, proximity, affordability, and trust in service providers as key determinants of service utilization. The study highlights that well-located and user-friendly infrastructure significantly increases acceptance of care facilities. These findings justify the importance of site selection and user-oriented planning adopted in the present study.

ORGANIZING INTEGRATED HEALTHCARE SERVICES FOR AGING POPULATIONS **Author(s): de Carvalho, I. A., et al. (2017)**

This paper discusses how healthcare systems should be organized to respond effectively to the complex needs of ageing populations. The authors argue that fragmented services lead to inefficiencies and reduced accessibility, whereas integrated service models improve overall system performance and equity. The study

supports the idea that infrastructure planning should encourage coordination and integration at both organizational and spatial levels.

MENTAL HEALTH INTEGRATED CARE MODELS IN PRIMARY CARE SETTINGS Author(s): Isaacs, A. N., et al. (2024)

This study analyses integrated mental health care models within primary healthcare systems and evaluates their outcomes. The authors found that integrating mental health services into mainstream environments reduces stigma, improves early intervention, and increases service utilization. The findings strongly support the inclusion of mental wellness services within the proposed wellness centre, rather than treating them as isolated facilities.

BARRIERS TO INTEGRATED PHYSICAL AND MENTAL HEALTH CARE

Author(s): Rodgers, M., et al. (2018)

This mapping review identifies major barriers to effective integration between physical and mental health services. The authors highlight organizational fragmentation, poor coordination, inadequate infrastructure planning, and lack of governance as key obstacles. The study suggests that integration must be addressed during the planning and project formulation stages, which reinforces the methodological approach adopted in this research.

COMMUNITY-BASED ELDERLY CARE AND SOCIAL PARTICIPATION

Author(s): Jiang, H. (2023)

This paper explores how community-based elderly care services influence social participation among older adults. The findings indicate that accessible and locally embedded care facilities significantly enhance social engagement, reduce isolation, and improve overall life satisfaction. This supports the design philosophy of developing the wellness centre as a community-integrated facility rather than an isolated institution.

INTEGRATED CARE FOR OLDER PEOPLE: A SYSTEMATIC LITERATURE REVIEW Author(s): Reed, J., Cook, G., & Childs, S. (2005)

This literature review examines existing models of integrated care for older people and concludes that coordinated, multidisciplinary approaches result in better outcomes for both service users and providers. The authors emphasize that integration should occur across planning, service delivery, and organizational levels. This supports the holistic approach adopted in the current study, which integrates planning, feasibility, and contract frameworks.

BUILT ENVIRONMENT QUALITY AND PSYCHOLOGICAL WELL-BEING

Author(s): Kaplan, R., & Kaplan, S. (1989)

This foundational work explains how environmental qualities such as natural light, views, greenery, and spatial clarity contribute to psychological comfort and stress reduction. The theory of restorative environments presented in this study supports the importance of aesthetics and environmental quality in wellness-related infrastructure, reinforcing the planning principles used in the proposed project.

PROJECT FORMULATION AND MANAGEMENT FOR SUCCESSFUL INFRASTRUCTURE DELIVERY Author(s): Kerzner, H. (2017)

This study emphasizes that successful projects depend heavily on early-stage project formulation, clear scope definition, feasibility analysis, and effective control mechanisms. The author argues that many projects fail due to weak planning rather than technical limitations. This supports the inclusion of structured feasibility appraisal and contract framework development in the present research.

3. METHODOLOGY

This study adopts a structured and systematic research methodology to ensure that the proposed Sustainable Wellness Centre is not only conceptually sound but also technically feasible, financially viable, and practically implementable. The methodology integrates both qualitative and quantitative approaches and is organized into sequential stages: literature review, site analysis, project formulation, feasibility assessments, sustainability and environmental quality evaluation, implementation and monitoring framework, and contract framework development.

3.1 LITERATURE REVIEW

The study began with an extensive review of scholarly journal articles, books, policy documents, and international guidelines related to integrated care models, social infrastructure planning, sustainability, environmental quality, user safety, and project management. Literature from domains such as gerontology, mental health systems, urban planning, environmental psychology, and construction management was analyzed. This review helped in identifying theoretical foundations, global best practices, and existing research gaps. The insights derived from the literature informed the framing of research objectives, selection of planning principles, and development of the overall conceptual framework.

3.2 SITE ANALYSIS

Site analysis was carried out to evaluate the suitability of the selected location near Kozhikode Main Beach. The analysis considered physical, contextual, and functional parameters such as accessibility, connectivity, surrounding land use, proximity to healthcare facilities, environmental conditions, and development potential. Observational studies and secondary data from maps and planning documents were used to understand opportunities and constraints. This stage ensured that the project proposal was grounded in real spatial conditions rather than being a purely theoretical exercise.

3.3 PROJECT FORMULATION

Based on findings from the literature review and site analysis, the project was formulated as an integrated wellness facility combining daycare, elderly care, and mental wellness services. User needs, inclusivity, and functional efficiency were treated as primary drivers of planning. Conceptual zoning, spatial relationships, circulation logic, and overall building typology were developed to ensure accessibility, privacy, and ease of use for diverse user groups. This stage translated abstract research insights into a tangible project concept.

3.4 TECHNICAL FEASIBILITY ASSESSMENT

Technical feasibility focused on evaluating whether the proposed project could be realistically implemented within the physical and functional constraints of the site. Factors such as building height (G+2), circulation systems, accessibility for elderly and children, compliance with safety considerations, and compatibility of functions were assessed. The feasibility of providing essential infrastructure such as access roads, services

integration, and emergency movement was also considered. This ensured that the proposal was technically practical and constructible.

3.5 FINANCIAL FEASIBILITY ASSESSMENT

Financial feasibility was assessed using BOQ-based cost estimation derived from project documentation. The total project cost was estimated at approximately ₹6.55 crores. In addition, a questionnaire-based community survey involving 141 respondents was conducted to understand affordability levels, user expectations, and preferred funding mechanisms. Responses indicated strong preference for government or PPP models and affordable user charges. A benefit–cost perspective was applied to confirm that the project offers both economic viability and social value.

3.6 SUSTAINABILITY AND ENVIRONMENTAL QUALITY ASSESSMENT

Environmental performance was evaluated by examining how the project responds to natural light, ventilation, thermal comfort, and ecological considerations. Passive design strategies such as verandahs, appropriate orientation, and window placement were analyzed for their contribution to indoor comfort. Sustainability measures including rainwater harvesting, solar energy utilization, and reduced dependency on mechanical systems were incorporated into the assessment. This stage ensured that the project aligns with principles of long-term environmental responsibility and operational efficiency.

3.7 IMPLEMENTATION AND MONITORING FRAMEWORK

To ensure real-world applicability, the study also considered implementation logic. Construction management principles such as coordination between stakeholders, supervision mechanisms, quality control procedures, and phased execution were examined. A monitoring framework was conceptually developed to track progress during execution and to ensure that project objectives related to quality, safety, time, and cost are achieved. This strengthens the practical credibility of the proposal.

3.8 CONTRACT FRAMEWORK DEVELOPMENT

The final methodological stage involved developing a contract and project management framework to validate executability. This included defining the project scope, identifying key work components through a Work Breakdown Structure (WBS), selecting an appropriate contract type, and proposing a procurement strategy. Provisions related to time management, scheduling, cost control, and accountability were also outlined. Incorporating this framework ensures that the project is not only academically structured but also aligned with professional construction industry practices.

4. SITE ANALYSIS

Site analysis is a critical stage in project formulation, as the success of social infrastructure depends strongly on its physical context, accessibility, surrounding land use, and environmental characteristics. For the proposed Sustainable Wellness Centre, the selected site is located near Kozhikode Main Beach, Kerala, adjacent to the Government General Hospital and the National Urban Health Mission (NUHM) District Office. This location provides both functional relevance and strategic advantage for a healthcare-oriented public facility.

4.1 LOCATION AND CONTEXT

The site lies within an urban institutional zone of Kozhikode city, surrounded by public service buildings and active community areas. Its proximity to the Government General Hospital is particularly significant, as it creates a natural synergy between medical services and wellness-oriented functions such as elderly care and mental health support. The surrounding context enhances the credibility of the project and strengthens its role as an extension of the city's public health infrastructure rather than an isolated facility.

The presence of public offices, healthcare institutions, and residential neighbourhoods in the vicinity also indicates a strong potential user base. This context supports the idea of developing the wellness centre as a community-integrated facility, accessible to diverse user groups including families, senior citizens, caregivers, and individuals seeking mental wellness support.

Figure 1. Site Location Map



4.2 ACCESSIBILITY AND CONNECTIVITY

Accessibility is one of the most important criteria for public social infrastructure. The selected site benefits from good road connectivity and is easily reachable from major parts of the city. The presence of nearby arterial roads ensures smooth vehicular access for staff, visitors, emergency vehicles, and service providers. At the same time, the area is also well connected by public transportation, making it convenient for users who may not have access to private vehicles.

Pedestrian accessibility is equally important for a facility serving elderly people and children. The surrounding urban fabric includes footpaths, active streets, and walkable connections, which improve ease of movement for users. This level of accessibility strengthens the project's inclusivity and ensures that the facility can genuinely function as a public wellness space rather than a restricted institution.

4.3 SITE AREA AND PHYSICAL CHARACTERISTICS

The total site area is approximately 2 acres, which provides sufficient space for accommodating the proposed G+2 building, internal circulation, landscape areas, and service zones. The size of the plot allows for balanced development without over-congestion, ensuring that built-up spaces are supported by adequate open areas for light, ventilation, movement, and outdoor activities.

The relatively regular plot shape supports efficient planning and flexibility in zoning. Adequate setbacks can be maintained for safety, privacy, and environmental comfort. The site does not present major topographical constraints, making it suitable for construction without extensive earthwork or complex engineering interventions. This enhances the technical feasibility of the project.

4.4 SURROUNDING LAND USE AND FUNCTIONAL COMPATIBILITY

The surrounding land use pattern is predominantly institutional and mixed urban, which makes the site highly compatible with the proposed function. The presence of hospitals, public offices, and residential areas creates an environment where healthcare and wellness-related activities are socially accepted and functionally appropriate.

Unlike purely commercial or industrial zones, this context reduces the risk of land-use conflict and supports long-term sustainability of the project. Users are more likely to feel comfortable accessing a wellness facility in an area already associated with health, care, and public service. This compatibility enhances both user acceptance and operational success

4.5 OPPORTUNITIES OFFERED BY THE SITE

The site presents several positive opportunities for the proposed project:

- Proximity to hospital infrastructure supports emergency access and professional collaboration.
- Central urban location ensures strong visibility and awareness.
- Large site area allows future expansion if service demand increases.
- Surrounding public institutions create trust and legitimacy for the facility.
- Walkable urban context supports elderly-friendly accessibility.

These opportunities make the site particularly suitable for an integrated care facility that aims to serve diverse sections of the community.

4.6 CONSTRAINTS AND PLANNING CONSIDERATIONS

While the site offers strong advantages, certain considerations must be addressed during planning. Being located in an active urban area, issues such as traffic management, noise control, and pedestrian safety require attention. Adequate internal circulation, controlled entry points, and buffer landscaping can help mitigate these concerns.

Additionally, since the project serves vulnerable user groups such as elderly individuals and children, careful planning is necessary to ensure barrier-free access, clear wayfinding, and safe movement within and around the site. These considerations have been incorporated into the project formulation stage.

4.7 RELEVANCE OF SITE TO PROJECT OBJECTIVES

Overall, the selected site strongly supports the objectives of the study. Its strategic location, accessibility, surrounding context, and physical suitability align well with the goals of developing a sustainable, safe, and inclusive wellness centre. The site therefore provides a solid spatial foundation for further project formulation, feasibility analysis, and design development.

5. PROJECT FORMULATION AND FEASIBILITY ANALYSIS

This section translates the findings of the literature review, methodology, and site analysis into a concrete project proposal. It explains how the concept of an integrated wellness centre was developed, how the building was planned, and how its feasibility was evaluated from technical and financial perspectives. The aim is to demonstrate that the proposal is not only socially meaningful but also realistically achievable.

5.1 CONCEPT OF THE PROJECT

The proposed project is conceived as an Integrated Wellness Centre that combines daycare, elderly care, and mental wellness services within a single, cohesive facility. The concept is based on the idea that care services should not function in isolation but should instead be embedded within a shared environment that promotes social interaction, dignity, and accessibility.

The integration of these three functions responds directly to the social challenges identified in the literature review—namely ageing populations, fragmented care systems, and increasing mental health needs. By placing these functions together, the facility aims to encourage intergenerational interaction, reduce stigma associated with mental health services, and improve the efficiency of shared resources such as administration, circulation, and services.

The project therefore moves beyond a traditional building design exercise and positions itself as a social infrastructure model that reflects contemporary urban care needs.

5.2 PLANNING APPROACH AND DESIGN INTENT

The planning approach prioritizes user comfort, inclusivity, clarity of movement, and safety. Since the building caters to vulnerable user groups such as children, elderly individuals, and people seeking mental health support, the spatial organization is designed to be intuitive and non-intimidating.

The architectural intent emphasizes:

- Human-scale spaces rather than institutional character
- Clear visual connections for easy wayfinding
- Logical separation of functions while maintaining overall integration
- Calm, welcoming atmosphere through form, proportion, and openness

The overall built form is designed to be simple and legible, ensuring that users can easily understand how to navigate the facility without confusion.

Figure 3. 3D Front View of the Proposed Facility



Figure 4. 3D Perspective View Showing Building Massing



Figure 5. Aerial 3D View Showing Roof Planning and Overall Form



5.3 FUNCTIONAL ZONING AND SPATIAL ORGANIZATION

Functional zoning is a critical component of project formulation, particularly for multi-user facilities. The building is planned as a G+2 structure, with each level responding to the needs of specific user groups.

- **Ground Floor:** Primarily allocated for elderly care and health-related functions. This reduces the need for vertical movement for older users and improves accessibility. Spaces such as consultation rooms, resting areas, and support functions are located here.

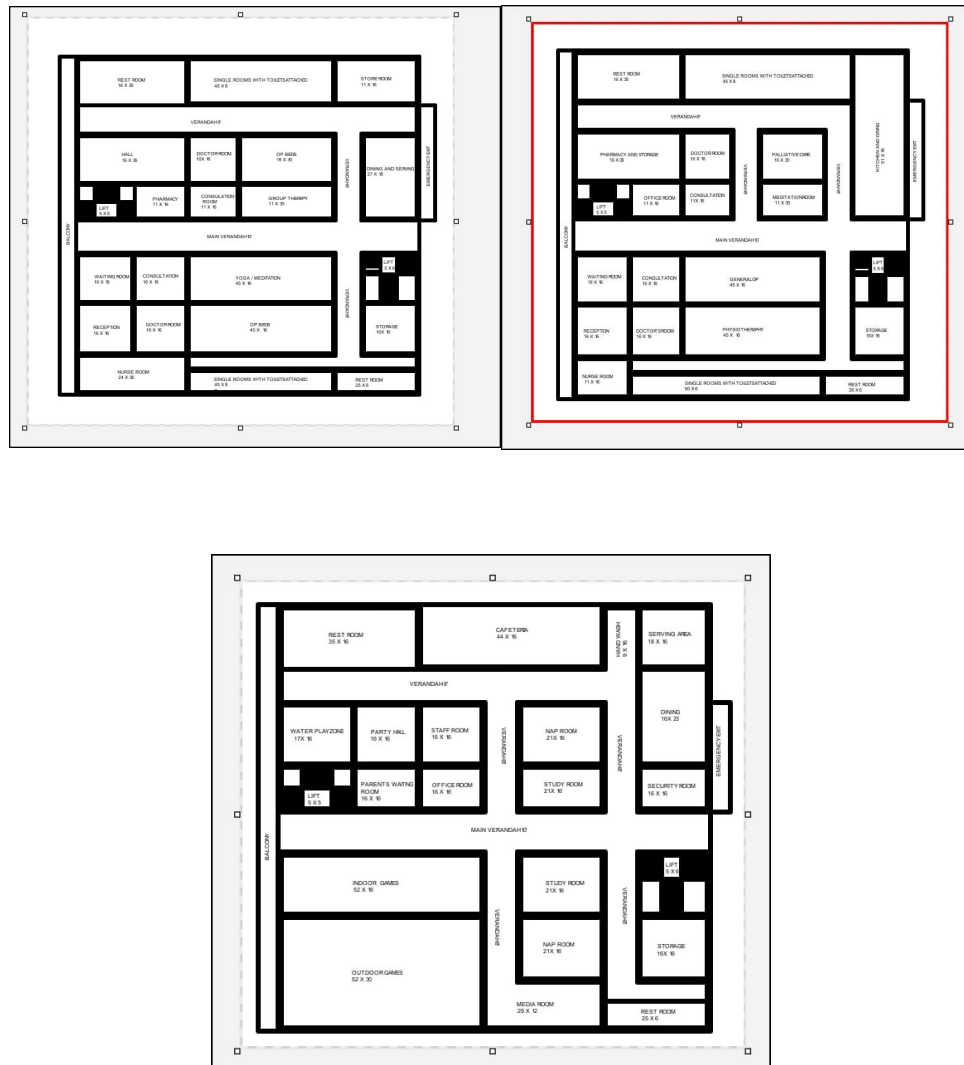
- **First Floor:** Dedicated to daycare and child development functions, including activity areas, learning spaces, and supervised interaction zones.
- **Second Floor:** Reserved for mental wellness functions such as counselling rooms, therapy spaces, and quiet areas, where privacy and calm environments are essential.

This zoning ensures:

- Privacy for sensitive functions
- Logical circulation patterns
- Reduced conflict between different user groups
- Better operational management for staff

The spatial organization also allows for shared support areas such as administration, staff facilities, and services, which improves efficiency.

Figure 4. 2D Drawing



5.4 TECHNICAL FEASIBILITY

Technical feasibility examines whether the project can be realistically implemented based on physical, spatial, and functional conditions.

The G+2 configuration is appropriate for the 2-acre site, as it balances land utilization with accessibility. Building height remains manageable for users such as elderly individuals and children, while still providing sufficient built-up area (approximately 33,390 sq.ft) to accommodate all functions.

Key technical considerations include:

- Adequate site access for emergency vehicles and service circulation
- Logical internal circulation that avoids confusion
- Scope for incorporating essential building services such as water supply, drainage, electrical systems, and fire safety
- Compliance with basic planning principles such as setbacks, open space, and safety

No significant site constraints were identified that would prevent construction. The relatively flat terrain, regular plot shape, and supportive urban context further strengthen the project's technical feasibility

5.5 FINANCIAL FEASIBILITY

Financial feasibility is essential to demonstrate that the proposal is realistic and not merely conceptual. Cost estimation based on the project's BOQ (Bill of Quantities) indicates a total project cost of approximately ₹6.55 crores. This corresponds to an average construction cost that aligns with prevailing market rates for institutional buildings.

In addition to cost estimation, a questionnaire-based community survey (141 respondents) was used to understand affordability levels and user expectations. The survey revealed:

- Strong community demand for such a facility
- Preference for government or PPP-based funding models
- Acceptance of affordable user charges in the range of ₹1000–₹3000 per month
- Positive response toward sustainable features such as solar energy and rainwater harvesting

A benefit–cost ratio (BCR) above 1.0 further supports the argument that the project offers both financial viability and positive social value.

5.6 OVERALL FEASIBILITY ASSESSMENT

When considered together, the findings from technical and financial evaluation suggest that the project is:

- **Socially relevant** (responds to real community needs)
- **Technically achievable** (constructible within site conditions)
- **Financially realistic** (cost aligned with market rates and user expectations)

This integrated feasibility assessment strengthens the credibility of the proposal and demonstrates that it can move beyond academic exploration toward potential real-world implementation.

These views collectively illustrate the building's identity, entrance hierarchy, massing proportions, and overall spatial character.

1. Literature review
2. Site identification and context analysis

6. ENVIRONMENTAL QUALITY FACTORS AND BUILDING SERVICES

The performance of a wellness facility is not determined only by its spatial layout, but also by the quality of the internal environment and the effectiveness of its building services. Since the proposed project caters to sensitive user groups such as children, elderly individuals, and people seeking mental health support, environmental comfort and safety become central design priorities. This section discusses how environmental quality and building services were considered in the planning and evaluation of the project.

6.1 IMPORTANCE OF ENVIRONMENTAL QUALITY IN WELLNESS INFRASTRUCTURE

Environmental quality plays a crucial role in influencing psychological comfort, physical health, and overall user satisfaction. Research in environmental psychology and healthcare design consistently shows that poorly designed environments can increase stress, confusion, and discomfort, while well-designed spaces can support healing, relaxation, and positive social interaction.

In the context of this project, environmental quality is not treated as an additional feature but as a core functional requirement. The facility is intended to feel welcoming, calm, and safe rather than institutional. Therefore, factors such as daylight, ventilation, acoustics, spatial clarity, and thermal comfort were consciously integrated into the planning approach.

6.2 DAYLIGHTING AND VISUAL COMFORT

Natural daylight is one of the most important contributors to psychological well-being. Adequate daylight reduces dependence on artificial lighting, improves mood, and creates a more pleasant indoor environment. In the proposed project, openings are positioned to allow sufficient daylight into activity spaces, consultation rooms, and common areas.

Verandahs and semi-open spaces are used strategically to create a transition between indoor and outdoor environments. These spaces allow light to penetrate deeper into the building while also providing shaded areas that prevent glare and overheating. Such design strategies are particularly beneficial for elderly users, who are sensitive to sudden changes in lighting, and for children, who benefit from visually stimulating yet comfortable environments.

6.3 NATURAL VENTILATION AND INDOOR AIR QUALITY

Good ventilation is essential for comfort, health, and infection control, especially in facilities related to care and wellness. The planning of the building supports cross-ventilation by allowing air movement between openings on opposite sides of occupied spaces. This reduces the dependence on mechanical ventilation systems and improves indoor air quality.

For a facility that includes counselling rooms, elderly care spaces, and daycare areas, fresh air circulation is especially important. Poor ventilation can lead to discomfort, fatigue, and reduced concentration. The use of natural ventilation therefore supports both physical comfort and mental well-being while also contributing to energy efficiency.

6.4 THERMAL COMFORT

Thermal comfort is a key factor affecting the usability of buildings in tropical climates such as Kerala. Excessive heat can cause discomfort, particularly for elderly individuals and young children. The design approach considers shading devices, verandahs, building orientation, and appropriate opening placement to reduce heat gain.

By minimizing direct solar exposure and encouraging airflow, the building can maintain comfortable indoor temperatures for most of the year. This approach supports sustainability by reducing the need for artificial cooling and lowering long-term operational costs.

6.5 ACOUSTIC COMFORT AND NOISE CONTROL

A wellness facility requires a calm and controlled acoustic environment. Noise can negatively affect concentration, privacy, and emotional comfort, especially in counselling rooms and elderly care areas. The planning therefore considers zoning of functions to separate noisy areas (such as daycare activity spaces) from quieter areas (such as therapy rooms and rest areas).

Buffer spaces, corridors, and transitional zones help reduce sound transmission between different functional areas. This improves user experience and ensures that sensitive functions such as counselling can be conducted with dignity and confidentiality.

6.6 SUSTAINABILITY MEASURES

Sustainability is an important component of long-term infrastructure performance. In this project, sustainability is addressed not only as an environmental concern but also as an economic and social consideration.

Proposed sustainability strategies include:

- Installation of solar panels to support renewable energy generation
- Rainwater harvesting systems to improve water efficiency
- Maximizing natural light and ventilation to reduce energy consumption
- Incorporation of landscaped areas to improve microclimate and user well-being

These strategies are also supported by the community survey findings, which indicated strong public acceptance of sustainable features. This suggests that sustainability enhances both environmental performance and user perception of the facility.

6.7 ROLE OF BUILDING SERVICES

Building services are essential to ensure that the facility operates safely, efficiently, and comfortably. The proposed project considers the integration of basic service systems such as:

- **Water supply and plumbing systems** to support hygiene and sanitation
- **Drainage systems** for effective wastewater management
- **Electrical systems** for lighting, equipment, and safety systems
- **Fire safety provisions** including safe exits, alarms, and circulation clarity
- **Vertical circulation systems** (stairs and potential provision for lifts) suitable for elderly and differently abled users

These services are treated as an integral part of the planning process rather than as technical afterthoughts. Their proper integration strengthens both the operational feasibility and safety of the project.

6.8 CONTRIBUTION TO USER SAFETY AND WELL-BEING

Environmental quality and building services together contribute significantly to user safety. Well-lit spaces reduce the risk of accidents, clear ventilation improves health conditions, and organized circulation reduces confusion. For elderly users, barrier-free movement and clear spatial orientation are particularly important. For children, safe materials, visibility, and controlled access are essential. For mental wellness users, calm environments and privacy are critical.

By addressing these aspects holistically, the project reinforces its core objective of creating a facility that is not only functional but genuinely supportive of human well-being.

7. CONTRACT FRAMEWORK AND PROJECT MANAGEMENT

For a project to move beyond a conceptual proposal and become a realistic, implementable infrastructure, it must be supported by a clear contract and project management framework. Many technically sound projects fail due to weak scope definition, poor coordination, lack of cost control, and unclear responsibilities. Therefore, this study incorporates fundamental principles of contract planning and project management to demonstrate that the proposed wellness centre is not only feasible but also professionally structured for execution.

7.1 SCOPE DEFINITION

Clear scope definition is essential for controlling project boundaries and avoiding ambiguity during implementation. For the proposed Sustainable Wellness Centre, the scope includes:

- Site development and external works
- Construction of the G+2 building structure

- Architectural finishes (flooring, wall finishes, doors, windows, etc.)
- Building services including electrical, plumbing, drainage, and fire safety systems
- Landscaping and outdoor spaces
- Provision of circulation areas, access points, and service zones
- Testing, commissioning, and handover of the facility

Defining the scope at this stage ensures clarity regarding what the project includes and prevents unrealistic expectations during execution.

7.2 WORK BREAKDOWN STRUCTURE (WBS)

The project is further structured using a Work Breakdown Structure (WBS), which divides the entire project into manageable components. This improves planning, monitoring, and control.

A simplified WBS for the project includes:

- Pre-construction activities (approvals, drawings, surveys)
- Site preparation and earthwork
- Structural works (foundation, columns, beams, slabs)
- Architectural works (partitioning, plastering, flooring, painting)
- Building services (electrical, water supply, drainage, fire safety)
- External development (roads, pathways, landscaping)
- Finishing, inspection, and handover

Such structuring improves coordination between different teams and helps in tracking progress during implementation.

7.3 CONTRACT TYPE

Considering the nature and scale of the project, a **lump-sum contract** or **EPC (Engineering, Procurement, and Construction) model** is considered suitable. Under these models, the contractor is responsible for delivering the project within the agreed cost and time, based on predefined specifications.

This approach offers advantages such as:

- Better cost certainty
- Clear accountability
- Reduced risk of disputes over variations
- Simplified coordination for the client

For public infrastructure projects, such models are commonly adopted to ensure efficiency and transparency.

7.4 PROCUREMENT STRATEGY

The procurement strategy determines how contractors and consultants are selected. For a public-oriented project such as this, a competitive tendering process with prequalification criteria is recommended.

This ensures:

- Transparency in selection
- Fair competition
- Engagement of technically competent contractors
- Better quality assurance

Prequalification can include criteria such as experience in similar institutional projects, financial capability, and technical expertise. Such a strategy enhances the credibility and reliability of project execution.

7.5 TIME MANAGEMENT AND SCHEDULING

Effective time management is essential to ensure timely completion of the project. A preliminary project schedule can be developed by dividing the work into phases such as design finalization, approvals, construction, services installation, and commissioning.

The benefits of structured scheduling include:

- Clear sequencing of activities
- Better resource planning
- Reduced idle time
- Early identification of delays

Time control mechanisms such as milestone tracking and periodic progress reviews are essential to maintain project momentum.

7.6 COST CONTROL AND FINANCIAL MONITORING

Cost control is critical to ensure that the project remains within the approved budget of approximately ₹6.55 crores. The BOQ-based estimation provides a strong foundation for financial monitoring.

Key cost control strategies include:

- Regular comparison of actual progress with estimated quantities
- Monitoring material usage and procurement costs
- Controlling variations and scope changes
- Ensuring quality compliance to avoid rework

Effective financial monitoring ensures that the project remains economically viable throughout its execution.

7.7 QUALITY CONTROL AND MONITORING

Quality is a key determinant of long-term performance, especially for social infrastructure. A structured monitoring system is therefore essential during execution.

Monitoring measures may include:

- Regular site inspections
- Material testing and quality checks
- Compliance with drawings and specifications
- Documentation of progress and deviations

This ensures that the final built facility reflects the original design intent related to safety, accessibility, environmental quality, and user comfort.

7.8 PRACTICAL RELEVANCE OF CONTRACT FRAMEWORK

By integrating contract planning and project management into the study, the research moves beyond theoretical planning. It demonstrates that the project is aligned with real industry practices and can be realistically implemented through established professional processes

8. RESULTS AND DISCUSSION

This section synthesizes the outcomes of the study and discusses how the findings align with the objectives, methodology, and broader literature on integrated social infrastructure. Rather than presenting numerical experimentation, the results are interpreted through planning outcomes, feasibility findings, survey responses, and project evaluation.

8.1 RESPONSE TO COMMUNITY NEEDS

One of the key outcomes of the study is the clear identification of community demand for an integrated wellness facility. The questionnaire-based survey conducted among 141 respondents indicated strong public support for a facility that combines daycare, elderly care, and mental health services within a single location. Respondents expressed concerns about the lack of affordable and accessible care facilities in urban settings and emphasized the need for government-supported or PPP-based models.

These findings are significant because they demonstrate that the proposed project is not only theoretically justified but also socially grounded. The demand identified through the survey directly supports the relevance of the project within the Kozhikode context.

8.2 VALIDATION OF PLANNING AND PROJECT FORMULATION

The planning framework developed for the project—integrating functional zoning, accessibility, environmental quality, and safety—demonstrates practical viability. The spatial organization into ground floor (elderly care), first floor (daycare), and second floor (mental wellness) effectively addresses the needs of different user groups while maintaining operational clarity.

The placement of functions reflects both user sensitivity and technical practicality. Elderly users benefit from reduced vertical movement, children are accommodated in controlled activity environments, and mental wellness users are provided with privacy and calm spaces. This confirms that the project formulation successfully translates research principles into realistic spatial solutions.

8.3 FEASIBILITY OUTCOMES

The feasibility assessments offer one of the strongest outcomes of the study. Technical feasibility confirms that the project can be accommodated within the 2-acre site without significant physical constraints. The G+2 configuration balances land use efficiency with accessibility and constructability.

Financial feasibility further supports implementation potential. The BOQ-based cost estimate of ₹6.55 crores, along with a benefit–cost ratio above 1.0, demonstrates that the project is economically viable. Additionally, community acceptance of affordable user fees and preference for government or PPP models strengthens the financial realism of the proposal. These findings collectively validate the project as both implementable and sustainable.

8.4 ENVIRONMENTAL QUALITY AND USER EXPERIENCE

The evaluation of environmental quality parameters reveals that the proposed design has strong potential to support user well-being. Design strategies such as natural lighting, cross-ventilation, shading, and functional zoning contribute to a more comfortable and calming environment. This is particularly relevant for vulnerable user groups such as elderly individuals, children, and people seeking mental health support.

The inclusion of sustainability features such as solar energy systems and rainwater harvesting further strengthens the building's long-term performance. Survey responses indicating high acceptance of these features suggest that users increasingly associate sustainability with quality and trust in infrastructure.

8.5 CONTRACT FRAMEWORK AND PRACTICAL IMPLEMENTABILITY

Another significant outcome of this study is the integration of contract and project management principles into an academic project. By defining scope, structuring the work through a WBS, selecting appropriate contract models, and outlining procurement, time, and cost control mechanisms, the study demonstrates that the proposal aligns with real industry practices.

This elevates the research beyond conceptual design and positions it as a realistic infrastructure development model. The integration of professional frameworks enhances the credibility of the project and supports its potential applicability in real-world contexts.

8.6 OVERALL DISCUSSION

When examined holistically, the results suggest that integrated project formulation supported by feasibility analysis, environmental assessment, and contract planning creates stronger, more realistic infrastructure proposals. The project successfully meets its objectives by demonstrating social relevance, technical practicality, financial viability, and professional executability.

The study also highlights that social infrastructure should no longer be viewed only as a design challenge but as a multidisciplinary process involving planning, management, economics, and governance. This integrated approach offers valuable lessons for future urban infrastructure projects.

9. CONCLUSION

This research demonstrates that meaningful infrastructure development must go beyond isolated design solutions and instead adopt a holistic approach that integrates project formulation, feasibility appraisal, environmental performance, and contract planning. Through the case of a proposed Sustainable Wellness Centre in Kozhikode, the study illustrates how social infrastructure can be planned as a realistic, implementable, and socially impactful project.

The proposed facility responds directly to emerging urban challenges such as ageing populations, fragmented care systems, and increasing mental health needs. By integrating daycare, elderly care, and mental wellness services within a single facility, the project promotes accessibility, inclusivity, and social cohesion. The structured methodology—comprising literature review, site analysis, feasibility assessments, and project management frameworks—ensures that the proposal is grounded in both theory and practice.

The findings confirm that the project is technically feasible, financially viable, and strongly supported by community demand. The emphasis on aesthetics, environmental quality, and user safety further strengthens its relevance as a sustainable social infrastructure model. The study therefore offers a replicable framework that can guide future development of integrated wellness facilities in other urban contexts.

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