

Taxonomy of Urban Aesthetics and Sustainability in Two Towns of Odisha

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Abstract

Aesthetically rich environments contribute to the mental well-being and creates an atmosphere for peace, happiness, satisfaction, attraction, and many such positive energies. Such visual aesthetic observed in the small urban space significantly influences mental wellbeing, socio-cultural value and everyday life of human beings. Cities are frequently confronted with a variety of aesthetics and Nilgiri and Remuna NACs are no exception. Therefore, this study focuses on identifying the taxonomies of aesthetics such as natural, socio-cultural, institutional, and livelihood aesthetics. The study has employed ethnography approach, semi-structured interviews, and reflexivity as methods for data and information gathering. SWOT (Strength, Weaknesses, Opportunity, Threat) analysis and Quantitative Strength Planning Matrix (QSPM) technique were performed with Analytic Hierarchy Process (AHP) to identify the most influencing factors shaping urban aesthetics in both Nilgiri and Remuna NACs. Both NACs have their own aesthetical values, and unique aesthetics characteristic across urban environment shaped by local and regional factors. In these urban spaces livelihood aesthetics plays a crucial role in engaging local users and enhancing the overall quality of urban life. Many respondents confirms that the life without aesthetics is not pleasant and lacks happiness and satisfaction. Overall, Nilgiri NAC demonstrates stronger natural aesthetic spaces while Remuna is rich in infrastructural aesthetic. The study also reveals that better urban design, more ordered, structured, aesthetically rich and developed spaces play an important role in the development of small-order urban centres. Integrating aesthetic planning with social protection and environments, small-order urban centers contribute to multiple sustainability development goals at the local level.

1. Introduction

Natural aesthetics are always closer to the human heart [58, 73]. Cities located in hills, riverbanks, beaches, lakes, or forest covers are loved by many [7, 29]. Aesthetic appreciation of the built environment, especially with the natural environment, is multiplied with urban design and planning [12, 36, 45]. Hill stations cities are creating more aesthetics in different levels of appreciation because of the physical environment [56, 73]. Coastal cities are more appreciation for the beautiful beaches, another sort of physical attribute [23, 69]. In the case of river bank cities, they also similar value for the cultural landscape [70, 17]. Unique appreciation goes to Udaipur, Shillong, Nainital, Srinagar, Kodaikanal, and Thane for the rich lake views [29, 8]. Natural aesthetics are always valued in traditional and environmental thoughts as providing more harmony than constructed landscapes [21, 22]. This dichotomy remained powerful for centuries, and even today, when we are all desperate to live city life, we appreciate cities like Munnar, Gangtok, and Kodaikanal for bring aesthetically richness. Bridging the nature and culture of the built environment is not necessarily what we need [73, 79].

We need to appreciate the unique aesthetics of the city space, which again is very much human-centric and inherently ordered. Many, while appreciating planned urban centres like Chandigarh and Gandhinagar, must appreciate the organically grown cities such as Varanasi, Old Delhi, and Kolkata for their culture, traditions and value loaded heritages [25, 62]. Thus, the sublime must think beyond the

confines of the natural aesthetics [33, 83]. Chi Minh city given the cultural spaces within the spaces [38]. The landscape of Slovakia and stresses architectural urban green spaces have the integrated planning to the sustainable urban development [75]. This aesthetics is relational and based on the process between human and environments [83]. More than the state's regime on planning and aesthetics, this research is an attempt to contest the concept of aesthetics by bringing the community's perceptions on physical and social aesthetics in an urban space [33, 61]. "Seeing like a State" by James C. Scott (1998) indicates how the planning process, including schemes and programs of the State failed to address the living conditions in the city spaces by taking examples of Chandigarh and Brasilia [61]. Scott warns that centralized and top-down planning would not help in improving the physical, socio-economic, and living conditions [18, 67]. Jane Jacobs's "Death and Life of Great American Cities" essentially speaks to the volume of street life in urban space and, most importantly, her invention of how cities worked [21]. Whether disordered, chaotic, filthy, or unplanned, Jacob believed that the streets have their own beauty and uniqueness [25, 83]. Wandering in any urban space, one has many things to explore and understand. In urban areas there are multiple functions, such as socio-economic activities, occurring simultaneously [83]. Many spaces look beautiful, ordered, well-spaced, planned, structured, and attractive, while many are chaotic, filthy, dirty, disordered, unstructured, and unplanned. An overall view of the urban space has certain ways of arrangement. Be it the land uses of the master plan or Comprehensive Development Plan (CBD) of a city, or neighbourhood plans, or simply an informal market space. The whole concern is what is that one or two that attracts someone in the urban space [36, 6]. Therefore, aesthetics matter. One would love to visit Ahmedabad, Gandhinagar, Chandigarh, and Salt Lake of Kolkata for the wide roads, better-developed neighbourhoods, and, most importantly, the land use arrangements of the entire city [67, 77]. While many may like Gangtok, Kodaikanal, and urban spaces located as hill stations for a fusion of both nature and culture [36, 69]. How about other Indian urban spaces that are not planned from the beginning or do not have natural beauties to take the attention of others? Are they not aesthetically efficient? Further, aesthetics, which literally means beautification or beauty, are often arranged with the women's body or a synonym with women. Or else, it is nature that is always expressed with the words associated with beauty [46, 36]. But many say "beauty lies in the eyes of the beholder." While a certain space looks chaotic and disordered, still one can sense orderliness within the disorders [36, 58].

Moreover, aesthetics is a product of planning in urban space. Planning allows having high rises, malls, and buildings, often by pushing the poor, marginalized, and displaced many slum dwellers [19]. Planning and politics of the space builds physical aesthetics by emphasizing roads, squares, plantations, pavements, streetlights, wall paintings, parks, recreational spaces, high rises, historical monuments, and formalizing market spaces [44, 83]. Many times, planning displaces people, particularly slum dwellers who are forced to live in disharmony, loss of social relations, loss of livelihoods, and, most importantly, live with uncertainty, even without any temporary ownership over land or assets. Therefore, the structure of aesthetics is based on the structure of another form of aesthetics [33, 61]. The present study intends to assess the urban aesthetics in small urban spaces using both qualitative and quantitative techniques (Fig. 1).

2. Literature review

Urban aesthetics is an interdisciplinary field of study. The term 'aesthetics' holds varying interpretations depending on the philosophical standpoint, and its value is assessed across various conceptual realms, including form, expression, beauty, taste, emotions, symbolism, and imagery [3]. The idea of aesthetics begins to ancient times. In the better understand of important historical figures, religious practices are different time periods [53]. A study focuses to introduce "a model to analyse the relationship between environmental configuration and human perception to identify measurable criteria that indicate the interaction between urban spatial configuration and aesthetic quality. Existing literatures finds different type of aesthetics in their researches. Such as, physical or natural aesthetics [24, 51, 66], in the senses of experience, health, and ecosystem services. The physical dimension is fundamental, as aesthetic responses are first established in the sensory and perceptual relationship with the environment in long-term focus in geography on landscapes [41]. Morphological and visual qualities contain colour, form, vegetation, light and texture directly influence preferences, learning and psychological well-being [66]. These perceptions highlight that aesthetics design that can enhance the mental health and urban liveability. Contribute the SDG3 good health and well-being and SDG 11 sustainable cities and communities promote the health lives and inclusive urban environments.

highlight that the physical aesthetics can and should be integrated with ecological functions, showing how design can address choices between aesthetics and ecosystem service offering. Other things in socio-cultural aesthetics defined the identity, value systems. In the study of local symbolism practices that attracts the peoples forms the symbolism of socio cultural and meaningful value aesthetics appreciation of the value enhancements [4, 23]. Significant of the study was, institutional theory connects aesthetics to power: investors, planners, and elites frequently direct aesthetic agendas [28], and planning procedures that focus on diverse publics in the risk of creating unequal disparities of "aesthetic wellbeing" [40]. According to Koltick, given the human centric assumptions of the aesthetics. Also suggesting the technology can change the aesthetics value and new beauty products can helps you overcome mental barrier [32]. Similarly, the landscape aesthetics of natural and environment perspective are not for the contemporary exclusive but the recent modes of aesthetics experiences [26]. The human perspective supports the integrative theory that defined the high quality human natural and technical interactions of urban aesthetic.

Therefore, the normative theoretical perspective using the institutional perspective to track the productions, and using the natural aesthetics and evaluate the ecological impacts, for the socio-cultural leans of aesthetics. In the basis of empirical study aesthetics experiences is not only in morphological landscape and act forms it is also in the socio-cultural values of peoples [3, 52, 47]. Naturally aesthetic leads to the implementations of aesthetics value and lead to the urban design ensure the ecological resilience's and its mostly related to participatory methods with thinking the design [34, 41]. Thus, the review supports that integrative methodological framework that addresses the issues of aesthetic well-being in the urban setting by connecting the people-centric empirical methods with spatial analysis. In inclusive, resilient, and culturally meaningful urban spaces, that integrative perspective of sustainable

practices. The social value integrated as a vital tool for achieving social sustainability and SDGs [41]. Eco-aesthetics also contribute the creations of liveable cities by integrated the aesthetics values and environments within urban design [24]. sustainable architecture also incorporates the cultural identity of aesthetic values of local communities to ensure the context specific developments [17] enhancing community well-being and maintaining ecological balance within cities [81].

There are relatively few studies that have applied SWOT and AHP analysis [19, 21, 30], while a substantial body of research relies on empirical and ethnographic approaches [9, 59]. In the present study, SWOT, AHP, and QSPM models are employed to analyse large urban spaces; however, in the context of small-order urban centres, the study aims to examine the relevance of these analytical frameworks. Methodologically, the application of a mixed-method approach (combining qualitative and quantitative techniques) remains relatively rare. A major gap in the literature is the neglect of low-order urban spaces, particularly in relation to everyday aesthetics experienced by ordinary people. Much of the existing research focuses on large-scale projects or globally prominent cities, thereby overlooking how residents of smaller or local areas perceive aesthetics and negotiate their everyday challenges [47]. Further research is needed to explore small-order morphological landscapes using empirical methods to capture both socio-cultural and institutional dimensions of urban aesthetics. Accordingly, future studies should emphasize the development of actionable planning strategies that promote well-being and equity.

3. Methodology

3.1. Study Area

The state of Odisha is located in eastern India. It is relatively less urbanized (16.7%, Census of India, 2011), but is rich in socio-cultural heritage and natural resources, and is currently experiencing growth in its economy, infrastructure, and overall development. The region is characterized by a large number of small-order urban centres that have grown rapidly in recent years, reflecting a common pattern observed across Odisha and many other Indian states. The study region, Balasore district is situated in the eastern coastal part of the state and has a low level of urbanization (10.9%, Census of India, 2011). It comprises three municipalities Balasore, Soro, and Jaleswar along with four Notified Area Councils (NACs): Basta, Nilgiri, Remuna, and Simulia. Among these, two NACs were selected for the present study: Nilgiri, an older settlement, and Remuna, a relatively newer one. Nilgiri NAC was established in 1984, whereas Remuna was declared an NAC around 2021. According to the Census of India (2011), the population of Remuna is 33,378, while Nilgiri NAC has a population of 17,264 with growth rates of 14.81% and 16.99%, respectively. Remuna, located close to Balasore city, reflects emerging modern infrastructural developments. In contrast, Nilgiri represents a traditionally developed settlement, characterized by rich natural resources and a strong cultural landscape.

3.2 Study approach and field survey

This research was carried out the urban aesthetic in a small urban space. The taxonomy of urban aesthetics varies on the multiple types of aesthetics. This study selected small-order urban spaces such as Nilgiri and Remuna NACs to identify the most suitable assessment approaches for a specific sort of landscape. This research followed (1) field survey and structural observations (2) mixed analytical approach, and (3) comparative discussion. We are collecting the data on aesthetics through the qualitative method by using ethnography, focus group discussions, semi-structured interviews, and face-to-face interactions. We have prepared the schedule meant for the key information in business communities, such as both formal and informal shopkeepers, vegetable sellers, hospitals, religious trust members, and political representatives such as corporators. We asked many corporations on the role of NACs and corporators, given some planning-oriented work. They also have provided their future agenda on creating and maintaining urban aesthetics. Similarly, using the structured evaluations criteria aesthetic in the essential to progressive the way in order to influence the research result. Also, we are using the Analysis Hierarchy Process (AHP), the SWOT (Strength, Weaknesses, Opportunity, Threat) methods and QSPM (Quantitative Strategic Planning Matrix) matrix analysis for using the weighted data.

3.3 Analysis Hierarchy Process (AHP)

In this study analysis the Analytical Hierarchical Process a powerful decision-making technique to make the decision and the complex qualitative data. It was measuring the AHP Analysis on [57]. This method was use on the pairwise comparison, the analysis of the mixed method on the process is performing the technique of AHP Analysis, QSPM Methods, SWOT methos analysis. First apply AHP method and in this method evaluate the criteria corelations and pair wise compare, which criteria is important or not. The judgement is comparability. The consistency ratio is less than 0.1 in the judgement and the criteria is accessible. First identify the criteria between two NACs, and taken the suitable approaches were considered the criteria and the criteria was putting by the export. This study refers to Nilgiri and Remuna urban planning aesthetics.

3.4 SWOT Analysis

SWOT method is representing the Strength, Weakness, Opportunity and There are evaluate two types of factors, Using the IFE matrix, evaluations of external factor. And another is internal factor in EFE matrix. Both methods are represented the visual factors, the major concentrations were the major visualities of the small order urban space/NAC the strength, weakness, opportunity and risk factors in this technique. SWOT analysis the compare to the internal strength with external opportunity both are created the SO, and also the internal weakness also makes the available of the opportunity to create the ST Strategy. Both are compared the external treat and internal weakness. Also commented to the weakness and threat. both methods SWOT and QSPM matrix are using to the result.

3.5 Determined the IFE matrix external and internal factors

The most important factors are mentions in both the NACs. For the observations through the field study. Here mentation the steps;

1. First, identify the strength and weakness opportunity, Threat are written.
2. Each factors have range as 0 is non-important and to 1 is very important.
3. Each factor has given the number and score was 1 to 4. This score was represented the 1,2,3,4 showing the basic weakness, strength, and very powerful
4. To determine the final score of each of the factors, the coefficient is multiplied by its score.
5. The sum of all factors score of all factors is calculated and the final score is determined.
6. In the matrix of internal factors evaluations, midpoint of the score $(1-4)/2 = 2.5$, the average benchmark value is 2.5, it is the final score. The strength will be increase in 2.5 and the weakness will be decrease than 2.5 score.

3.6 Forming SWOT matrix

3.6.1 Formations of internal and external factors evaluations (IFE) matric

The SWOT matrix has lots of applications for managing the strategies of planners (Abbasi et al., 2013; Abya et al., 2015). Using the urban taxonomical visual, internal and external factors create the dominant factors that need attention. In particular, this matrix links internal and external factors; it was the basic strategy for potential strategies. This analytical strategy develops to be used later in the QSPM matrix. Another application of SWOT is to compare the key external opportunities and threats with internal strengths and weaknesses. Results from the matrix of external and internal factors and these models.

3.6.2 QSPM (Qualitative Strategy Planning Matrix)

This method is an analytical strategy to define the superior strategies [18]. The internal and external weights, which included their matrix of internal and external factors of the city space. In this next column, the 8 columns, such as S01, S02, W01, W02, ST1, ST2, WT1, and WT2, are placed in the table. Each column includes AS (Attractiveness Score) and TAS (Total Attractiveness Score). In the letter multiplying the weight in the attractiveness score, it was taking the value of 1, 2, 3, or 4. The highest value is 4, and the lowest value was 1. Some strategy factors did not have any attractiveness score in that factor. It was emphasized that ASs not be based on guesses; they should be reasonable and relevant to the study. Finally, TASs related to strategy are collected. The highest score has the highest priorities for the aesthetics factors. It is the important strategy selections.

4. Result and analysis

4.1 Taxonomy of urban aesthetics

4.1.1 Natural aesthetic

The visual aesthetic is understood as a physical attribute that is added to the fever of city beautifications. especially facing the hills, water bodies, forests, and artificially created or modified environments that are close to the natural beautifications. It is providing the diversity of landscape experiences. Natural aesthetics are the center of attractions. It is direct connections to the natural landscape of the spaces. Several periods have been focusing on the natural landscape of the city spaces. Table 1 shows the natural aesthetics with different components of aesthetics.

Table 1
Components of natural aesthetic in the two selected ULBs, Balasore District, Odisha.

SL No.	Component	Nilgiri NAC	Remuna NAC
01	Topography	• Recognised for the hills, forest, plantations on road, water bodies	• Not traditionally Planned by considering topographic features • Lack of natural aesthetic
02	Forest Aesthetic	• Greenery around the hill	• Lack of forest aesthetic
03	Water bodies	• Existence of traditional sacred ponds (e.g. Chandan <i>pokhori</i>) • Plantations, sitting chairs, light system, pond cleaning process, Open gym.	• Introduction of project such as “Adarsha pond” Open Gym, chair, (Mukta Scheme.
04	Park aesthetic	• Healthy impactful and graceful aesthetic • Peaceful environment • A space for leisure and entertainment.	• Yet to develop

Source: Field survey by author (2024-25).

Natural aesthetics refers to the integrations of elements such as forests, hill, waterbodies, gardens, in small order city space, to visual quality and urban value. In small towns, these contributions to mental wellbeing, and the peaceful surroundings. Thus, healthy environments there are limited planning priority, in comparisons to Nilgiri hills terrain, waterbodies, forest covers like, Chandan Pokhari, strongly shape its urban aesthetic (Fig. 2). Supporting the environment wellbeing, social cohesion, and cultural identity. The urban planning measurement such as public space, plantations, street lights, open gym, towards planning the promote urban tourism and liveability. In contrast, Remuna NAC lack of natural features and relies mainly on the scheme like, MUKTA Scheme for urban beautifications, that leads to outcomes although comparable planning efforts.

4.1.2 Institutions aesthetic

In terms of urban aesthetics, institutions play a major role in the city space. In the scenes of institutions such as, planning work, road, street light, hospital, school, college, square public architecture monuments are shaping a city spatial and visual character in the scenes of urban aesthetics.

Table 2
Components of institutional aesthetics in the two selected ULBs, Balasore District, Odisha.

Sl. No.	Component	Nilagiri NAC	Remuna NAC
01.	School /collage	• School colleges are designed with plantations and wall painting towards plantations.	• Academic aesthetic is more designed such as plantations/gardening, wall painting for awareness, high rise buildings
02.	Road /sub road	• Traditionally planned • Wide road already planned; Sub roads are connected to sides of the road plantations.	• Narrow road, large area connections to the Balasore main market. • Congested road side around the market place
03.	Street lights	• It is very much designed and organised way by NAC.	• The area is very large, scattered street light are there
04.	Medical aesthetics	• Gardening, wall painting, building aesthetic, infrastructure. well-organised, attracting to human beings.	• Medical aesthetic is often on hygienic, cleanliness and botanical garden.

Source: Field work by author (2023-24).

Table 2 displays the component of aesthetics in Remuna and Nilgiri NACs. Enhancing the planning aesthetics and institutions aesthetics in the ULB in the small order urban spaces. It was essential for the city beautifications. Urban aesthetics play a crucial role was influencing the urban functionality, in local culture and positive in public perceptions. Planned urban growth was Nilgiri NAC, it was reflected that organised road networks, vibrated in market spaces, cultural wall painting near Jagannath temple, it was promoting the aesthetics heritage and community engagement (Fig. 3). Also, in contrasted to Remuna NAC was unorganised aesthetics with towards urban extensions, congested the roads and market complex. It is required the regional planning. Towards improving the MUKTA Scheme for enhancing the planning process, it enhancing the quality of life and socio-cultural wellbeing.

Institutions aesthetics is dynamic role play in the small order city space. There is different planning agencies are their like, NAC (Notified Area Council) doing some infrastructure work wide road, beautifications of hospital with gardening, parks, plantations with street light, school, college, medical and others. These are created the city more beautiful.

4.1.3 Socio-cultural aesthetic

Socio cultural aesthetics play a dynamic role in the urban space. The cultural value is very crucial in the city spaces Table 3. shows the social cultural aesthetics value was very important in the small order city

space. It is also defined the temple aesthetics, in Nilgiri as a tourist spot, peoples are encouraging to gain the knowledge but in Remuna context the architecture was very much attracted to tourism. In some similarity of both places such as, seasonal festival and temple aesthetic.

Table 3
Elements of socio-cultural aesthetics in the two selected ULBs, Balasore District, Odisha.

Sl. No.	Components	Nilagiri NAC	Remuna NAC
1.	Temple Aesthetic	• Most of temples are traditionally rich on the cultural representation. • Peaceful, greenery add value to the temple aesthetic. • Attract to the tourist for historical backgrounds	• Lack of natural aesthetic view • Build up new designed temple aesthetic with some old temples.
2.	Seasonal festival	• Basanti puja, Ram Navami, car festival, Chandan yatra and others.	• Most celebrations festival like Dola Purnima, Holi, 3 places car festival, Basanti puja and lots of Barshika Utshava.
3.	Evening View	• Street lights are more charming • Highrise buildings are decorated light that attracts to peoples. • Evening view is very much peaceful. • Informal vendors (isolated) are facing problem due to forest area.	• Street lights are very much scattered. • High buildings and informal vending zones are creating her own aesthetic.
4.	Wall painting	• Disease related, awareness. • School/college study related awareness • Temple, child marriage. • Sports complex, sports related wall painting • Representations of Nilgiris' Culture	• Medical, sports complex, temple • Cultural representations of Remuna

Sources: Field work by author (2023-24).

Evening view was very dynamics in the city space, such as Nilgiri NAC. It is a contemporary study on creating the vibrant evening in the city space. Different types of festivals, evening lights, and kitchen

gardens. It is creating a dynamic role for the small-order urban spaces.

Source: Field work by author (2023-24).

Figure 4 shows the Nilgiri, there are ample number of temples in that space that places are traditionally rich in by the king's dynasty. Create a spirituality value in the peaceful temple aesthetics. It is also attracted to the tourist for her cultural aesthetics. To enhance the natural aesthetics of the city space. In Remuna NAC, temple aesthetics create the spiritual. Build up a newly designed temple aesthetic with some old temples, such as Khirachora Gopinath Temple, Remuna, and Emami Jagannath Temple. The aesthetic value, different architecture, and the arrangement of plantations, lights, different flowers, and wall paintings are creating a beautiful plan for the stakeholder sand some of the traditional kings. The seasonal festival aesthetics are the Basanti puja, Ram Navami, the car festival, the Chandan yatra, and others. Remuna NAC seasonal festivals such as Dola Purnima, Holi, the three places of the car festival in the Remuna NAC, Basanti Puja, and other festivals are celebrated. Small order urban space arranging the beauty of that space is very beautifully arranged in the place.

4.1.4 Livelihood aesthetics

A comparative study of the urban areas between Nilgiri NAC and Remuna NAC shows unique patterns of spatial organization and aesthetic expression (Table 4). The official marketplace in Nilgiri NAC is well organized and organized along both sides of the road, while the formal market in Remuna NAC looks more random and has a private aesthetic rather than being planned out. Similarly, informal shops in both towns generate their own aesthetic identity; however, Nilgiri exhibits somewhat structured selling arrangements for vegetables, fruits, and other items, while Remuna's informal market is more congested within the market complex. Similarly, informal shops in both towns generate their own aesthetic identity; however, Nilgiri exhibits somewhat structured selling arrangements for vegetables, fruits, and other items, while Remuna NAC informal market is more congested within the market complex. In terms of high-rise buildings, Nilgiri has fewer such structures, and their decorative style remains simple, but Remuna shows a bigger number of high-rise buildings with different signboards, lighting, and decorative materials, adding to a more visually intense urban setting.

Table 4
Component of livelihood aesthetics in the two selected ULBs, Balasore District, Odisha.

Sl. No	Component	Nilagiri NAC	Remuna NAC
01.	Formal Market	• Designed formal market spaces both side of the road. • It is very much designed and the arrangement is effective.	• Haphazard formal market. • Created her own aesthetic.
02.	Informal Market	• Create its own aesthetic. • Arranging for selling product such as vegetables, fruits, and others	• They are created her own aesthetic. • Congested market complex.
03.	High rises buildings	• Less number of high rises, still they are created for own decoration style.	• High rises are more, using different types of sign board, lights, decoration materials.

Source: Field work by author, (2023-24).

In this Fig. 5, the livelihood aesthetics shape the spatial structure of small-order city areas in both formal and informal markets. In Nilgiri NAC, market arrangements are more planned and socially significant, producing an ordered and impactful urban environment. In contrast, Remuna NAC shows crowding, especially in Hatyaganda market complex, where temple aesthetics are mixed with dry fish shops. Livelihood patterns, vegetation, public spaces, and inclusive workplaces reflect dynamic, region-specific aesthetic diversity. Criticality of the study was the dynamics of the livelihood in region to region and the aesthetical value have different for the human perception. Therefore, aesthetics is not static; it is the essence of our daily life.

Source: Field work by author (2023-24).

4.2 Quantitative Assessment

Tables 5–8 analyse the key internal and external aesthetic factors influencing Nilgiri NAC and Remuna NAC. The strength and weakness represent as 1 is weakness, 2 is low weakness, 3 is weak strength, 4 is strength strengths. According to the table, highest strength 0.411 weightage, lowest one is 0.043 score. Asper the weakness, the highest weight is 1.308 score and the lowest one is 0.261 score. After that, by multiplying the weight the degree of weight-based score is taken. Related to the internal factors, it is got the score of average is 2.5 and the maximum amount, is 4. Now, the number is 2.5, from the internal factors it is means that the urban aesthetics in small order urban spaces in the suitable conditions. In the sum of score is 4.967. QSPM uses the weights factors, then using the external factors evaluations in 2 and 4, the important NACs in Nilgiri and Remuna in the urban aesthetic have presented. Opportunity 1 and 2, weak opportunity is 3 weak threat is 4. According to the judgments. In the finding, related to the weight above 2.5 score. The highest opportunity and threat score is 0.442, and lowest score is 0.169.

sum of the amount 5.392. QSPM model given the internal and external factors evaluations. The weight assigned each factor of the small order urban spaces. Also, same process assigned in Remuna NAC.

Table 5
Internal factor of evaluation matrix for Nilgiri NAC.

Strength	Criteria	Weight	Score	Weightage score
S1	Green spaces	0.088	4	0.352
S2	Historic	0.125	3	0.375
S3	temple	0.081	2	0.162
S4	commercial	0.080	2	0.16
S5	Street light	0.199	3	0.597
S6	Livelihood	0.106	3	0.318
S7	city planning	0.092	3	0.276
S8	Wall painting	0.071	4	0.284
S9	Institution	0.058	2	0.116
S10	Festive	0.043	2	0.086
Weakness				
Weakness	Criteria	Weight	Score	Weightage score
W1	Lack of natural aesthetics	0.411	1	0.411
W2	Urban historically significant.	0.261	2	0.522
W3	Market congestion	0.327	4	1.308
Total internal factors				4.967

Table 6
External factor evaluations matrix for Nilgiri NAC.

Opportunity	Criteria	Weight	Score	Weightage score
O1	Cover greenery	0.204	4	0.816
O2	Satellite town to main market	0.181	2	0.362
O3	Culturally rich	0.177	2	0.354
O4	Maximum socio-cultural function	0.112	3	0.336
O5	Historically rich	0.179	3	0.537
O6	Planned city	0.144	3	0.432
Threats	Criteria	Weight	Score	Weightage score
T1	Fear of wild animal	0.246	1	0.246
T2	Not proximity to main market	0.296	2	0.592
T3	Loss the biodiversity	0.246	1	0.246
T4	Risk for natural calamities	0.210	1	0.210
Total external factors				4.131

Table 7
Internal factor of evaluation matrix for Remuna NAC.

Strength	Criteria	Weight	Score	Weightage score
S1	Green spaces	0.116	1	0.116
S2	Historic	0.132	2	0.264
S3	city planning	0.110	2	0.22
S4	institutions	0.131	3	0.393
S5	High rises	0.098	3	0.294
S6	Street light	0.093	3	0.279
S7	Market/commercial	0.087	3	0.261
S8	Livelihood	0.098	2	0.196
S9	Wall painting	0.069	1	0.069
S10	Festivity	0.061	3	0.183
Weakness	Criteria	Weight	Score	Weightage score
W1	Lack of natural aesthetics	0.411	1	0.411
W2	Urban historically Significant	0.261	2	0.522
W3	Market congestion	0.327	2	0.654
Total internal factors				3.862

Table 8
External factors affected by Remuna NAC.

Opportunity	Criteria	Weight	Score	Weightage score
O1	Effective transport and communications	0.411	4	1.644
O2	Proximity to main market	0.261	4	1.044
O3	Commercial strategic locations	0.327	3	0.981
Threat	Criteria	Weight	Score	Weightage score
T1	Urban explanation	0.387	2	0.774
T2	Unplanned growth	0.442	1	0.442
T3	Constant displacement of vendors	0.169	3	0.507
Total external factors				5.392

The SWOT analysis of Nilgiri NAC highlights strong potential in its natural hill environment, cultural heritage, and tourism opportunities, which contribute to aesthetic and economic development (Table 9). Its strengths, such as scenic beauty, historical sites, and satellite town linkages, can be used to promote sustainable tourism and improve human welfare. However, threats like wild animal risks, natural calamities, and biodiversity loss require proper planning and environmental management. Weaknesses, including limited connectivity, market isolation, and rapid urbanization, may hinder balanced growth. Therefore, strategies should focus on conservation, improved accessibility, and planned development to maintain ecological and social stability.

Table 9

SWOT analysis matric for Nilgiri NAC.

Strategies	Opportunity	Threats
Strengths	SO Strategies	TS Strategies
	Hill region is making a better opportunity for natural beauty for human welfare.	Fear of wild animal improved the connectivity and main market to accessibility.
	Historical site has more important to Tourism developments.	Risk for natural calamities to proper management and for human welfare.
	Satellite town also making the small order developments, such as temple, forest covered, tourism developments, commercially rich.	If it is proximity to main market and interlinked to the Satellite town.
	Culturally advantages of visually aesthetic of wall painting.	Loss the biodiversity to create the proper managements of afforestation.
	The city planning give a and another	To improve the quality of life on the hill regions.
Strategies	WO strategies	WT Strategies
Weakness	Preserve the natural aesthetics with planning and develop the tourism developments.	Natural aesthetics is higher the risk factors is increasing of the threat was attack the wild animal.
	Urban historically significant for tourist attraction and improved the traditional and cultural value of that place.	Lack of proximity to main market and the major threat was it is isolated limited expanding surroundings.
	Allotting pleases of new market congestion	Rapidly urbanization increasing, loss of biodiversity, and risk of natural calamities.

In comparison, Remuna NAC shows strengths in transport connectivity, market accessibility, and cultural aesthetics through festivals and wall paintings, supporting urban growth (Table 10). However, the lack of natural aesthetics and increasing urban congestion are key concerns. Weaknesses such as unplanned development, declining historical significance, and limited recreational spaces affect liveability. To address these issues, strategies should emphasize urban planning, preservation of cultural heritage, and the development of green and recreational spaces to ensure sustainable and aesthetically balanced urban growth.

Table 10
SWOT analysis matrix for Remuna NACs.

Strategies	SO Strategies	TS Strategies
Strengths	• Effective transport and communications is the major important of the city growth.	• Urban growth in linear pattern, the road connectivity has affected the transport and communications.
	• Market and commercial place have made the city growth has developed city aesthetics development / proximity to market.	• Vendor displacement and commercial shops growth in the market complex.
	• Through the festival and wall paintings enhancing the cultural aesthetics.	• Proximity to the main market to enhancing the city growth.
Strategies	WO Strategies	WT Strategies
Weakness	• Lack of natural aesthetics create the recreations artificial activities, kitchen garden.	• Lack of natural aesthetics reduce the city beautification for societal wellbeing.
	• Improved the recreations activities of historical aesthetics old temple aesthetics progress.	• The city was unplanned growth for market congestion it is harming the social peace.
	• Decreasing the historically significant and increasing the policy implemented for the urban local body by NAC.	

4.2.1 SWOT analysis diagram for aesthetics

Table 11 illustrated the comparison between the Nilgiri and Remuna NACs' SWOT analyses. In Nilgiri NAC, unique factors and stronger points of the natural aesthetics, planned city, and dynamic aesthetic value of livelihoods. The weakness is the distance to the main cities. Needs the improvements of visual aesthetic. In contrast to Remuna NAC's lack of natural aesthetics, they create the kitchen garden approaches. Also improve the internal and external factors.

Table 11

Nilgiri NAC aesthetics

	SO strategy	TS strategies
Strength	1. Improvement of natural aesthetic makes the urban as visual uniqueness of the city space.	1. Weakness of the place was satellite small town.
	2. Planed city, arranged in a structured way. Dynamic aesthetics of the livelihood aesthetics.	2. Improving the visual aesthetics of internal and external factors of an opportunity.
Remuna NAC aesthetics		
	WO strategies	WT strategies
Weaknesses	1. Improving the natural aesthetics through the artificial approach's kitchen gardening.	1. Improve the weakness as an opportunity.
	2. Decrease the weakness and improved the weakness.	2. Enhancing the external and internal actions.

4.2.2 QSPM matrix analysis

Table S1 and S2 shows that decision-making QSPM matrix, the most effective strategy in Nilgiri NAC on SO1 shows the strongly highlighted strategy for the highest weightage factors on cultural festival richness, historic landscape, and livelihood functions; it is available on the opportunities, given the highest TAS value. Also, ST1 and ST2 perform well. In Nilgiri NAC, institutional strength and planning in urban space counter urban threat strategy. Like market congestion, wildlife conflict, and loss of biodiversity. Because of the environmental landscape, flow can be entirely addressing the redevelopments of culture alone. While, WO got the lower score. The result is opportunity-driven strength based on design for sustainable livelihood and urban growth.

5. Discussion

This research gives a comparative understanding about urban aesthetics between Nilgiri and Remuna NACs. As few literatures gives the subjective and objective aesthetics of it, indicated the urban planning between the original and artificial aesthetic values of the comparative study between the Kufa and Sahla mosques [5]. In urban aesthetics emerging the interaction of formal and symbolic elements of human perceptions and implications [3]. Urban image is essential to the urban aesthetics. Urban image plays a crucial role in shaping the aesthetics in the special identity [80]. Aesthetic landscape not only give the taxonomical variations of different way of life. The beauty of the city has a big effort to feel the special behaviour [45]. In the natural aesthetics of the green spaces of natural aesthetics create a peaceful environment in the city spaces. Nilgiri create a beautiful natural aesthetics value in the city space. Another study also like; the relationship between aesthetics appreciation of nature and developed environments to developments of environments aesthetics [51]. Urban green infrastructure contributes to sustainable cities by evolving the environmental conditions. Support the local economies; provides the economic and urban for sustainable cities. Cultural resilience of the urban community [24]. Aesthetics is

deeply intertwined with SDG goals; with the transformation of emotional awareness, they are essentially achieving sustainable development [32]. The socio-cultural aesthetics play a dynamic role in the city spaces, both the cases Nilgiri and Remuna NACs. Some of the temple aesthetics, wall painting, decorations of shops and different way of market complex vibrant differently. Similarly, reflects human life, behaviour, well-being, functions, and the balances of cultural needs [75] and the vernacular and modern urban design approaches to examine the socio-cultural aesthetics [54]. Institutional aesthetics shape a dynamics role of city spaces such as, road, hospital, collages, school, street light, infrastructure. This aesthetics reflect the institutional presence in the city spaces the public experiences. According to Creed, the institutions aesthetics as a traditional institution's theory. It is also neglected the human sensory capacity to evaluations for "aesthetics mode" of acquired cultural assessments [12]. Shaping their engagement with institutional and spatial arrangement in the city spaces. Between traditional and artificial landscapes comparisons of religious spaces like Sahla mosques and Kufa [5]. In this context, there are few literatures have use in the SWOT and AHP analysis [73]. Using the SWOT and AHP techniques, the weight of urban landscape aesthetics analysed on two NACs on their comparative grounds with the evaluation of AHP. Were also employed the QSPM method for the decision making from the weights of SWOT factors and the analysed matrixes. Both the models given such landscape taxonomy of urban aesthetics. For both the places applied inclusion and exclusion criteria for SWOT result. The threshold of the weights is 2.5, The internal strength and weakness score of 4.967 is better than the opportunity and threat score of 4.131. The strength and weakness score of 3.862 is not better than the opportunity and threat score of 5.392, which is better. The strength of the criteria out weighted the weaknesses, and urban aesthetics was a very excellent status for small order urban spaces in research. We found that the research score was larger than 2.5 score. A recent study on the garden plants is an extensive evaluation of the landscape plants that is given the Hefei, using the AHP analysis [8]. Natural aesthetics play a crucial role in enhancing urban environments by improving people's well-being and overall quality of life. Which directly contributes the SDG 11 [82]. Which is indicated the green space, environmental quality in urban areas [7]. The integration of recreational and historical aesthetics, particularly old temple architecture, increases the social and cultural value of urban spaces. In Remuna NAC, however, unplanned urban growth and market congestion have reduced social harmony and hindered effective development strategies. These challenges highlight the importance of proper planning in maintaining urban aesthetics. The present study identifies natural aesthetics as a significant opportunity for promoting human welfare and improving the visual and functional quality of city spaces. Enhancing the ecological sustainability contribute the environmental resilience, supporting that SDG3 good health and well-being and SDG 15 life on land [7, 13].

In contrast, threats such as the fear of wild animals in Nilgiri NAC affect connectivity to main markets, thereby influencing accessibility and development. Both Nilgiri and Remuna demonstrate the importance of temple-based tourism in shaping urban aesthetics and economic growth. Nilgiri reflects a strong historical and artistic legacy within modern planning, while Remuna exhibits a distinct form of temple aesthetics. Socio-economic aesthetics are closely linked to human behaviour, social interaction, and well-being, as noted by [68]. Similarly, the combination of traditional and modern architectural elements

illustrates the cultural identity of cities [54]. Satellite towns further contribute to urban dynamics by creating new opportunities and enhancing cultural advantages. Improving natural aesthetics through initiatives such as kitchen gardens and urban parks can strengthen environmental quality. However, limited public participation and a lack of literature on small-order urban spaces remain key challenges. The use of a hybrid SWOT–AHP model [79]. This study provides a comprehensive framework to understand and guide the sustainable development of such urban areas.

6. Conclusion

The aim of this study was to examine the structure of aesthetics in small-order urban centres, specifically Nilgiri and Remuna NACs in Balasore, Odisha. A mixed-method approach was adopted, including ethnography, SWOT analysis, and QSPM, to evaluate both internal and external factors influencing urban aesthetic quality and management. The SWOT analysis identified key strengths, weaknesses, opportunities, and threats, while the QSPM matrix helped prioritise strategic planning based on weighted evaluations. The findings reveal that Nilgiri NAC demonstrates relatively stronger internal and external influences on urban aesthetics. Its internal factor score (4.967) and external factor score (4.131), both above the benchmark value of 2.5, indicate favourable conditions and strong strategic potential. Strengths outweigh weaknesses, creating a positive environment for aesthetic and sustainable development. It contributes to the achievements of sustainable development goals by promoting well-planned and inclusive resilient small order urban spaces, especially supporting SDG 11 (Sustainable cities and communities), which highlights that small and medium-sized cities are sustainably planning and improving the quality of urban life. In contrast, Remuna NAC shows comparatively weaker internal conditions, with a score of 3.862. However, its opportunity score (5.392) exceeds threats, suggesting significant potential for improvement through appropriate planning strategies. Key challenges identified in Remuna NAC include congestion in small urban spaces, unplanned market growth, and limited recreational aesthetic development, all of which negatively affect social value and urban experience. Enhancing natural aesthetics, preserving historical landscapes, and developing recreational spaces, particularly around temple areas, can significantly improve visual quality and social well-being. These improvements directly support SDG3, good health and well-being. It is creating more pleasant urban environments for visitors and residents. Within urban areas, there is also SDG15, life on land, by the conservation of local ecological resources and green spaces. Overall, the study highlights the need for better spatial planning, reduced congestion, and increased focus on natural and cultural aesthetics to promote sustainable urban development and social harmony in small-order urban centers. By integrating aesthetic planning with social protection and environments, small-order urban centers contribute to multiple sustainability development goals at the local level.

Abbreviations

NAC **Notified Area Council**

ULB **Urban Local Bodies**

SWOT Strength Weight Opportunity Threat

AHP Analytic Hierarchy Process

QSPM Quantitative Strategic Planning Matrix.

Declarations

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Credit authorship contributions

Rojalin Das: Writing original draft, review and editing, visualizations, methodology. **Sasmita Rout:** Supervision, conceptualizations, writing original drift, field survey, methodology, validations. **Sankar Paul:** Methodology, visualizations, conceptualizations, editing original drift. **Rabi Narayan Behera:** Supervision, conceptualizations, field survey.

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Data availability

Data will be made available upon reasonable request from the author.

Consent to participate

Informed consent was obtained from all individual participants involved in the study.

Consent to publication

Not Applicable

Ethical Approval

This study was approved by the committee on ethics of research on ethics in researches, Departmental Ethical Committee of the Postgraduate Department of Geography, Fakir Mohan University, Odisha. (Approval Number: FMU/GG/ IV-09/86A/2023 dated 10.03.2023). This protocol was granted exempted review status as the research was determined to be of minimal risk to human subjects and does not

involve human trial. This study was conducted in accordance with the ethical standard and the principles of the Helsinki, and the Belmont Report declarations and its later amendments.

Ethical guidelines

The study was conducted in accordance with established ethical standards and the principles of the Declaration of Helsinki and the Belmont Report, including their later amendments.

Competing Interests

The authors confirm that they have no competing interests.

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Figures

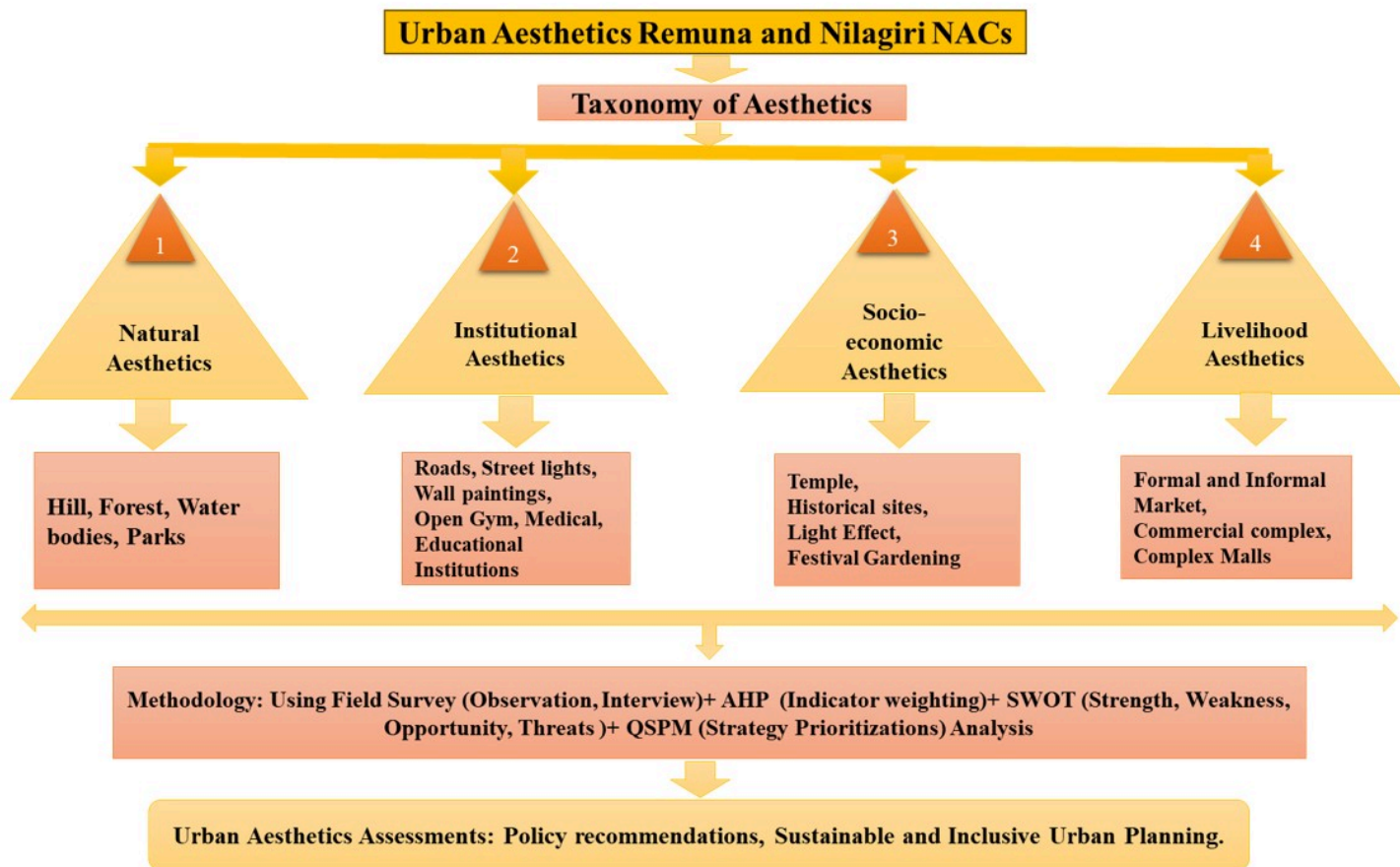


Figure 1

Methodology used for understanding the aesthetics of two selected ULBs of Balasore District, Odisha.

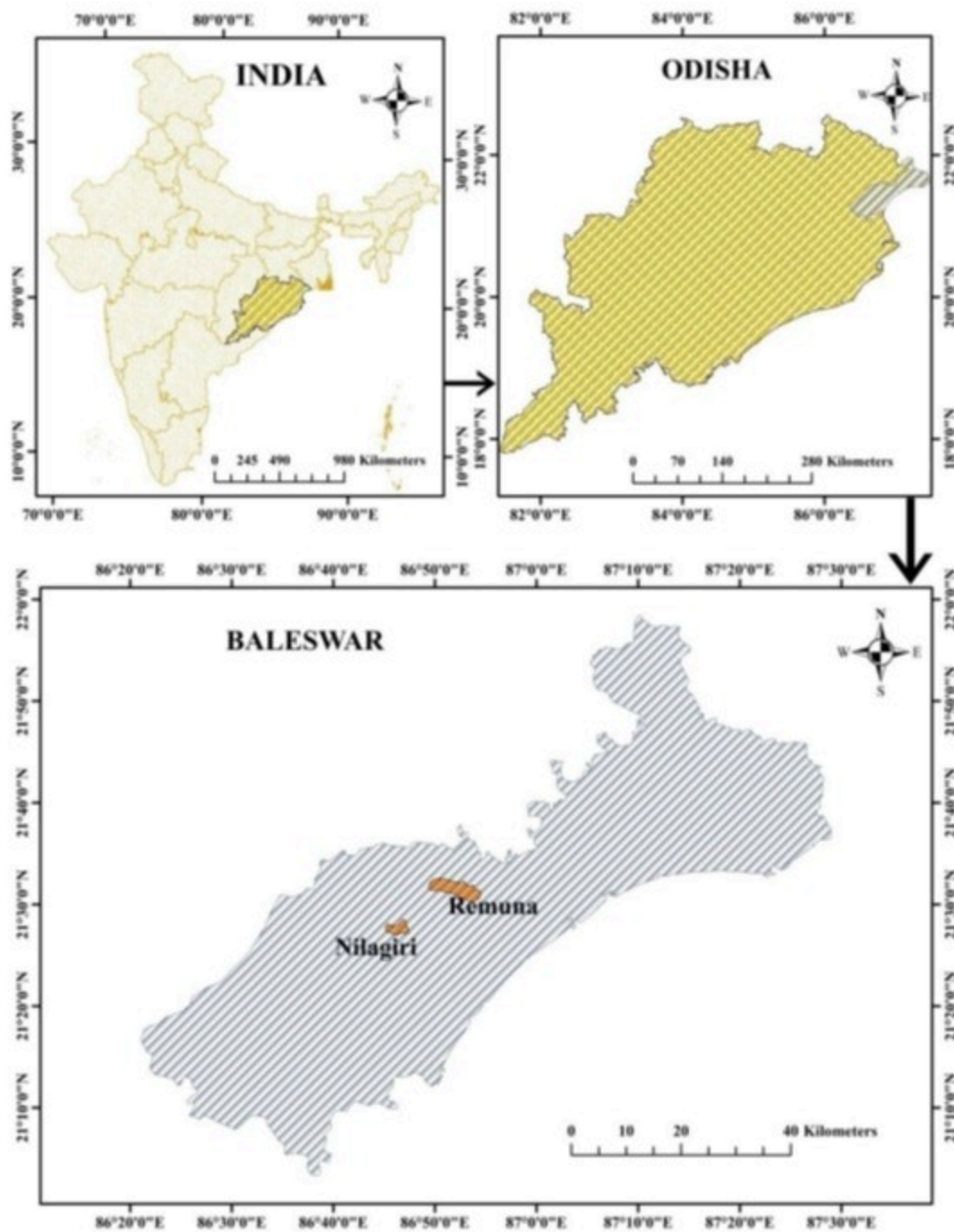


Figure 2

Study area map: Remuna and Nilgiri NACs, Balasore.

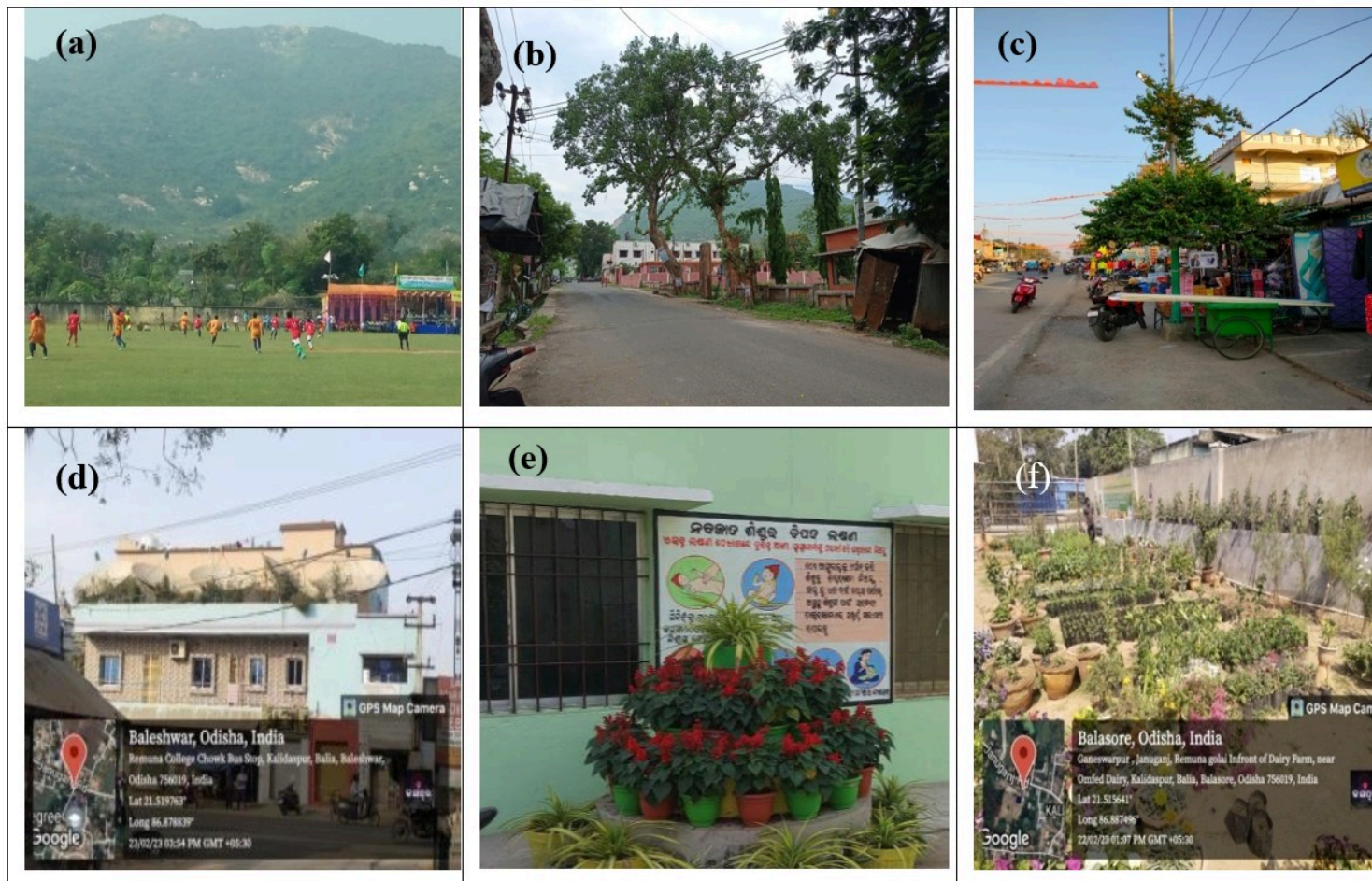


Figure 3

Fig. 2. Visual Natural urban Aesthetics: (a) Hill aesthetics at Nilagiri ULB; (b, c) Green covers along the road of Nilagiri ULB as a part of natural aesthetic; (d) the night view of roads with street lights, and trees at Nilagiri ULB; (e) trees used as aesthetic as well as a shade by shopkeepers at Nilagiri ULB; (f) Urban kitchen garden in Remuna ULB.

Source: Field survey by author (2023-24)

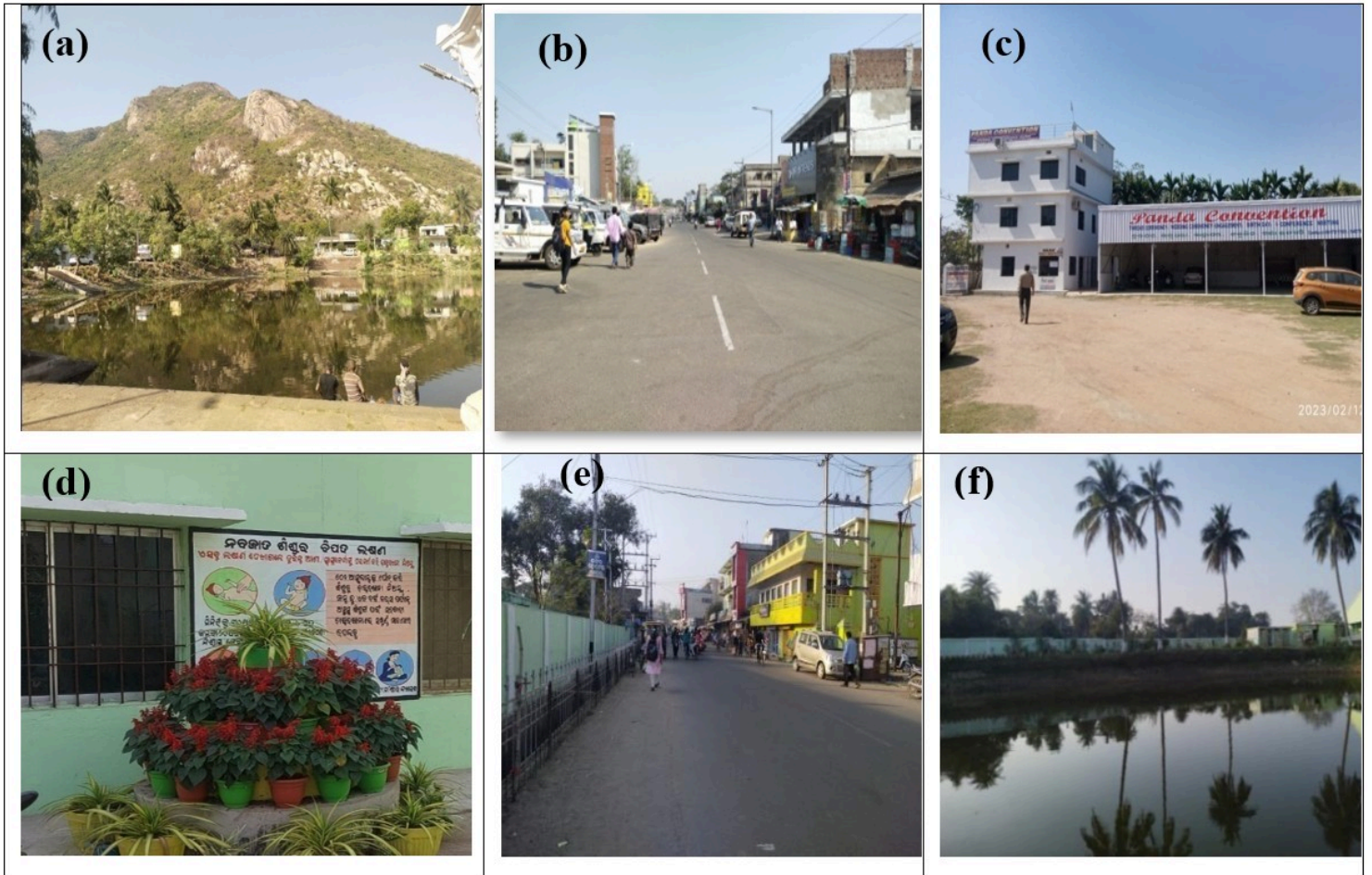


Figure 4

Fig. 3. Taxonomy of institutional aesthetics. a). pond aesthetics, b) Adarsha pond, c). panda amusement Park, d) Hospital aesthetics, e) Wide-road aesthetic Remuna ULB, f). Adarsha pond aesthetics.

Source: Field work by author (2023-24).



Figure 5

Fig. 4. Socio- cultural aesthetics: a, c). Nilagiri jagannath temple aesthetic. b) Bhudhar chandi temple aesthetics at Nilagiri, d) Remuna Jagannath temple e) Remuna khirachora gopinath temple, f) Siva temple aesthetic Remuna ULB.

Source: Field work by author (2023-24).



Figure 6

Fig. 5. Taxonomy of livelihood aesthetic; a). First food shop of Nilagiri ULB, b) Infront of Jagannath temple night view, c) Shop night view, d) Three stored building with restaurant, e) First food stall, f) Night view shops.

Source: Field work by author (2023-24).

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