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SENSORY URBANISM - A multi-sensorial framework for reading the Market streets

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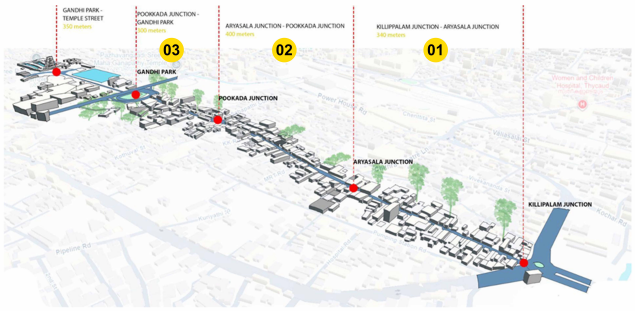
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INTRODUCTION AND AIM

Urban spaces are commonly understood and designed through a visual-centric approach, where emphasis is placed mainly on aesthetics, spatial form, and visual order. However, cities are experienced through multiple senses including sound, smell, touch, movement, and thermal comfort. A multisensory approach to urbanism recognizes the city as an embodied experience shaped by sensory perception and emotional connection. Market streets in Kerala represent some of the richest sensory environments, where commerce, religion, movement, social interaction, and cultural activities together create distinctive urban experiences. Despite this, existing urban design policies rarely address non-visual sensory dimensions such as soundscapes, smellscapes, or tactile comfort.

AIM

To develop a multisensory mapping framework for market streets in Kerala based on contextual sensory cues.

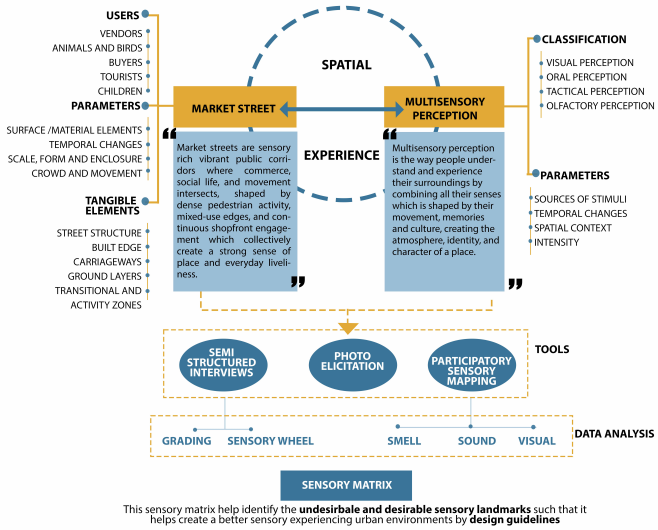


Chalai Market, located in the historic core of Thiruvananthapuram, is one of Kerala's oldest and most active market streets, known for its dense commercial activity and vibrant sensory character. The market functions as a dynamic multisensory environment shaped by layered soundscapes of bargaining, traffic, vendor calls, and religious activities, along with smellscapes of spices, food, flowers, and fresh produce. Narrow street sections, mixed-use frontages, pedestrian congestion, and constant movement create intense visual, tactile, and thermal experiences. These overlapping sensory conditions make Chalai an ideal study area to understand how multisensory cues influence navigation, comfort, social interaction, and place identity within Kerala's market streets.

METHOD

The study adopted a qualitative and experiential methodology combining literature review, sensory ethnography, and field-based mapping techniques. The research began with a review of visual and non-visual urban theories by scholars such as Kevin Lynch, Juhani Pallasmaa, Sarah Pink, and R. Murray Schafer to identify key sensory parameters and analytical tools. Based on this theoretical foundation, a multisensory framework was developed using visual, auditory, olfactory, and tactile indicators. The framework was applied to the Chalai Market area along a 1.2 km sensory route divided into three segments. Methods included sensory walks, participatory observation, semi-structured interviews, binary surveys, soundscape mapping, smell mapping, photo elicitation, and sensory intensity grading. Data were analysed through comparative evaluation of positive and negative sensory experiences.

THEORETICAL FRAMEWORK

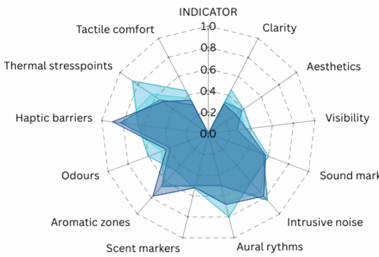


This sensory matrix help identify the **undesirbale and desirable sensory landmarks** such that it helps create a better sensory experiencing urban environments by **design guidelines**

RESULTS AND DISCUSSION

The positive sensory cues identified along the route included temple bells, conversations, vendor calls, aromas of flowers and spices, food preparation smells, vibrant street activities, and visually active commercial frontages. These sensory elements contributed to familiarity, cultural identity, and social vibrancy within the market streets.Negative cues including intrusive vehicular noise, congestion, visual clutter from signage and overhead wires, waste-related odours, poor walkability, and thermal discomfort caused by exposed surfaces and traffic. The analysis also identified sensory hotspots where particular cues became dominant, such as temple precincts acting as positive sensory anchors and traffic junctions becoming zones of sensory overload. The findings demonstrate that non-visual sensory cues play a major role in shaping urban experience and can provide valuable insights for human-centred urban design and planning strategies.

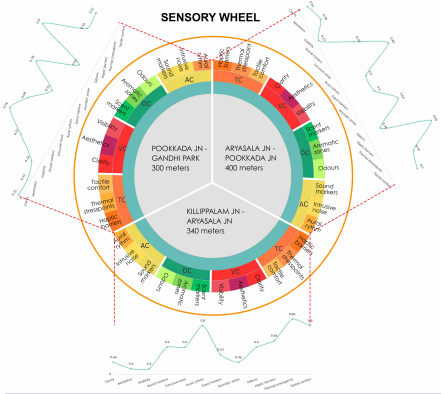
DOMINANT SENSORY CHARACTOR

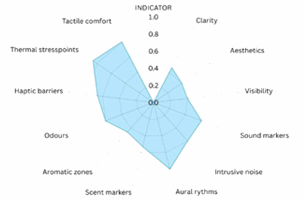


SENSORY MATRIX

STIMULI	INDICATOR	STREET A-B	STREET B-C	STREET C-D	OVER ALL SCORE	DOMINANT SENSORY CHARACTOR
VISUAL CUES	Clarity	0.46	0.33	0.31	**0.37**	Visual clutter,Barriers
	Aesthetics	0.4	0.38	0.31	**0.36**	
	Visibility	0.4	0.27	0.36	**0.34**	
SOUND CUES	Sound markers	0.6	0.55	0.57	**0.57**	Intrusive noise, Aural rythms
	Intrusive noise	0.6	0.83	0.78	**0.74**	
	Aural rythms	0.8	0.5	0.68	**0.66**	
SMELL CUES	Scent markers	0.53	0.5	0.52	**0.52**	Aromatic zones
	Aromatic zones	0.46	0.66	0.78	**0.63**	
TACTILE CUES	Odours	0.6	0.38	0.42	**0.47**	Haptic barriers, thermal stresspoints
	Haptic barriers	0.66	0.83	0.9	**0.80**	
	Thermal stresspoints	0.86	0.55	0.52	**0.64**	
	Tactile comfort	0.45	0.3	0.35	**0.37**	

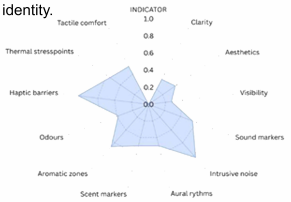
Normalized values between 0 and 1 were used to represent the intensity of each sensory indicator, enabling radar visualization and graphical interpolation. These quantified indicators were compiled into a sensory matrix, where rows represent sensory cues and columns represent street segments. The matrix helps identify dominant sensory conditions, stress points, desirability patterns, and variations across the streets.





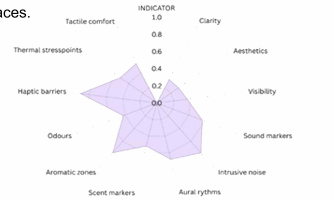
Street 1 (Killipalam to Aryasala)

This segment is characterized by strong tactile discomfort and thermal stress, indicating heat exposure, uneven surfaces, and microclimatic discomfort. Olfactory cues remain weak, with low presence of scent markers and aromatic zones. Visual clarity, aesthetics, and visibility are also low, reflecting poor signage, visual clutter, and weak landmark identity.



Street 2 (Aryasala to Pookada)

This segment shows the highest level of intrusive noise among all segments, with continuous aural rhythms dominating the sensory experience. Aromatic zones and scent markers are more prominent, creating a strong olfactory character. However, visual clarity and aesthetics remain low, while high haptic barriers indicate obstructions and uneven walking surfaces. Thermal stress is moderate due to the lack of shaded or covered spaces.



Street 3 (Pookada to Gandhi park)

This segment is dominated by high intrusive noise and tactile discomfort. Moderate scent and odour presence is observed, while the highest level of haptic barriers indicates poor walkability due to obstacles, narrow pathways, and uneven surfaces.

CONCLUSION

The study concludes that urban experience extends far beyond visual perception and that market streets should be understood as multisensory environments shaped by continuous interactions between people, activities, and sensory stimuli. The developed multisensory mapping framework successfully documented sensory experiences through observational analysis, sensory walks, and participatory methods. The research highlights the importance of integrating sensory perception into urban design to create more inclusive, comfortable, culturally responsive, and emotionally engaging public spaces. By identifying both desirable and undesirable sensory conditions, the framework provides a foundation for developing context-sensitive design guidelines for Kerala's urban environments.

FUTURE WORK

Future research can expand the framework into other urban typologies such as waterfronts, tourism districts, heritage precincts, and public open spaces. The study can also be integrated with GIS-based sensory mapping tools and digital technologies for advanced spatial analysis. Further exploration of seasonal and temporal sensory variations can strengthen the understanding of changing urban experiences throughout the day and across different climatic conditions. The framework also has potential applications in inclusive urban design, tourism planning, and sensory-sensitive policy development.