

## ECOLOGICAL PARADIGMS IN PLANNING THE LIVEABLE CITY

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### **Abstract**

Sustainability is currently the most pressing, complex, and challenging agenda faced by the city. The focus of sustainability has turned on to wider issues of environment, ecology and people. Eco-city as a concept has played a vital role in designing new habitats in the city. In the context of promoting nature as bio-centric entity that controls itself, the eco-city has become a life-territory, a place defined by its life forms, topography and biota, rather than by human activities. As a result the concept of eco-city is over-dependent on the carrying capacity of land, thus paralyzing the growth of the city and its social evolution. We intend to test the strength of the evolved city culture as a reliable tool in shaping strengthening the liveability of the city. In Sri Lanka, cities have been built as political cum religious polis since antiquity and they pretty much yet remain politically-centred, fragmented and nature-represented. Although, the Sri Lankan city is full of trees, it is not *green* as a living space because the illegible city form is distancing from society. Our research, through a literature review and a field study carried out in the city of Panadura, intends to test new paradigms that make the city a strengthened living container. We find that the socio-culturally defined ecological footprint is a useful tool in reinforcing city's liveability.

**Keywords:** Eco-city, ecological-footprint, cultural-planning, carrying-capacity, Sri Lanka

### **INTRODUCTION**

Sustainability is currently the most pressing, complex, and challenging agenda faced by the city. Expanding urban population across the globe has turned the focus of sustainability from being simple concerns such as global warming or depletion of non-renewable energy into a wider issue of environment, ecology and people. Idea of sustainable development launched by the World Summit on Environment and Development of 1983,<sup>28</sup> and the Earth Summit of 1992, redefined ecological-sustainability as a key word in city planning. Eco-city and Green Architecture have come to play a vital role in designing new habitat of the urban society as a result.<sup>29</sup>

Cities are living containers designed to promote good life. Liveability is the most man-oriented scale to measure the quality of life in the city. Ecological sustainability improves the liveability of the city for linking man and his society with the environment. Our attempts shall aim at evolving the *correct* balance between the nature where the city is located and human action that impinge on the city.<sup>30</sup> The linking of *good city life* with ecology gave birth to the idea of Eco-city defined with nature, its resources and their continuity in pristine form without sacrificing the will and strength of an evolving urban life. In the context of promoting nature as a bio-centric entity that controls itself, the Eco-city has become a life-territory, a place defined by its own life forms, topography and biota, rather than by any human activities. This tendency to make Eco-city over dependent on the carrying capacity of land hampers the evolutionary process of the human habitat. The concept of carrying capacity, having defined from usability of land in agriculture, places undue emphasis with materialistic values of

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<sup>28</sup>. *Our Common Future* (1987) World Commission on Environment and Development, London: Oxford Press

<sup>29</sup>. These concepts intend to create habitats with minimum environmental impact: minimized requirement of input resources and controlled waste out. Richard Register coined the term Eco city in his book, *Eco-city Berkley: Building Cities for Healthy Futures*, published in 1987.

<sup>30</sup>. One shall not confuse the idea of Eco-city as bringing the elements of countryside to the city. Lefebvre (1996:87) notes the differences, "the countryside, both practical reality and representation, will carry images of nature, of being, of the innate. The city will carry images of effort, of will, or subjectivity, of contemplation, without these representations becoming disjointed from real activities".

natural resources at the expense of qualitative aspects such as culture, society, threatening city's continuity and diversity.<sup>31</sup>

Management of natural resources, use of ecologically-friendly materials, use of renewable energy sources, and such quantitative aspects of ecological sustainability are being taken care of at the expense of qualitative aspects such as city form, lead-built forms, land use, potential growth patterns that necessarily represent the living society. As a result, one may observe the degradation of city's capacity to contain its life thus becoming sterile and stereotyped. Society failing to find its place in the city is forced to inhabit the space rather than dwelling it. Having noted the need to balance the quantitative-bias approach with a qualitative-oriented catalyst for growth, we intend testing the strength of the evolved city culture as a tool in shaping a new paradigm shift that would strengthen the liveability of the Eco-city.

Cultural dimension in city designing notes a critical question in pursuing sustainability. Culture and cultural activities have been displayed in the city since antiquity reinforcing the continuous evolution of the both city and society. As such, a lived city, with its layers of cultural deposits, attests to a diversified city culture. Culture is the whole set of values, ideas, meanings, symbols, and organisational rules of a society reflected in its institutions, and using the environment to support its social relationships. The lack of orientation to accommodate the cultural dimension in shaping cities has resulted in the loss of place-identity and the representation of evolving society as it is clearly visible in many Sri Lankan cities. We observe the degradation of city life as a result of paying attention on the growth or its control rather than its pattern.

City may further lose its liveability if the universally-defined concept of Eco-City is enforced without integrating socio-cultural interests. By bringing the society and culture into the centre of decision making with regards to city planning, a holistic approach could be formulated to protect the uniqueness of the city. Scott (2000:30) notes, "Place and culture are persistently intertwined with one another, for any given place... is always a locus of dense human relationships, and culture is a phenomenon that trends to have intensely local characteristics thereby helping to differentiate places from one another". The significance of the culture in the planning the Eco-city has been discussed in many forums. Since the carrying capacity of land is mostly decided upon geo-physical conditions of the land, the strength of the socio-cultural context has been largely neglected and city development has been attempted on a piecemeal basis. The point of departure of our research is the resulted *place-less* city. We intend to look at the practice of the concept of Eco-city to prepare the ground works for integrated planning that may bring about a liveable city.

Our aim is looking at the new paradigm called Eco city and to assess its strengths in reviving the Sri Lankan city as a living place.<sup>32</sup> We scrutinized the concepts of Ecological Footprint, Smart Growth, New Urbanism, and PLACE3 that complement the strengthening of the liveability of the city. Our primary objective has been carrying out an in-depth analysis of the Sri Lankan city in terms of its liveability and growth, and collecting and processing data in relation to the concept and practice of Eco-city. Then using, testing, and disseminating the processed data we intend, as an end result, to outline a method of analysis to study the liveability of city form.

The other objectives realized are: Reviewing literature and producing them into a useable format: Preparing a checklist for assessing city planning: Shaping design briefs to inform prospective developers and designers of the possible Eco-appropriate growth patterns: Enlarging awareness of the developed framework through a set of stakeholder meetings, and as an end product we also aimed at

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<sup>31</sup>. One could easily see that how these conventional means of shaping sustainable environments are becoming rather *stereo-typed* thus risking the making of the Eco-city into a mere *type*.

<sup>32</sup>. Munasinghe (2004) 'Ecological Housing in Helsinki: Case study of Viikki', *Sri Lanka Architect*, Journal of Sri Lanka Institute of Architects, 4/2004

preparing the ground works for the development of educational programmes of modules at primary, secondary and tertiary levels.

### **SRI LANKAN CITY FORM**

“City is a fact in nature, like a cave, a run of mackerel or an ant-heap. But it is a conscious work of art, and it holds within its communal framework many simpler more personal forms of art” (Mumford 1938). No city can stand still and neither has it been dropped down from the sky. It is a dynamic representation of diverse understandings between flesh and stone (Sennett, 1994). The particular socio-spatial matrix of the city shows an evolving value system of man, his society, and the environment. Learning to respect and to respond to the volatile forces of the place, and then evolving designing criteria of less-destructive additions to that place may lay the foundation to the ecologically-sustainable city design. In the case of the city, ecology has more to do with a built environment, functions of its elements, accommodating a society, and its possible growth/change, that together mirror the evolution of a living society. Here one shall pay due attentions to the socio-spatial matrix rather than the individual elements that is the case of *natural* environment, and as such to the involvement of the city life. As such, it is necessary to pay due attention to the society in assessing the impact of designing and building any new extension to the city.

In Sri Lanka, cities have been built as political cum religious polis since antiquity.<sup>33</sup> Although the city form has evolved from antiquity to medieval, then to industrial and post industrial resulted along with the social evolution and diversification, the Sri Lankan city form pretty much yet remains politically or religious centred, and as a space, remains more fragmented and nature-represented. One could thus argue that our cities are already Eco-cities, emphasizing the existence of extensive green patches and low density. This particular state of our city is a reaction to our way of life- majority of us living in the city yet leading a rural way of life, and as such the city has not remained an Eco-city but a mere village. Also, most of us were attracted to the city by pull factors such as employment, infrastructure facilities, etc not through our intention to be urbanized. Having come to live in the city we have re-adapted our rural way of life in a more dense and diversified surrounding but have not paid due attention on the public realm for collective human activities. This is why have not evolved urban activities in the city.

The best example for this type is the fortified city of Galle. The city plan is based on a grid-iron street layout of a defined hierarchical order dominated by the Queen Street, thus depicting the influence of political power. This street provided access to the main trading point and the port. The city form was divided into three quarters: administrative, commercial and residential, and buildings were designed to fit the particular functions and users. Later during the British rule, the commercial quarter was shifted outside the ramparts. British imperialists willing to live in much grandeur, moved out of the fort, allowing the locals to settle down in the residential quarter of the fort. This resulted in a more significant division of the fort between administrative quarter and residential quarter. Identification of the universal heritage values of the Galle fort and its enlisting on the World Heritage List eventually turned it into a place of leisure filled with museums, art galleries, hotels, and holiday homes. The administrative function has been ejected from the fort and the residential function is declining. As a whole, the declaration of Galle fort and the adopted development regulations and restrictions have resulted in degradation of city life.<sup>34</sup> The new urban quarter that accommodates the ejected functions took its reference from the old city and retained the sense of belonging over a long period of time mostly due to its street layout and plot division pattern. However, the new built forms have not responded to the existing character. The city centre trapped in between the two quarters attests to a typical medium size town and does not refer to the glamorous past. Moreover, Galle is full of underused, unused as well as misused built urban spaces, which could easily facilitate the demands of the evolving society without losing ecological balance.

<sup>33</sup>. Refer Ellawela (1969) to understand the emergence of human settlements in early Ceylon (Sri Lanka) and how they developed into urban settlements (pp 115-116).

<sup>34</sup>. Munasinghe (1998) notes the degradation of city life in Galle fort as a result of urban conservation.

In the Sri Lankan city, development is misinterpreted as improvements of economics, thus paying less attention to the social capital. Today, the Sri Lankan city centre is disintegrated due to urban sprawl along the main trunk road, and losing its identity mostly due to mediocre place-less architectural forms that form the enclosure of the said trunk road. With new buildings being built without responding to the true character and identity of the city, the container quality of the urban space is degrading. Furthermore, most of the cities have extensive green spaces, attractive water fronts, many spaces for public activities, socio-cultural resource that could draw an income. The existence of layers as well as the underutilized or unused urban spaces suggests that Sri Lankan city needs a comprehensive integrated approach that identifies its urban precincts and strengthens their particular container quality to restore the liveability of the city.

In fact, the urban society in Sri Lanka has not evolved any collective activities, making the city a living setting nor have we evolved social structures or organizations to support such activities. City is full of *dead* spaces and thus has become a threatening place- littered, covered in graffiti, polluted, congested, plagued, and filled with many non-urban mediocre buildings. Although, the city is full of trees, it is not *green* in terms of liveability.<sup>35</sup> As such, the city has not been able to foster comfortable dwelling. The sprawl in the Sri Lankan city along manor traffic arterials has been unstoppable hence threatening the basic definition of city as a bounded space and attesting to the fact that urban designers have failed to facilitate city's growth. This attests to the grave need to strengthen city's role as a living container to rebuild links between urban society and city.<sup>36</sup>

Preliminary observations had surfaced the possible contradictions of enforcing this concept in the Sri Lankan context. The major conflict comes up with the definition of city in Sri Lanka. It had been noted that the concept of Eco-city had mostly been used in Western contexts. There is a marked contrast in socio-cultural values, social context, social order and organization, and social surroundings once compared with Sri Lanka. Also, the city as a living space as well as the types of urbanism has been different in Sri Lanka. Case study surfaced the need for case-base shaping of the concept and implementation tools of the Eco-city concept.<sup>37</sup> We focused onto a case to learn more of its processes than end results using Strategic Planning, Eco-city Zoning, Proximity Law, Increased Diversity, and Clustered Development as tools to redefine urban ecology. The tools used to implement such criteria are city governance and communicative planning that involves the society in decision making. The strength of these criteria is supporting sustainability and social empowerment, and facilitating responsive environments. These criteria, through an understanding of the unique relationship between life patterns of individuals, their social context and reality, their way of ascribing values with the environment, could revive city's liveability. Our intention is to promote a building process that will necessarily upgrade the living standards of the city by paying due attention on those links between man, society, and environment.

### CONCEPTUAL DEVELOPMENT IN ECO-CITY

Ecological Footprint is a concept adopted in the cities in UK. It is a system of comparing human demand with the ecological capacity of the place, especially in the case of regeneration. It is a further development of the representation of amount of biologically productive land and sea are needed to regenerate the resources a human population would consume and absorb and render harmless corresponding waste.<sup>38</sup> We used this analysis to check the capacity of a city and its built elements in

<sup>35</sup>. Eco-city is defined as the one that enhances the well-being of citizens and society through integrated urban planning and management that harness the benefits of ecological systems.

<sup>36</sup>. Munasinghe (2001) for a discussion on the city and society.

<sup>37</sup>. The Green Finger plan adopted in the developing of the urban district called Viikki in Helsinki is an instructive example for integrated development in which the public participation too was integrated in decision making. Viikki was a *tabula rasa* and a predominantly residential quarter but cleverly intertwined with employment generation and a socio-cultural diversity.

<sup>38</sup>. Wackernagel M. and Rees W.E. (1996) *Our Ecological Footprint: Reducing Human Impact on the Earth*

accommodating the needs and demands of the living society thus testing the morphology of the city: city plan, land utilization and the building stock: solid-void ratio, building types, indoor-outdoor urban spaces, and spatial structure criteria of the city against the demands of the living society that are depicted in the built environment. This analysis prepares the grounds for shaping an integrated development scenario that is place-oriented in scale and in type to determine the reuse and recycling of the built fabric and urban land. The report, *Towards an Urban Renaissance* that notes the economic, social and environmental context as dependable surroundings in designing the footprints is an instructive example such an attempt.<sup>39</sup> Key themes of the report are recycling lands and buildings, improving the urban environment, achieving excellence in leadership, participation and management, and delivering regeneration. As a whole, the report finds the strength of *Ecological Footprint* in making a city of higher quality of life.<sup>40</sup> Our investigation is mostly framed by these themes.

The European Commission adopted the Communication COM (2004) 60, *Towards a Thematic Strategy on the Urban Environment*, of January 2004, setting out the Commission's idea for a thematic strategy on the Urban Environment in summer 2005.<sup>41</sup> The four themes; environmental management, urban transport, sustainable construction, and urban design are at cross cutting with nature and possess many strong links with environmental issues. It must be noted that these principles and approaches may not fit the Sri Lankan conditions as social values, orders, and organizations vary significantly yet would prepare the grounds to develop our own system.

The definition of principles of sustainable development for policy makers given in the Brundtland Report (1987) could be developed for Eco-city planning. They are:

1. Changing current patterns of economic growth, technology, production and management which may have negative impact on the environment and population:
2. Ensuring employment, food, energy, safe water, and sanitary services for all populations:
3. Protecting natural resources for future generations:
4. Integrating economic, environmental and population considerations in policy decision-making and population growth.

Strengths in these principles are referring to place-oriented approaches that may instigate the growth of the city and promote a holistic approach, linking development to society, culture as well as to environment.

We also tested the concept of *Smart Growth*, which has the vision to build an Eco-community through designing extensions in the city. It reinforces the liveability of the city without distorting its conceived images yet guiding the necessary changes demanded by evolutions and development of the society. Smart growth aims at managing the *bounded space* – the city, thus arresting sprawl and directing growth patterns, and allowing one to develop local solutions that respond to the place: the physical as well as cultural context. This can be used to assess and further build up the *social capital* that is not exclusively geared to note the material gains but mostly to include the enhancing spiritual well-being, sense of identity and belonging, social status, honour and prestige (DFID, 1999).<sup>42</sup> This concept as such would respect the evolved morphology of the city. *Smart Growth* is a useful tool for planning the ecologically sustainable city. It advocates that the growth itself should be tied to the quality of life and how and where it should be persuaded and, as such *Smart Growth* touches the crux of the said principles. This can be defined as the practice of integral quality: including economic, social and

<sup>39</sup>. [www.eukn.org/unitedkingdom/themes/Urban\\_Policy/Towards-an-urban-renaissance-final-report](http://www.eukn.org/unitedkingdom/themes/Urban_Policy/Towards-an-urban-renaissance-final-report), The report was written by the Urban Task Force headed by Lord Richard Rogers

<sup>40</sup>. Our data suggests that most of urban lands and buildings (about 43%) in Sri Lankan cities are either unused or underused. The reasons being buildings outliving their functions and societies, and uncertain political visions beside the uneven urbanization patterns.

<sup>41</sup>. [Ec.europa.eu/environment/urban/pdf/Sec\\_2006\\_16\\_en.pdf](http://Ec.europa.eu/environment/urban/pdf/Sec_2006_16_en.pdf)

<sup>42</sup>. DFID (1999)- *Social Capital: Overview of the Debate*, [www.oneworld.org/odi/keysheets](http://www.oneworld.org/odi/keysheets)

environmental performances in a broader way. The rational use of natural resources and appropriate management of the city will contribute to saving scarce resources, reducing energy consumption and improving environmental quality. *Smart Growth* can be used to essentially involve the entire life cycle of the city, environmental quality, functional quality and future values. It is important that the authorities note the qualitative aspects of the built environment. If properly planned as representations of an evolving socio-cultural discourse, the built environment could be resource efficient, energy efficient, pollution preventing, harmonising with the natural environment.<sup>43</sup>

*New Urbanism*, the other concept that we investigated, is known for rebuilding the degrading city since it emphasizes on the creation of public realm and not reserving space for motor car. Harvey (2000:169) notes "It (new urbanism) attempts intimate and integrated forms of development that bypass the rather stultifying conception of the horizontally zoned and large-platted city. ... It also permits new way of thinking about the relation between work and living, and facilitates an ecological dimension to design that goes beyond superior environmental quality as a consumer good". However, there are many who challenge this movement as nostalgic. They are sceptical about the other similar attempt, Urban Village, led by Prince Charles in Britain, as the locus of urban regeneration. Among the issue put forward by these sceptics is the dwindling growth and change as a result. There is no guarantee that the people are that keen to live in communities with strangers who live in their neighbourhoods, and as such the urban environment cannot facilitate community formation to the extent of the village. As a whole such attempts may again lead to urban utopia, including some people while excluding the others. *Smart Growth*, as a concept, seems to have learnt from these lessons to create a balance in the city by facilitating a diversity that is unique to the place. As such, our aim is to test the strength of this concept in the context of Sri Lankan city in order to managing, reinforcing or even rebuilding the liveability of those city centres focussed through case studies.

Our intention has been to test the strength of these concepts in achieving the eco-city. We have tested a living city in terms of its capacity to cater the demands of the evolving society. It has been noted as important to discuss the sustainability of the city in terms of its lived life and the lives that will come in the future.

## **ECOLOGICAL FOOTPRINT OF SRI LANKAN CITY**

Sri Lankan cities are either colonial-found or emerged on major traffic arterials. The colonial-found cities are typical medieval city centres where trade was given priority along with political power. They were mostly planned around a main street where trade activities took place, but the political hub has been at the core of the main street.<sup>44</sup> The colonial city was planned as an extract-point for the surplus made in the countryside that was noted as a hostile landscape. The resident colonial community demanding a higher sense of security, the city was protected with physical barriers such as ramparts, moats, etc. The city forms evolved with the change of colonial powers and their relationship with the local community.

Panadura is a town centre that was developed as a way-side stop-over on the Galle road. It may have been a port-town as the river meets the sea there, and there was a famous ferry. The Dutch built main street proves that this town would have been largely shaped by the Dutch as an extract point to gather cinnamon. The town has a particular morphology with a city plan dominated by the main street used for trading activities and there are secondary streets starting off the main street. This main-street dominated linear city form is a typology of a wayside town in which trading was the primary function. The urban wall of the main street is dominated by a dual-function two story built form, in which the lower floor was used for trading and the upper floor was the residential quarters. The particular form

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<sup>43</sup>. This integrated planning shall be achieved at different levels: policy level, planning level, spatial development level, and at last building level. The built environment as a whole shall note the uniqueness of the place where they are built and then strengthen the particular genius loci in order to strengthen the container quality of the city space.

<sup>44</sup>. Munasinghe (1992)

of the building type, that still dominates the main street, further attests to city's evolution into a main trading port. More importantly, this trading town was not a haunted one in the night with a permanent population residing within the city centre. The Dutch origin of the built form and its abutting the main street marks another era of urbanisation in Sri Lanka. The spatial structure criteria of the city form have accumulated layers of living experience of post-Dutch societies. The commercial centre of the city started to diversify as a result, thus relegating the cinnamon trade to a minor activity. The said shop houses became just commercial building, ejecting the residential function towards the east of the city. As a result the city form transformed from a linear one to a centric one adding new urban quarters. The main street dominated the spatial structure criteria of the city. Panadura retained its significance during the British as a mini administrative centre. The affluent society emerged during this period, and they built manor houses outside the city, thus further diversifying the city centre.

As the main street was not sufficient to accommodate the growing traffic needs, a four lane road was added by cutting through the edge of the city in the post-independent era. Later, this *new* Galle road became more significant for touching the major transport hub: the Bus station, thus attracting the commercial activities out of the main street. The main street was returned to simple and quiet trading activities that are sought by the local residents while Galle road becoming the *busy* central business district. The city began to evolve between the two arterials, acquiring a new identity without losing its original sense of belonging on which the city life could depend. Many public facilities such as Hospital, Library, Town Hall, Bus station, Police station, etc were added to the urban district between the two roads while banks and other commercial institutions establishing themselves along Galle road. This development necessarily created a rather busy character along the Galle road. The meeting points of the two streets importantly started to dictate the bounded nature of the city as the visitors always identify the arrival in the city with these two points. Most of the local citizens frequently move between the two streets: the main street and Galle road. As a whole this new layering of Panadura diversified its urban character.

The overpowering nature of the new economic activities located and the changes in social values have shifted the residential functions out of the city centre. Simple specific trading activities of the main street do not demand the occupation of the upper floors of the dual function buildings. At the same time, some traders sought replacing these buildings with new taller structures. Today, the upper floors of the old buildings are mostly empty. With Panadura becoming a major urban hub that would retain the over spilling populations of Colombo and with the travelling of Galle road becoming more diversified, the city started to sprawl. The city form started surpassing its identified edges, residential function growing towards east thus colonising more new lands and commercial functions causing a ribbon development along Galle road. This ribbon development challenges city's bounded nature to extent of distorting Panadura's unique identity. Today, the city centre that evolved around Galle road and its shopping district depict a typical wayside town, built to pass-by rather than to contain social and living demands. There is a grave need to identify an integrated development strategy based on the transforming morphological elements: city form, land utilization and built forms. Retaining the quality of a bounded space and restructuring the forcefully-emerged spatial structure are also essential.

Among the most detrimental to Panadura has been the sprawling along Galle road- the most powerful urban element. As a result, urban centre is being compartmentalized and therefore is at the brink of becoming a non-city. Its bounded nature is disappearing with the two celebrated points becoming insignificant. Their sense of belonging has been threatened by the mediocre architectural forms, which do not respond to the place. All cities seem to be acquiring layers that are shaped by extrinsic values such as quick financial gains, tourism, etc, and these layers eventually turn the city into typical life-less space. The city is losing its identity, failing to sustain life and becoming a haunted place, especially after day-to-day activities are concluded. Overpowering financially-driven activities and motor traffic have swallowed up the public realm and as such the container quality of the city. The traffic has become a more addressed topic than the society or quality of life in urban development. Building regulations or any other legal documents that deal with urban development do not refer to social responses or to any type of impact assessments unless there is a bio-centric environmental issue. Ecological Footprint, as an assessment for built environment, has potential to test urban

development. It will emphasise an alternative way for development regulations such as height restrictions, plot coverage, floor area ratio. Today, these regulations and guides are mostly political, financial or security oriented rather than socio-cultural. Ecological Footprint as a way of analysis would first enhance the gestalt of the city form and then prescribe the development guides for individual plots and buildings.

The strength of ecological footprint of the existing built stock was assessed in the context of evolving society. We also attempted at identifying functions and users in these buildings to revive the city centre. At the same time it has been necessary to ensure that the city form will not lose its bounded nature and the current urban identity. It is essential to identify the urban districts within the city and designate them appropriately as commercial, residential, mix, etc that together compose what Panadura is. Also, the post-industrial city is often in demand for light industries and they can be integrated within the mix zone. The strength of ecological footprint is reinforcing the designated zones so that the city will not be compartmentalized. The residential zone will demand certain amount of commercial functions but more importantly residential function should make a return to the commercial zone. The dual function built form is the key to facilitate the continuity of city image and to accommodate the returning society. Our assessment shows the possibility of turning the upper floor to a successful living space as over 60% of those who were interviewed considered the city centre as habitable. The ground floor of the building, which is a more open hall, could accommodate new types of commercial activities as well as the said light industries. In addition, it is also found that there is demand for financial activities such as banks, insurance, etc as well as for cultural activities such as galleries, studios, theatres, etc to be accommodated within the city centre. The two story buildings thus can be saved for their *soft environment* factor that attracts people, facilitates society forming, and as such strengthening the liveability of Panadura.

Typological analysis of the built fabric in the city centre assists us understanding the means of inserting the said activities and in-filling the urban grain with new built forms that would be compatible with the lead types. Educational and religious institutions located in the city centre bring many people. It is necessary to manage the solid-void ratio in the educational and commuter sectors in order to facilitate the smooth functioning of the city. The link between bus station and railway station is the most used during the day. There are many under-used built forms that could accommodate formal as well as casual public activities around this link. The most crucial problem in the city would be facilitating parking in the case of inserting new activities. It is possible to manage the type and scale of activities in order to control the need of vehicles and then to use the vacant plots in which the old buildings have been removed, and the land available behind the buildings to satisfy this controlled demand. It is also found that the new facilities would be mostly used by the local residents who may not bring vehicles if the public transport is provided. It is needless to emphasize the importance of renewing the railway and its related activities as Panadura has become one of the most popular spill-over of Colombo. Thus establishing links between the local buses and the train station would be essential. The development of a railway square thus would be important to sustain an informed ecologically-sustainable society.

Most importantly, the city plan, land use pattern, and built forms of the city inform the possibility of bringing in the revivals. Using the concept of new urbanism as a guide, we may be able to add new built forms to all the quarters of the city. The current lead building type and the typologies of elements could be exploited to enhance the current image of the city and as such links between citizen and the city. The accommodating nature of the existing buildings through their veranda, balcony and the inviting character could be used extensively in designing new urban quarters and their built elements. Urban briefs, including such information to give directions to the prospective developers and educating them on sustainability, will facilitate the making of an ecologically-sustainable urban society.

Today, Pandaura is not a flourishing life world but its extensive water bodies, mashes, and paddy fields along with the inhabited lands could support the rebuilding of a life world. The life cycle of city's economics changing in an unprecedented speed but can be comprehended by the societies and be facilitated in city's morphology. The growth pattern of the city could be made more place-



oriented: for example extrinsic values such as tourism that now take precedence could instigate the city life and the job market.<sup>45</sup> The relationship between city space and its users could also be strengthened as more place-oriented activities are inserted into urban spaces that are today under-used or unused. As such the community spirit could be resurrected, strengthening the container quality of the city space.

### **CONCLUDING REMARKS**

We find that Ecological Footprint, as a concept, could be used at policy making level to determine the scale and type of development, to empower communities and to accommodate their values into the centre of decision making, to establish grass root movements or supporting their existence in order to build up a closer rapport between the community and decision making. Furthermore, at planning level the concept controls the sprawl by declaring Environmental zones, urban precincts, etc, and integrating them in Master Plan/ Structure Plans, by screening new development, by promoting new economic activities, by promoting mix development yet without losing the perceived identity of the precinct rather than using the conventional zoning, and by turning cities into cultural diversities, and then at spatial development level to understand the particular Spatial Quality of the built environment, to design a spatial structure criteria, to develop concepts similar to the Urban Village, to promote the city spaces as a mixed used and socio-culturally diversified liveable containers, to share non-renewable resources such as water, energy, and above all the social responsibilities, Recommending spatial design tools such as veranda, courtyards, etc, to make the dwellings liveable and less expose to the hazardous environmental conditions.

Concept of Sustainable Building has been realised in many ancient civilisations. Sri Lankans, being Buddhists and Hindus respected the nature as the source of inspiration and their designs were like considered as meaningful extensions to nature. Some argue that they were an agro-based society and therefore were forced to respect the natural elements such as water, trees, etc. Their designs clearly show that their response to the location where the villages were built was more than this forced respect. Their responding to the nature was more to do with natural production of energy and respecting the energy cycle in order to lead a healthy and happy living condition. The expansion of the village was not preferred at the expense of the sustaining of the village society. The emerging of several modest villages closer to each other as spill-over and then forming of a town as the central location for trade and barter would be a notable solution to urban sprawl. The existence of such villages around the town centre is today reinterpreted as the establishment of cluster towns as a solution for the sprawl.

Traditional way of site selection for human settlements is an important next lesson for us to plan ecologically-fit living spaces. The villagers' dependence on the strength of the location brought in the limits of expansion, thus turning the village into a sustainable one. However, transformation of man's habitat from village to city and the resulted demands of the urban society cannot be met by merely following the said traditions. Since the development of technology and diversified economy were not desired by the rural society, the limitations of the village could be overcome. Their dependence on water and land also was helpful in controlling the growth. Yet, the new opportunities sought by the urban society caused the loss of control in the human habitat and its links with the environment. Our particular investigation of a living city, one can argue, cannot be inspired by the traditional village. However, such inspirations could bring parallels to the living city if we consider the city as the environment- not natural but built, thus considering the new changes as designing new buildings in nature. Site selection, controlled development in particular sites, they all can be readopted in the case of adding new functions in the used built forms.

Through development of urban design guides/ briefs in which the four basic principles: Solution grown from place: Making nature visible: Design with nature: Ecological accounting informs design, could be integrated. Moreover, they will result in the making of an informed society. We intended testing a form of retrofitting more than new developments so that these cities and towns would

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<sup>45</sup>. Jensen-Verbeke (1995) notes how tourism activated socio-economics in Bruges.

become better living environments. They would grow without losing their own nature and culture, or without losing their bounded space. As a whole, the city will continually reflect the nature where the city is built, the man who came to that nature, society evolved by him to survive, and institutions, networks and values developed by that society to be a true Eco-community.<sup>46</sup>

It is noted that the Eco city would mark a true continuity of a culture by responding to the present as well as future demands. It will be a highly futuristic human setting that learns lessons of the past and project those lessons towards the future.

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<sup>46</sup>. Doxiadis has noted five elements that make the city what it is: Nature, Man, Society, Networks and Institutions. We acknowledge his thinking in developing our urban design guides.