TROPICAL URBAN PRECINCTS AS SOCIO-ACTIVITY AGGLOMERATIONS IN THE MICROCLIMATES OF COLOMBO

A Dissertation

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Declaration

I declare that this dissertation represents my own work, except where due acknowledgement made, and that it has not been previously included in a thesis, dissertation or report submitted to the University or any other institution for a degree, diploma or other qualification.

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Tropical Urban Precincts as Socio-Activity Agglomerations
in the context of the Urban Microclimate of Colombo

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Introduction

Architecture is *the* spatial art. The experience of a work of architecture begins from outside and progresses inside through the progression of spaces. In this process of experience, the beholder is made physically and psychologically comfortable. This aspect is central to any built form whether it is a single building, a neighbourhood or a cityscape. A cityscape is crucial in the provision of comfort levels as massing or congregation of building could trap heat and generate micro climatic conditions with very high urban heat islands and thereby curtail the experience of architecture from outside. Lack of an appropriate massing of buildings in Sri Lankan urban settings is a common phenomenon, which has lead to the physical and psychological discomforts of the city inhabitants. The focus of this study therefore is the exterior of cityscape and its comfort levels in the experience of architecture. It explores the way in which outdoor-life and life in between buildings contribute to activating and enhancing urban life in the context of urban micro climatic conditions.

The hot and humid tropical climate gives rise to a paradoxical situation in such a way it both contributes to and constrains outdoor life. When the outside temperature is warmer often with bright sunshine it induces outdoor-life. Yet, the associated extreme humid levels make outdoor life uncomfortable. There are spatial pockets however, both designed purposefully and created by the way certain spaces are used over time, which mitigate these contradictions and enhance outdoor life and its diverse activities. These pockets are defined in this study as urban precincts. They are highly populated and with distinct characters derived from their spatial formation, diverse activities and activity tiers, which have been identified as 'necessary', 'optional' and 'social'. A space is first occupied by an activity or a set of activities, which are 'necessary' to be performed. These include specific functions for which they are designed and intended. At the same time there are certain activities that take place within the same space, which are 'optional'. There are also certain spaces, which induce activities beyond the necessary and optional levels to encourage 'social' functions such as community gatherings, discussions and events. Such activities are closely integrated with one another and with the whole to make the space active and dynamic. This web of activities and their integration is termed in this study as 'socio-activity agglomerations'. For instance, a person could come to a place of worship to perform a religious function. This is the necessary function of the space. If the space is (first and foremost) thermally comfortable s/he may also opt to stay longer relaxing for some time and thereby it

becomes an optional activity. If its comfort levels facilitate broader physical and psychological comfort levels, it could also induce diverse social activities by which s/he can interact with others. When that tier of interaction is fulfilled at each level facilitating physical and psychological comforts, the place of worship becomes an urban precinct.

Fusion of such activity tiers within an urban precinct and integration of urban precincts in a spatial network make cityscape comfortable, lively and dynamic. They invariably encourage socio-activity agglomerations. Deeper understanding of and responding to urban microclimatic conditions in architectural and urban spatial designs are therefore central to experience cityscape in its totality.

A. Significance of the Study

Steady rise of urban built densities in cityscapes has manifold consequences. Firstly it creates urban heat islands with significantly higher temperatures. This draws people out to open spaces, however, very high humidity levels make such spaces uncomfortable. Secondly, the demand for space to build eats up the open spaces and steadily shrinks the presence of urban precincts. This in turn aggravates urban heat and confines people only into activities that are necessary to be performed. Especially in Colombo gross inadequacy of architectural and urban design efforts makes its cityscape haphazard and pushes people towards outskirts for optional and social activities. Although Colombo core area: Fort and Pettah are looking busy and populous, people often confine to necessary and optional activities only. Physical discomfort and fatigue have become common phenomena. Moreover, these areas have become 'dead' spaces after a certain time of the day. In this context, minimising the constraints of tropical climate while maximising its potentials is of central importance to make city diverse and rich as a liveable urban spaces.

B. Intention of the Study

The intention of this study is to identify the salient characteristics of urban precincts that address issues of urban microclimatic conditions and thereby encourage socio-activity agglomerations. Based on these characteristics guidelines for meaningful architectural and urban design interventions to ensure a responsive cityscape has been developed.

C. Study Hypothesis

Urban precincts have a high degree of thermal comfort, which mitigates urban heat and thereby induces socio-activity agglomerations. Therefore, the presence of urban precincts has a strong relationship with the socio-activity agglomerations of cityscape.

D. Objectives of the Study

- To explore the relationship between thermal behaviour and outdoor activity patterns and establish its relevance for socio-activity agglomerations, which encourages a responsive cityscape
- To develop a set of design guidelines for urban precincts

E. Scope and Limitations

The scope of this study is limited to identifying socio-activity agglomerations of tropical urban precincts within pertinent urban micro climatic conditions. In so doing, it explores the activities that take place within an urban precinct and their inter-relationship with the outdoor thermal comfort levels. The socio-activity agglomerations are classified into three activity tiers as 'necessary', 'optional' and 'social' with each activity tier having increasing social responsiveness and a sense of informality. The study seeks the way in which outdoor thermal comfort levels are related to these activities.

The socio-activity agglomerations of a particular cityscape and an urban precinct are diverse and inter-related. They change with time and space. They differ within the day with the change of temperature and humidity levels, within a season of a particular year with climatic variations such as rainy and dry seasons. They also change with long passages of time due to a host of factors ranging from socio-economic, cultural and political spheres. For instance, different economic activities encourage different activity patterns and different communities have distinct attitudes and value systems that generate different patterns of socio-activity agglomerations. They are therefore in a continuous pattern of change and progression and can hardly be streamlined into regimented classifications. This poses a major limitation of the study. Nevertheless, within such a continuity of activities classifications can be made at broader levels, which have been cited in this study as 'necessary', 'optional' and 'social'.

These activity tiers are inextricably intertwined and have reciprocal relationships. This study does not detail out such aspects, yet, may discuss them only in the context of the study focus. The activity tiers are discussed in detail within the urban micro climatic conditions only. Within the climatic conditions too, there are variations during the year. This study is limited to its most crucial period; February to April, which records the highest temperature in the Colombo's cityscape. Measurements were taken only for 2005 but for more accurate conclusions taking the measurements for few years is necessary.

Thermal comfort, while being experienced by humans in a similar pattern (as against other animal species), it has also a distinct personal dimension. It roots down to individual level due to specific biological conditions. Its effects too vary on psychological conditions of a person and as a whole within a chosen urban precinct. However this study does not get into the intricacies of such aspects. It only takes people as groups (and not as individuals) respond to thermal conditions and spatial formations of urban precincts.

Within such groups of people there are 'Thermal Heat Index' (THI) values, which indicate a broader range of thermal comfort. THI values are based only on ambient temperature and relative humidity. In addition Predicted Mean Vote' (PMV) values are taken into account in order to get the thermal comfort conditions that suit the majority of a group of people. Due to lack of information on Sri Lankan situations, THI and PMV values have been judged based on the indexes developed for different indoor and outdoor conditions in Europe. This gives rise to another limitation of this study.

Psychological comfort levels vary immensely from person to person and by her/his present frame of mind. It is difficult to be measured by the method adopted by this study. Therefore, this study is limited only to the premise that physical comfort leads to psychological comfort and physical comfort is an essential prerequisite to achieve psychological comfort.

F. Method of the Study

A case study method has been used covering three urban precincts in Pettah. They are the Old Town Hall in Kymans Gate, Bo Tree Junction and the Jami Ul Alfar Moaque at the 2nd Cross Street. These three precincts portray three distinct urban settings and people are using them for several decades. Their usage for over a long period has converted them into well-utilised public spaces. Initial observations show that they encourage socio-activity agglomerations at different times of the day.

The study is evolved into three phases. Firstly through observations the presence of activity tiers was adjudged. Secondly random measurements were taken to seek whether there is a relationship between such activities and the thermal characteristics of the space. Once it was identified, in the detailed case studies, the precinct space was projected onto a hypothetical grid to gauge the distribution of the identified activities and thermal characteristics. Observation and photographic surveys were carried out to supplement the relationship between thermal characteristics and activity pattern.