

Implication of Artery Developments on Socio-Physical identity Transformation in Colonial Towns in Sri Lanka; The Case of Mawanella

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Abstract

In Sri Lanka, with the colonial intrusion, emergence of new settlements and decay of older settlements were occurred. These new towns emerged as a reflection of colonial found mostly on major traffic arteries. The development of infrastructural facilities is reinforced and encouraged the basic pattern of township transformation in Sri Lanka. With urban expansions, the main arteries were not sufficient to accommodate the growing traffic needs. Hence, introduction of bypass road or demolished of old main street for the road widening were occurred in the post-independent era.

While achieving the balance between the need for growth and change, it is important to identify what components of such towns are to be retained and left out. Hence, the main purpose of this study is to identify the core characteristics that are central to the identity and character of the arterially developed colonial township as identified by both the residents and visitors of this town. The study assumes that, the identity of the town is constituted by the socio physical character generated from the urban form and the ambience created by the activities of the town. The study is conducted by several qualitative methods to discuss the matter under the theoretical framework. For the primary data collection, questionnaires are designed and interviews are conducted. The secondary data include literature on the concept and issues related to the study. Collected data discuss through place centered behavior maps, cognitive maps, and pictorial illustrations such as sketches and photographs.

The principal outcome of this study is to identify transformation of township by presenting the interdependences between artery development and townscape.

Key words: Colonial township, Socio-physical identity, Artery developments, Transformation

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1.0. Colonial townships and socio-physical identity

The term “colonial township” refers to a comparatively small town in suburban situations and such a place in Britain might meet the criteria as a village or a hamlet. These townships were mainly emerged in the nineteenth century having close relationships with human sense and traditional living characteristics.

The physical built forms of the townships are emerged as a byproduct of the structure and the functionality of traffic arteries. Majority of Sri Lankan streets are alien inherits from the Portuguese, the Dutch and the English. With the change and the growth of human needs, the emergence of township affords different social level and organizational patterns. The qualitative aspects such as form, land use and growth pattern of townships represent the living society. The social profile of the township varies with the time because of urban migration and infrastructural developments. The expansion of the economy occurs as a reflection of transformation from self-sufficient and self-contained economy to regional self-sufficient economy and regional growth centers.

In this context colonial townships can be identified as typical settlement centers emerged prior to the trading activities. With the change of the colonial power and their relationship with the local community affected the form of the township. The suburban colonial town centers were developed as way-side-stop-over along main traffic arteries such as Colombo – Kandy Road, Colombo- Galle Road etc. (See Figures: 01, 02)



Figure 01: Trade centre - Native Shops near Colombo 1929

Source: Lankapura. (2007-2011). *Street Scene, Native Shops near Colombo 1929 #IMG610*. Retrieved from <http://lankapura.com/wp-content/uploads/MARSEILLE-no.4-1929-by-Plate.jpg>



Figure 02: Native life in Kollupitiya Bazaar, Colombo

Source: Lankapura. (2007-2011). *Native life in Kollupitiya Bazaar, Colombo #IMG405*. Retrieved from <http://lankapura.com/wp-content/uploads/2009/04/native-life-in-colombo.jpg>

Many townships in hill country of Sri Lanka were originated during the British colonial occupation in 19th century as service centers along main arteries that connected the main urban centers of the region. Main concentration of commercial and institutional activities are located, and the village where the major residential neighborhoods are located. These service centers are trading posts for spices, coconut, rubber, tea, and other crops; or seaports are located along the main infrastructural arteries. The economic and social life of these towns is in larger part still centered on these activities.

Identity of township can be defined as consequence of environmental responsiveness of human beings. The identity affords distinctive uniqueness to townships to being exceptional, individual organizations. It blooms with the collaboration of different factors to one single entity. The sense of identity originates with physical, social, cultural, economic and environmental factors in townships. Heidegger, M (1969) comprises that, "everywhere, wherever and however we are related to beings of every kind, identity makes its claim upon us." (Heidegger, M. 1969:26)

Lynch. K (1960) defines the identity of place affords individually or distinction from others by acting as one entity. Identity of place or a township can be determined through understanding its' physical, social, economic and environmental aspects. Every physical invention in townscape comes under the socio manifestation.

Rapport (1977) points out that, "the relationship in the physical environment is spatial. Basically objects and people are related through representation in and by space". Link between social and physical aspects are complicated. Every intervention in built environment can be identified as a reflection of human behavior pattern, life styles, values, norms, attributes, attitudes, sense and other aspects that link people and environment.

By means of Rapport (1977) reveals in "Human Aspects of Urban form" there is necessitated consider about social values, attributes, human aspects, quality of physical erection to identify essence of physical entity.

Understanding identity in township can be defined as socio physical manifestation of mechanisms that link physical setting and inhabitants. The maximizing degree of choice available to inhabitant in built environment defines as responsive environment. Bentley (1975) describes seven factors of environmental responsiveness as permeability, variety, legibility, robustness, visual appropriateness, richness, and personalization engaged with the mechanisms that link man and physical attribute.

2.0. Transformation of colonial townships; socio-physical manifestation

The transformation is accumulated to physical, social, economic and environmental changes in Sri Lankan context. Colonial intrusion resulted to transform the settlements as trading, manufacturing, administrative, defensive, religious and cultural centers. Colombo, Galle, Kandy and Jaffna began to emerge as foci of trade and administration centers during this period. Transformations of colonial townships primarily occur due to infrastructural developments, industrialization and township expansion. In recent decades, urban transformation drastically occurs in ad hoc and spontaneous manner.

Urban expansion has taken place in Sri Lanka since the introduction of economic crops cultivation industry with the British rule. As a result of emergence industrial and commercial enterprise in nineteenth century and developments in twentieth-century, urban population

started to grow. During the British period, traditional trade activities were shifted by commercial and industrial activities. Most of the lands were used for economic crops cultivation such as tea, rubber, coconut, coco, coffee and spicy crops. Simultaneously factories, offices, quarters were emerged by introducing different formation.

Impact of the bypasses can be identified under the socio, economic and environmental point of view. The trading activities, which targeted traffic passing by got, shifted from old to new road. As a reflection of rapid commercial development, many residents at the old road were converted to shops and institutions.

In many situations old Main Street demolish for the widening of it, are gradually emerging at the set-back positions redefining the new 'Broadway'. With this change, new buildings are erected by introducing new character along the main street. At the same time emergence of secondary artery development, stimulate the node activities. Dramatically commercial development is enhanced through new building construction. However, artery developments are an important aspect that directly influence on the growth of township in Sri Lankan context. In addition, regional and global connectivity are afforded. Improvements in transport facilities are strong the communication among urban and rural areas. It has facilitated the movement of rural production to the urban areas and industrial production of urban to the rural areas and this may in turn have increased the transfer of capital in the form of new settlement by migrant laborers. Hence, there are numerous factors that can be identified as the socio- physical transformation of the township due to the impact of artery developments from time to time. (See Table: 01)

Table 01: The factors affected on socio-physical transformation due to the artery development

Transformation of socio –physical aspects due to the artery developments			
Physical factors	Social factors	Economic factors	Environmental factors
Building density Organization of built structure Open spaces Transportation Services	Population Routine events Lifestyle Behavior patter	Commercial value Land value Diversification of marketing items	Topography Regional climate

Source: Author

The above factors affect the transformation of township's identity in directas well as indirect way. According to the literature survey, the identity of colonial township is based on three main aspects; **form, activity and meaning**. There are nine factors generated with collaboration of factors influenced on the township's identity and the factors change due to the artery developments. Hence, these nine factors are established considering the above categorization to manipulate transformation of the socio-physical identity in Colonial Township. (See Table: 02)

Table 02: The factors affected on transformation of socio-physical identity due to the artery development

Factors	Impact of artery development on identity	Referred persons
Urban solid and void ratio	Urban solid and void ratio	Roger Trancik [1986]
Dominate of natural setting	Dominate of natural setting	Gordon Cullen [1961] Gerald Burke [1976]
Variety of artifacts	Variety of artifacts	Ian Bentley [1985] Jan Gehl [2010]
Superiority of connectivity and accessibility	Superiority of connectivity and accessibility	Ian Bentley [1985]
Sensitivity of inhabitants	Sensitivity of inhabitants	Ian Bentley [1985] Gordon Cullen [1961]
Flexibility and adaptive character of space	Flexibility and adaptive character of space	Ian Bentley [1985] Amos Rapoport [2005] Jan Gehl [2010]
Responsiveness of inhabitants	Responsiveness of inhabitants	Ian Bentley [1985] Amos Rapoport [2005] Jan Gehl [2010]
Ability to grasp	Ability to grasp	Ian Bentley [1985] Kevin Lynch [1975]
Quality in variety of sense-experiences and delight	Quality in variety of sense-experiences and delight	Ian Bentley [1985] Gordon Cullen [1961]
Form	√	√
Activity		√
Meaning		√

√- Discuss area

Source: Author

(i) Dominate of Natural Setting

This is the ability of supersede the object in particular setting which belongs to natural environment that can be drastically changed with prioritizing of traffic. Character of the place is determined through the natural elements such as rock, valley, plain, water body, forest, etc. Topography is changed due to the deforestation, filling of lowlands, bulldozing highlands, removing natural elements, for the purpose of artery developments such as road winding and introduction of secondary roads or by pass road.

(ii) Urban Solid and Void Ratio

Introduction of artery developments stimulates origination of new artifacts in urban environment. As a result, the spatial form of township is changed by destabilizing urban solid and void ratio. The artery developments are caused by reducing and limiting urban void space and spreading or increasing urban solid.

(iii) Variety of Artifacts

Because of traffic prioritizing in townscape, the diversifications of artifacts are aroused along the artery. Variety of artifacts drives as byproduct of human attitudes, attributes, behavior patterns, and life styles. According to the transformation of artifacts, discusses under its components, height variation, set-back.

(a) Variety of Building Components

Variety provides contrast to harmony and unity. Variety of building components consist of the differences in objects that add interest to a visual image. It can be achieved by using opposites or strong contrasts. Changing the size, point of view, and angle of a single object can add variety and interest to a visual image. Each and every building component reveals the human needs and aspirations that change with time. The quality and quantity of building materials obtainable in the locality, the skill in design and building craftsmanship available at particular time are caused.

Traffic oriented townships carry out outstanding building components to obtain attention of motor vehicles than the pedestrian. Most of significant building components or fixtures are converted their scale, proportion, appearance and direction to accommodate fast traffic movement. With the artery developments new building regulation or restriction is introduced that cause for increasing or decreasing the variety of building components. Likewise demolishing of existing building façades for the purpose of road winding stimulates arising of different mode for reconstruction process.

(b) Height Variation

Transformation of socio economic aspect due to the artery development directly influences the building height. Variation of building height drastically occurs due to the increasing of commercial value of the land and reducing of available land for erection.

Collective built forms' heights create the skyline in context by originating vertical barrier or interface to the open space. The height of the building is aspect that is more important in the urban context.

(c) Set-Back:

Set-backs of the built fabrics manipulate the space for different activities in urban context. In addition, that provides the distance to experience the building façade more detail wise. Implication of artery development on the above factor can be identified in both favorable and unfavorable ways. Existing building fronts are reduced due to the demolishing of existing building façade for road widening process and new construction allows in remaining wide building front way according to the new regulations.

(iv) Superiority of Connectivity and Accessibility

This qualitative factor enhances the choice of fenestration or accessibility in township. This means the degree of freedom for non-fix object to circulate, to penetrate to individual destinations, and to stop on arrival. The context becomes more porous and less cohesive with incensement of this factor. The accessibility across the interface between public and private has different implication with the quality of that. This factor can be studied under two ways: physical linkage and visual linkage.

(a) Physical Linkage- Street Network

Physical linkage between public and private property drives by street network. With the artery development, fast traffic movement stimulates and causes for diminishing the superiority of connectivity and accessibility in township. Simultaneously introduction of alternative access such

as by pass road or secondary roads cause for reduce traffic congestion that upturn the superiority of connectivity and accessibility.

(b) Visual Linkage

Visual linkage between public and private property is enhanced by quality of interface. In addition, it enriches the public domain. Lack of disturbance among interfaces generates better communication. The quality of interface varies in relate to the function of the building. Developments of road network enrich the visual penetration of commercial buildings and deteriorate in residential.

(v) Sensitivity of Inhabitants

This factor is based on the prioritizing aspect in townscape. Along with the development of road network, traffic dominated over townships causes for the changeability of human responsiveness. This aspect can be studied under three main factors; sense of motion, sense of touch and sense of sight.

(a) Sense of Motion

Motion or movement in a visual image occurs when objects seem to be moving. Movement in a visual image comes from the kinds of shapes, forms, lines, and curves that are used. Sense of motion manifest choice of kinetic experience only gained through movement. This sense personalizes regard to the ability of experience and grasps it in mind when moving through a place. Therefore, this is mostly relevant to the large spaces.

(b) Sense of Touch:

Sense of touch can identify as both voluntary and involuntary in character. Scale of the space defines this factor in different way. Surface texture can be packed into the smallest of space and variety of air movement and the temperature can be reserved for large once.

(c) Sense of Sight:

Sense of sight embeds to the visual richness of human beings. Visual contrasts in the surfaces concerned is derived the sense of sight. Bentley (1985) states two factors as basis of richness that the orientation of the surfaces concerned and the likely position form it will be viewed. Visual impact of the object depends on viewing time, viewing distance and the techniques and materials used.

(vi) Flexibility and Adaptive Character of Space

This factor provides the association of different functions at a single space at the same time. Also can be defined as multifunctional space adaptive relevant to the user category and the time factor. Flexibility and adaptive quality of place enhance the variety of activity. Due to numerous nuisances arise with artery developments most of town space absent in the sense of flexibility and fleeting. Flexibility and adaptive character of space tie with the quality, scale, proportion of space.

With artery development townscape transform to accommodate traffic in town that cause for shifting the pedestrian active spaces by vehicular parking.

(a) Built Forms: Ability of changing the built space with respect to the need of inhabitants can be discussed regarding this factor. The flexibility of space determines the richness of adaptive character. Here the public building components such as verandah, balcony, etc. are considered.

(b) Open Spaces: The flexibility and adaptive character of the open spaces such as streets', public squares' are discussed here. Open spaces in urban context facilitate both vehicular and pedestrian activities.

Vehicular activity - The major activity in the core structure of the public spaces is vehicular circulation.

Pedestrian activity – The most spaces are colonized from their edges.

(vii) Responsiveness of Inhabitants

Environmental responsiveness of inhabitants is considered under this factor. Different persons respond to the same space in different ways because of their socio-cultural differentiations. The scale of inhabitants' responses on place bases on character of the place and the person.

People respond to the new artery developments with reference to the above two ways. Rapid growth of vehicles which passes across the town influence on people to change the image of built environment as well as practical inventions to accommodate traffic. When examining the impact of traffic on street life the interaction between traffic and residents becomes a significant aspect.

(viii) Ability to Grasp

Quality of graspable means the ability of understanding or reading a structure or perceiving it in mind. This can be manifested as in two levels such as physical form and activity pattern. These two aspects may read separately. Nevertheless, the combination of both aspects drive strong image in outsiders mind.

(a) Physical form: Kevin Lynch (1960) suggests that physical features can be grouped into five key elements such as paths, nodes, landmarks, edges and districts. Artery development directly influences the image of the townscape by compromising transformation of above elements. This carry outs the diversification of graspable space.

(b) Activity Pattern: In some cases, activity pattern dominates the character of the place and it is used to grasp the place without much concerning about physical form. Along with developments of road network, the newly created commercial activities cause for diminishing traditional street activities.

(ix) Quality in Variety of Sense-Experiences and Delight

This factor embeds the quality in variety of sense-experiences which can be enjoyed by the user. According to the study, this factor is examined as a collaboration of different qualities such as balance, proportion, pattern, repetition, rhythm, harmony and unity. Most of new

built fabrics diminish from above qualities that prioritizing the flat, smooth surfaces for easy maintenance in traffic towns.

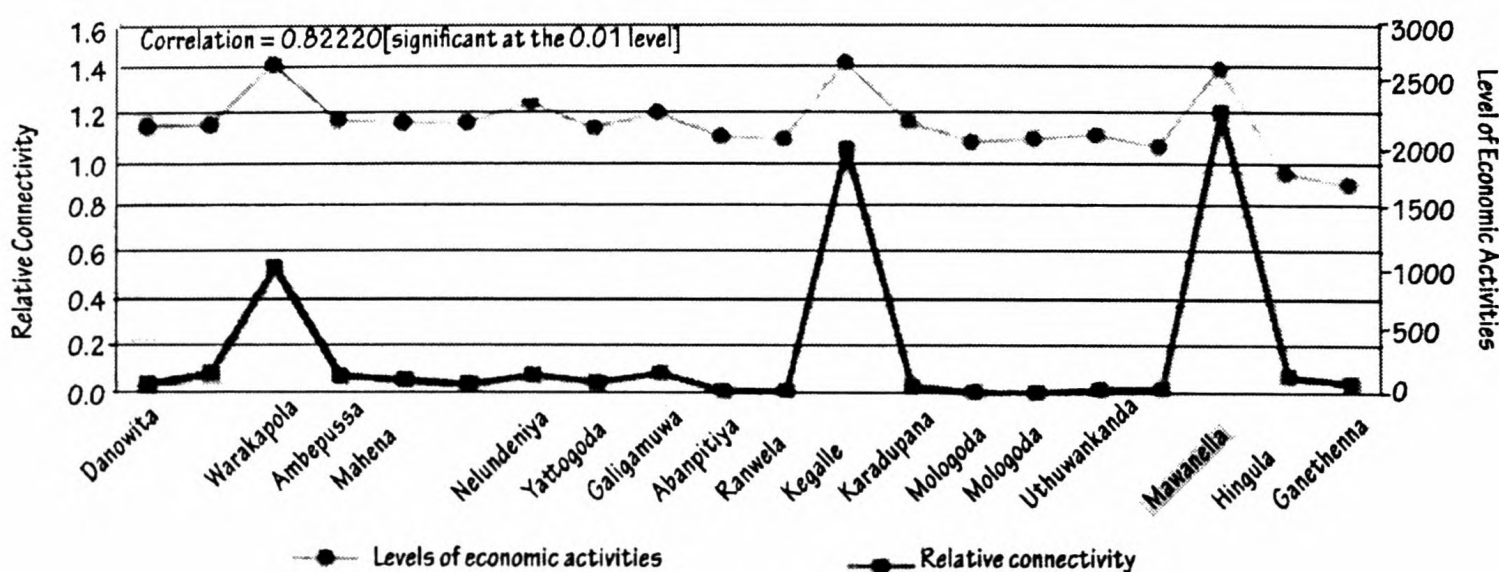
3.0. Transformation of socio – physical identity; the case of Mawanella- arterial town

Case Study Selection Criteria

Colombo – Kandy road is the most significant colonial artery development in Sri Lanka. Consequently, most of suburban townships originated along that main artery such as Galigamuwa, Kegalle, Mawanella, etc. Among them Mawanella township is selected for examining the township’s identity transformation because of its high level of urbanization due to the node activities. (See Figure: 03)

The development of township bases on the high level of mobility due to the artery developments. Thus, relative connectivity and accessibility primarily stimulate the rapid urbanizing.

Figure 03: Node relative connectivity and level of economic activities along the Kandy road



Source: Jayasinghe, A. B. (2008)

Mawanella is identified as the second scale town in the hierarchy of towns in Kegalle district. It is situated fifty kilometers away from Colombo in the east, and twenty-five kilometers away from Kandy in the west, based on the Colombo-Kandy main artery. (See Figure: 04)

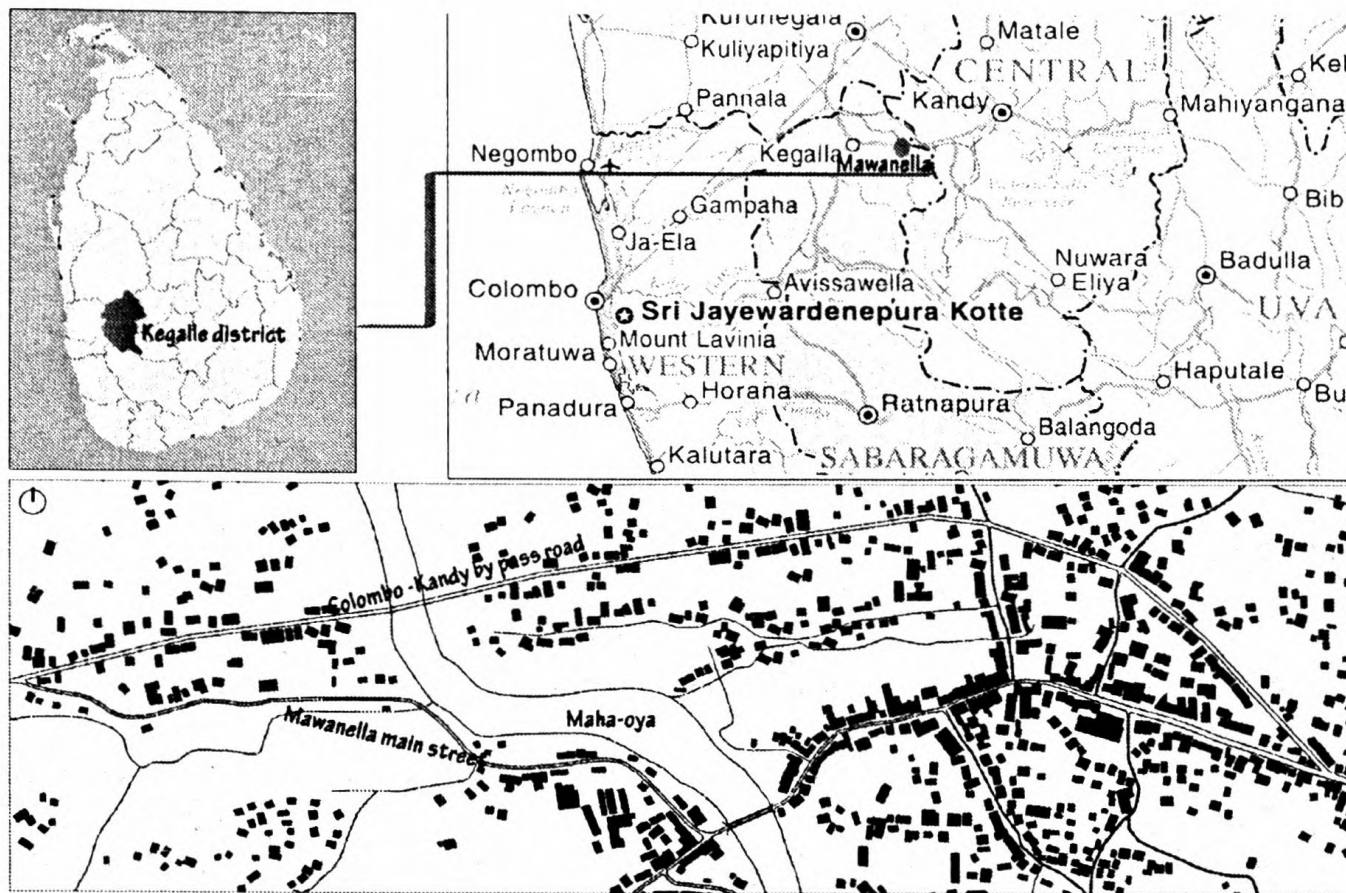


Figure 04: Mawanella location map and town layout
Source: Author's construction based on Google images

Early settlements were established in Mawanella area from the 15th century. According to the legends a thick jungle, covered the short mountain range spread from Peradeniya to Maha-oya during the early 14th century. This area prevailed as a store village during the 15th and 16th centuries. At that time, there were no more than five houses, which had tiled roofs.

With the construction of Colombo-Kandy main road in 1832, the new settlements were emerged rapidly. During that time, the minor export crops were famous for cultivation and later, it consisted of large coffee estates with the introduction of economic crops by British government. With the establishment of service providing centers and the emergence of small trading activities along the main street, Mawanella Township was formed. Several reasons affected to the rapid development of the Mawanella Township such as emerging of secondary arteries, filling the marshy and mud lands for road widening and introduction of the Colombo-Kandy by pass road as a solution for the traffic congestion.

Hence, emergence and transformation of Mawanella Township can be identified as a byproduct of the artery developments. The developments that occur without having a methodical development process cause to create a conflict situation in the physical, social, economic and environmental identification of townships. This township is identified as a rapidly developing and urbanizing region. Therefore, it is necessary to discuss further under this topic.

Data Collection Tools

The study is based on theoretical frame formulated literature survey to perceive the implication of artery development on the socio-physical identity of township. According to the framework, the several qualitative methods are carried out the fieldwork such as preliminary observation, systematic observation, behavior mapping, cognitive map, archival research and on-site documentation and interviews.

- (i) **Preliminary Observation/ "Eyeballing"**: This method enables identification of the specific characteristic and the important aspects along the main artery. Distinct characteristics in built environment are recognized by comparing with casual observations. In this stage, primary interviews are carried out with inhabitants to get an idea about the character of Main Street and to conduct initial photograph survey. The casual observation is followed by detailed systematic observations.
- (ii) **Systematic Observation**: Accurate data and information are collected by conducting pre-arranged system with reference to the information gained by casual observations. The necessary data are collected according to the theoretical framework of interviews, behaviors that occur in the selected places along main artery.
- (iii) **Behavior Mapping- Place Centered Map**: Place centered maps are used to reveal where activities are taking place and what kinds of activities are happening in selected spaces. Observations are conducted in specific period of time and are recorded on prepared maps and diagrams.
- (iv) **Cognitive Map**: Mental representation of a town can understand through mind maps that are drawn by inhabitants, before and after the artery developments. These maps can be used to recognize the graspable places or buildings along the street. This is conducted by giving blank sheets to individuals and asking them to draw maps of the given area.
- (v) **Interviews carried out from Different Groups**: Interviews are carried out with 20 people belong to different social groups to examine several factors. Data are collected through a table using necessary materials such as picture cards, maps and video clip.

The selected social groups are included as follows.

- 1 = Senior citizen - inhabitant
- 2 = Shopkeeper - inhabitant
- 3 = Street vendor - inhabitant
- 4 = Community consultant - inhabitant
- 5 = Traveller

- (vi) **Archival Research and On-Site Documentation**: Data are collected in the forms of in-field and off-field notes such as historical records, maps, formal and informal interviews with people who witnessed the changes in the past and pictorial illustrations such as photographs and sketches. The successive changes in the spatial context are expressed in maps.

Data are collected in formal and informal ways by means of theoretical base. The following table points out how collected data for each factor can be recognized in literature survey. To collect data of some factors, more than one method is used.

(See Table: 03)

Table 03: Methodology of study factor in case study

METHOD			DOCUMENTS		INTERVIEWS	MAPPING			DRAWINGS		
			Archival Measures			Structured interviews					
			Method		Method			Behavioral map		Cognitive map	Method
			Personal collection – photographs	Library	Focus group-[selected five persons] 1 = Senior citizen - inhabitant 2 = Shopkeeper - inhabitant 3 = Street vendor 4 = Community consultant - inhabitant 5 = Traveller [Materials - photographs, sketches and video clip.]	Constructing based on	Method	Method	Method		
					Place-centered activity map	Time laps photographs	Layout plan	Mind map	Layout plans Street cross sections		
FACTORS	Form	01	Urban Solid and Void							√	
		02	Dominate of Natural Setting		√		√				
		03	Variety of Artifacts	√			√				
		04	Superiority of Connectivity and Accessibility				√		√		
		05	Sensitivity of Inhabitants				√	√			
	Activity	06	Flexibility and Adaptive Character of Space		√		√	√	√		√
		07	Responsiveness of Inhabitants				√	√	√		√
	Meaning	08	Ability to Grasp				√		√		
		09	Quality in Variety of Sense-Experiences and Delight	√			√				

√- Discuss area

Source: Author

Data Analysis Method and Fieldwork Procedure

The study is conducted on the information gained from inhabitants. After the preliminary observation, the systematic observation is started with reference to the interviews carried out with inhabitants. From the information gathered by preliminary interviews three main junctions are selected along the main artery for the study. After that, materials are prepared such as picture cards, maps, video clip for the next stage of interviews. By means of information gathered through interviews, the nolle maps, cognitive maps and sketches are prepared. Analysis

of case proceeds with reference to the collected information and materials and is based on the theoretical framework constructed under the literature survey.

Formulated nine factors are examined under the three main artery developments occurred in different centuries. The analysis of case only proceeds along the main artery.

Construction of the Colombo – Kandy road can be identified as the first stage of artery development that affected the particular region. The selected study area located nearby Maha-oya, originated to accommodate bullock caters and horse carriages travel along the Colombo – Kandy road and where later commenced a vehicular movement. The study bases on the light traffic generated at the end of nineteenth century to mid of twentieth century (1890-1940) along the main street. (See Figure: 05)

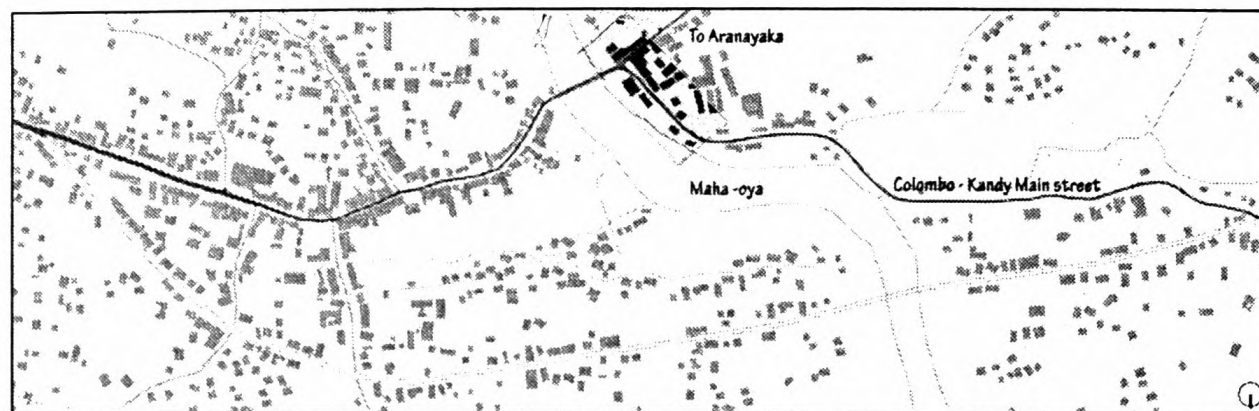


Figure 05: First stage of development along the main street (1890-1940)
Source: Author

The second stage of development can be recognized as secondary arteries' erection over the main street to access the villages after bullock carts shifted to lorries and other motor vehicles emerging moderate traffic. The study area relates with buildings originated nearby the junction and linearly stretched along the main artery (See Figure: 06). This development of township belongs to mid of the twentieth century to end of that (1944 – 1994) to accommodate moderate traffic along the main street.

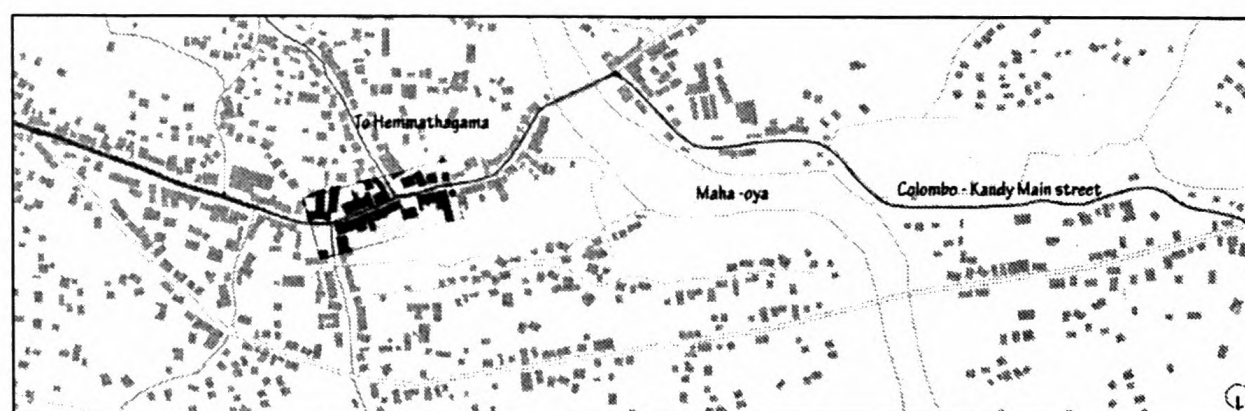


Figure 06: Second stage of development along the main street (1944 – 1994)
Source: Author

Road widening process can be identified as the third stage of development due to the heavy traffic flow along the main street. Most of mud and marshy lands were filled for widening the main street. Steadily, buildings are constructed on the filled land along the main artery (See Figure: 07). This development can be identified as linear extension of the township that occurred at the end of the twentieth century to twenty first century (1995 – 2005).

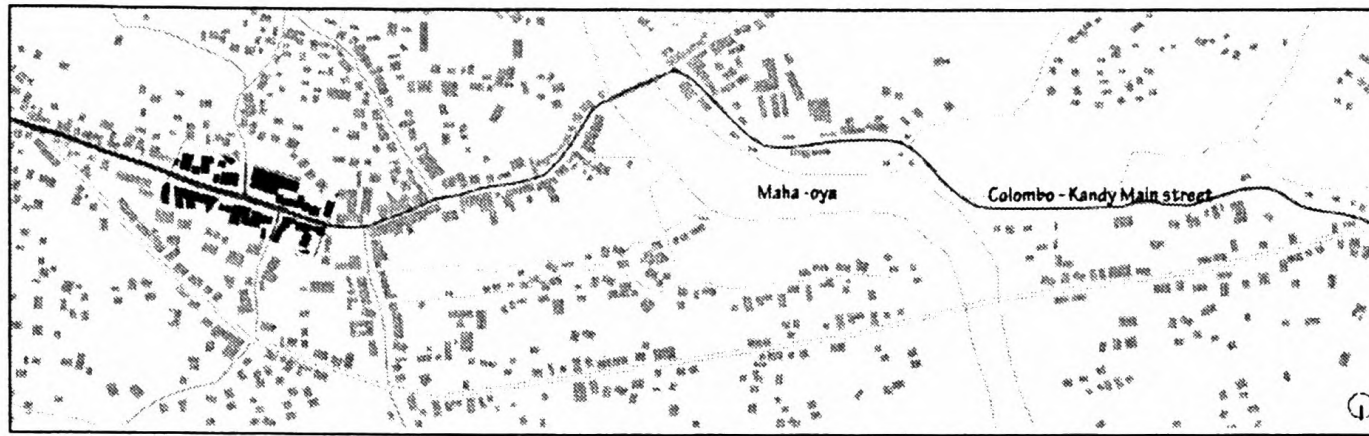


Figure 07: Third stage of development along the main street (1995 – 2005)
Source: Author

In 2005, the massive artery development occurred due to the introduction of Colombo-Kandy by passroad to reduce traffic congestion along the main street which can be identified as fourth stage of development (See Figure: 08). There are new scales of buildings originated as a reflection of this development (2006 – 2012)

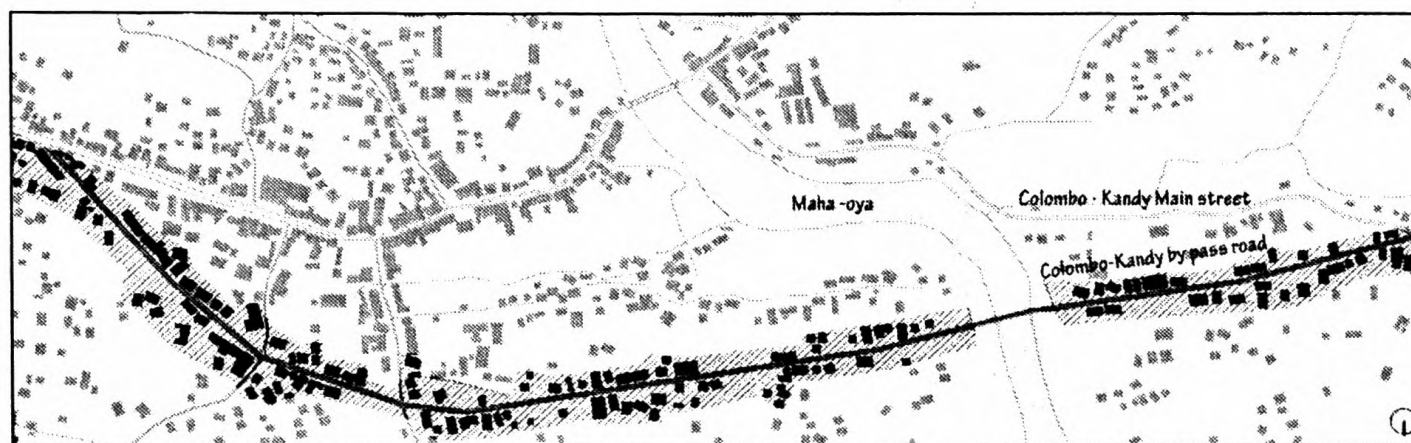


Figure 08: Forth stage of development – Introduction of bypass road (2005 – 2010)
Source: Author

This study is carried out as an analysis according to the above development stages based on nine design principles established as above. Though the original maps are not available, above maps are developed according to the information and data obtained by inhabitants. This study is carried out under the first, second and third stages of developments, which have been occurred along the main artery. Additionally, the impacts of fourth stage's development on the identity of main artery are discussed.

Findings

Mawanella Township originated as a way side stopover along Colombo-Kandy main artery in the British colonial period. Formation and transformation of township can be considered as a reflection of artery developments. High level of urbanization of node activities and rapid development transpired related to direct and indirect influences of Kandy and Kegalle Townships.

Diversification of religious and ethnic group is a significant aspect in regional demography. Drastic growth of Muslim population effects on economic organization of township who concentrated in town center. Economical pattern of township changed from economic crops to commercial goods since colonial era.

Core structure of the township entrenched in Main Street has been changed the spatial pattern due to the expansion of township and urban infill development. Well-compacted collective of built form generated urban built wall along the main street by constraint public open spaces.

Significant open spaces arise in Maha-oya, river valley and remained mud lands. Main street became major communal space stimulate mixed up activity systems.

Development emerged in different periods directly has an impact on township's identity as one entity. Transformation of the spirit of the township is in conflict with the traditional and commercial inventions. The relationship between the environment and the inhabitants of the traditional township is enriched by interaction, inter-dependence and responsiveness.

With new artery developments, township is highly exposed to the urban node activities that affect to urban migration. The rapid increase of town's population has caused for numerous nuisance conditions. Presently town centre is lacking with its meaningfulness, environmental responsiveness and essence that was generated through socio cultural and socio-economic conditions of the town inhabitants. Nevertheless, the socio physical organization is absent in humanistic structure. Though new artery developments attempt to regenerate traditional outdoor activities by road widening and continuing setback, it is reduced in flavor of parking and traffic.

(i) Dominate the Natural Setting

Topography and the regional climate are dramatically changed due to the direct and indirect impact of artery developments. Non-built natural lands are shifted by artery developments and post artery developments. Pleasing nature of the township has been diminished due to causes of unfavorable living condition. The dominating character of natural setting is declining with the emergence of ad-hoc multi-story built fabrics and their devices. (See Figures: 09, 10) Nevertheless, the remarkable essence of Maha-oya still is embedded.

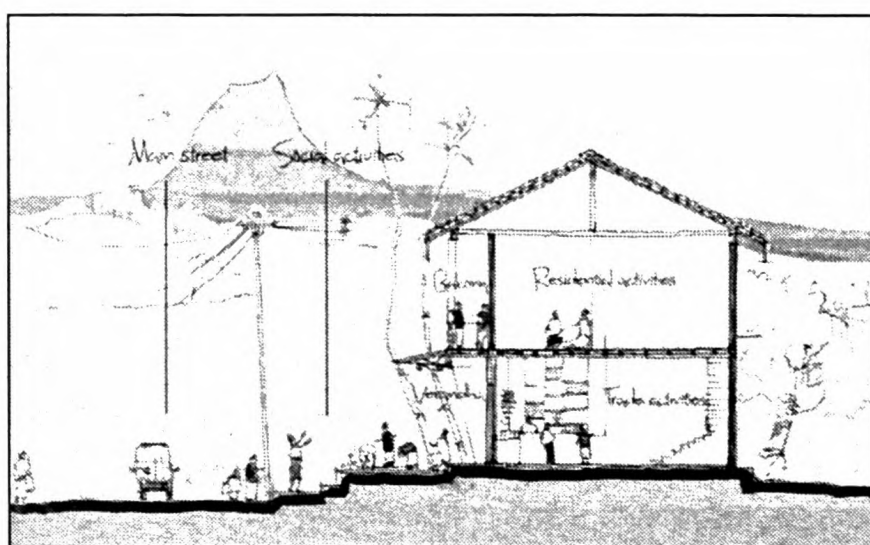


Figure 09: Townscape dominated by natural setting; section across the main street – First stage development
Source: Author

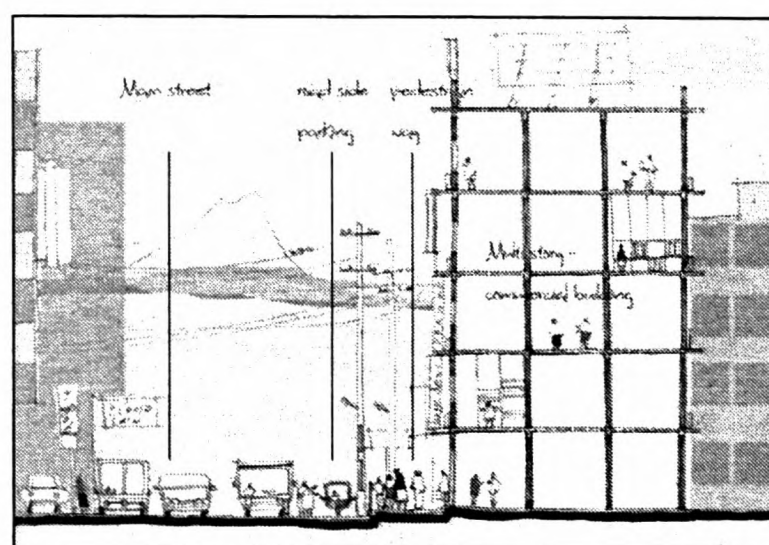


Figure 10: Townscape dominated by built fabrics; section across the main street – Third stage development
Source: Author

Conclusion: Development of arteries cause for diminishing the natural setting drastically. Therefore, arteries should be developed with respect to the existing natural setting. Simultaneously, should be controlled the post artery development to avoid vulnerable aspects of heavy traffic that highly impact on physical and visual richness of nature.

(ii) Urban Solid and Void Ratio

The artery developments considerably stimulate emergence of urban solid and decline the urban void. The main street accomplishes significant urban void framed by urban solid wall. (See Figures: 11, 12, 13)



Figure 11: Nolli map before road widening – 1995 (Second stage development)
Source: Author



Figure 12: Nolli map- After road widening, before introduce by pass road -1999 (Third stage development)
Source: Author



Figure 13: Nolli map- After introduce by pass road – 2010 (End of third stage development)
Source: Author

Conclusion: With the artery development infrastructural facilities are developed. As a result people concentrate on town centres which increase urban solid masses. That arise congested situation in suburban townships. These should be expanded and developed according to the proper planning to get rid from further decentralization.

(iii) Variety of Artifacts
(Variety of Building Components, Height Variation, Set-Back)

Artery developments stimulate the origin and transformation of artifacts in drastically. Scale, proportion, appearance and direction of building components transform to accommodate volume, composition, speed and direction of traffic. (See Figure: 14, 15, 16).

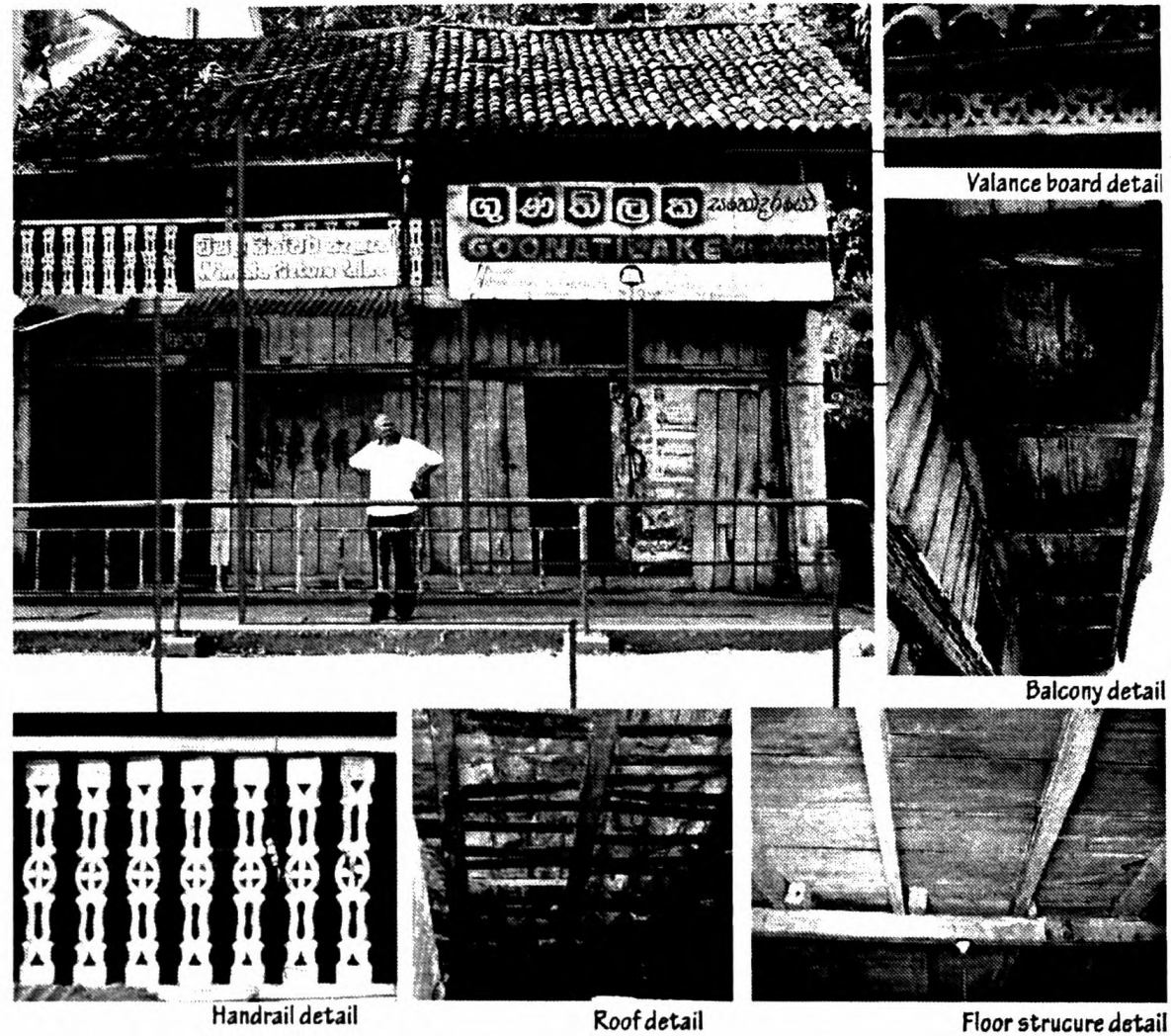


Figure 14: Scale, proportion, appearance and direction of built components generated to accommodate slow, light traffic – First stage development
Source: Author

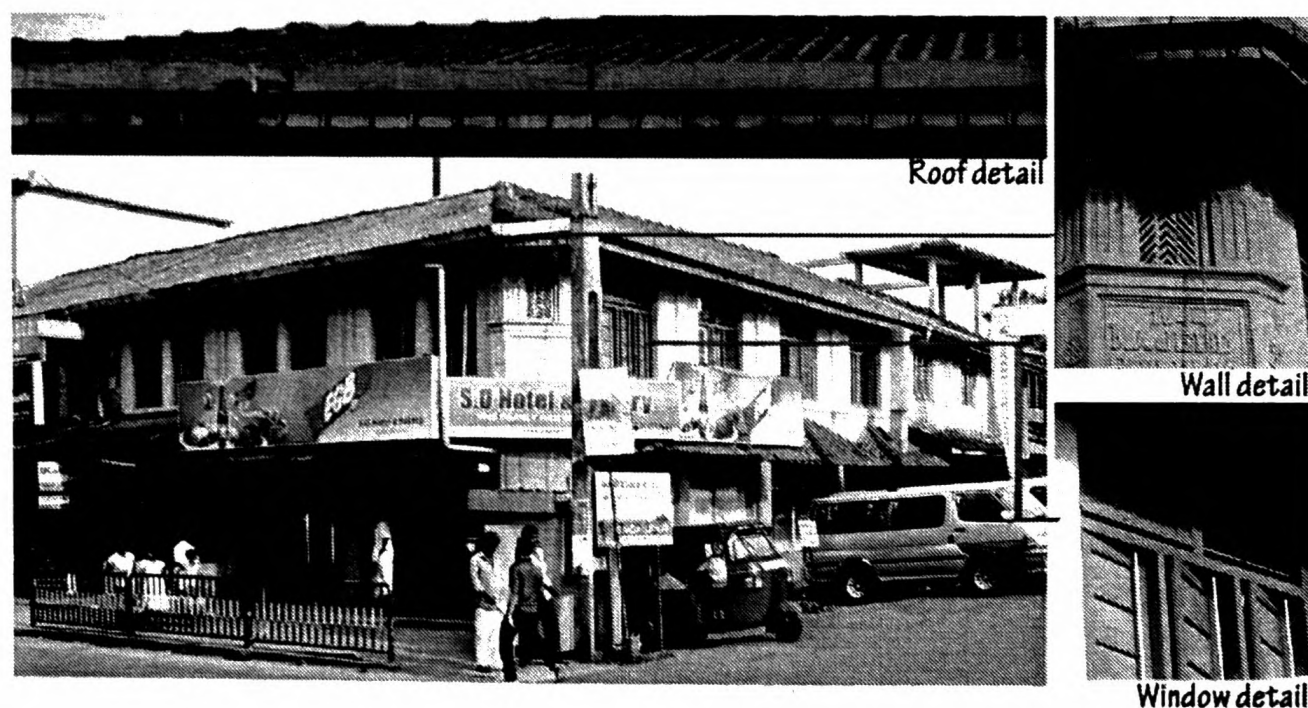


Figure 15: Scale, proportion, appearance and direction of built components generated to accommodate moderate traffic – Second stage of stage development (First erected building- 1944)
Source: By Author

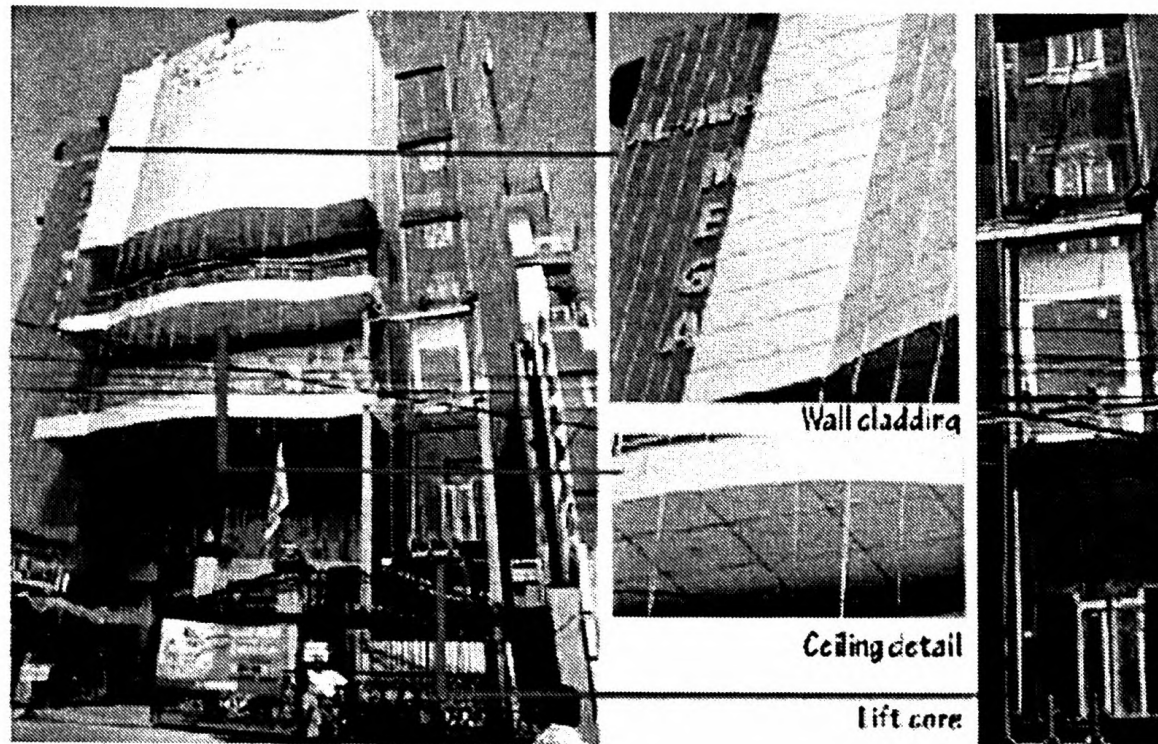


Figure 16: Variety of building components – Third stage of stage development
(Constructed at the end of stage)

Source: Author

The height of the built fabrics dominates the context significantly reflecting the commercial and land value of the town (See Figure: 17). Variety of artifacts previously emerged by responding to eye level -street activities and human scale, dramatically change to accommodate traffic along the artery. In recent decades, artifacts are aroused by concentrating on fast vehicular traffic in township. Hence, variety of artifacts fluctuates from light traffic to heavy traffic along the main artery.

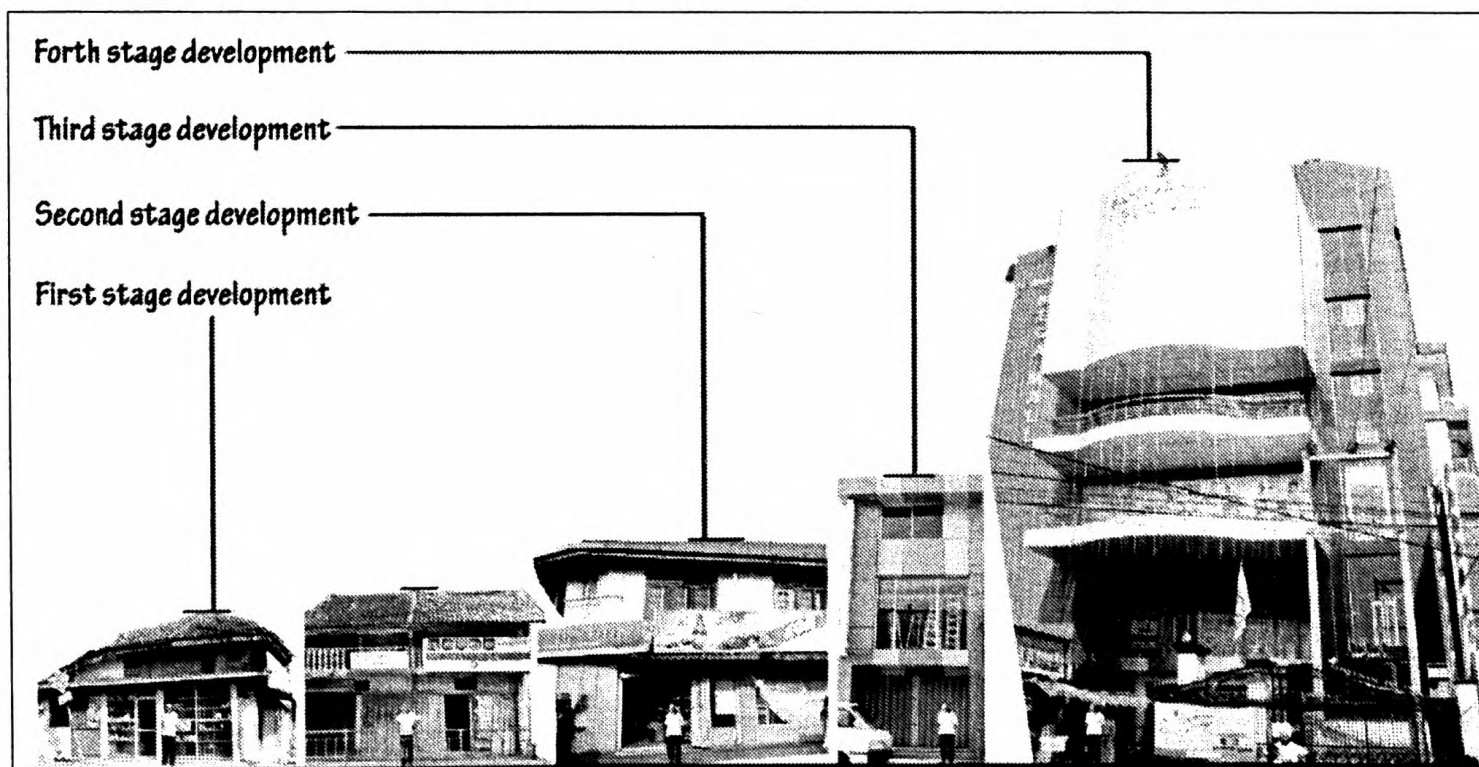


Figure 17: Building height variation

Source: Author

Conclusion: The artifacts emerge as a byproduct of human response to the traffic movement on the arteries. The Nevertheless, the development and transformation of artifacts are only concentrated on vehicular traffic. Therefore the future developments should be considered to accommodate pedestrian and vehicular traffic.

**(iv) Superiority of Connectivity and Accessibility
(Physical Linkages, Visual Linkages)**

The artery developments encourage the physical linkages. Nevertheless, the rapid commercial development that is taken place without proper planning and controlling along the arteries creates more congested situation. Due to the emissions of heavy traffic, visual linkages are diminished and also absence of using protruding elements that enrich the communication with street activities has also been caused. (See Figure: 18, 19, 20)

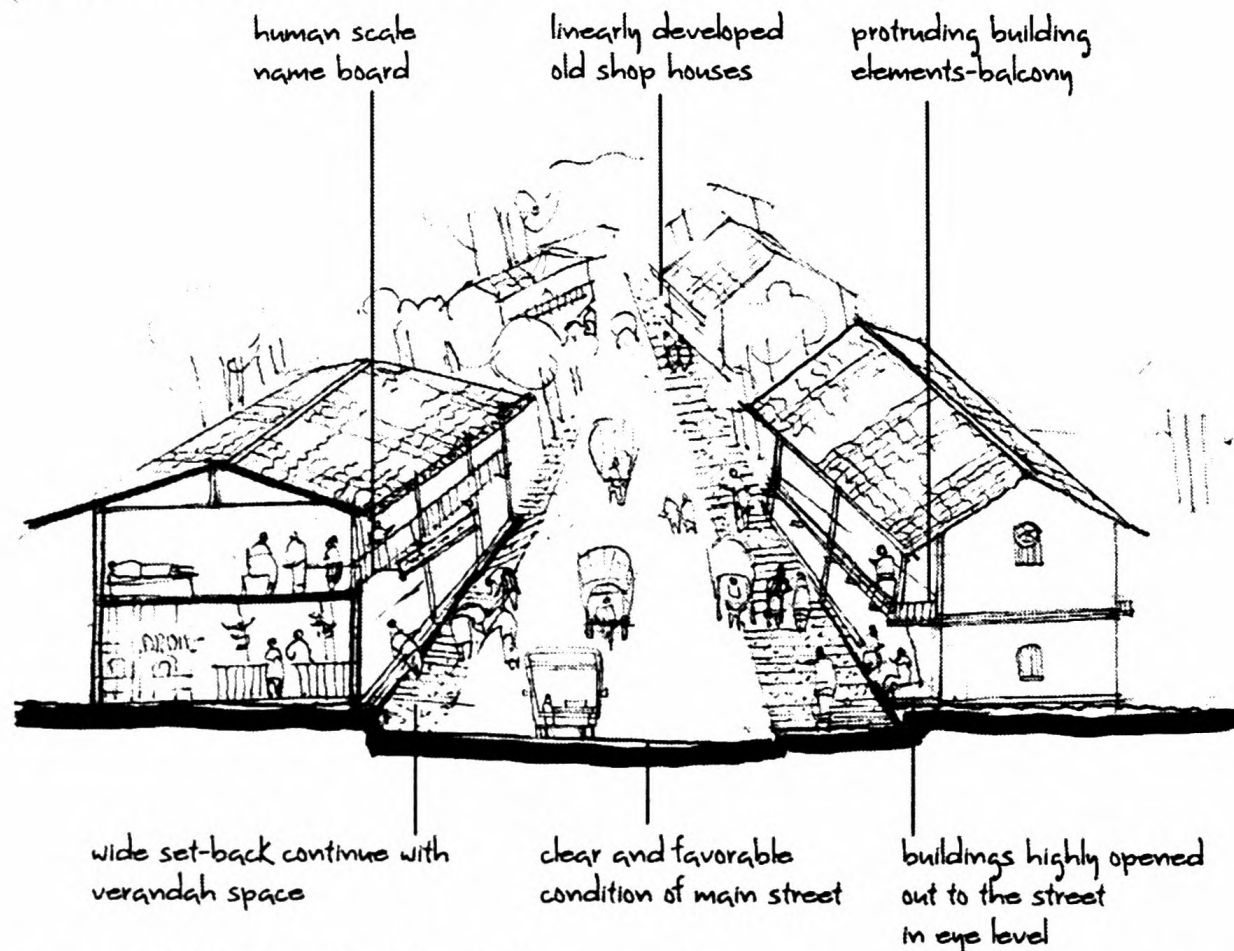


Figure 18: High level of physical and visual linkages – First stage development
Source: Author

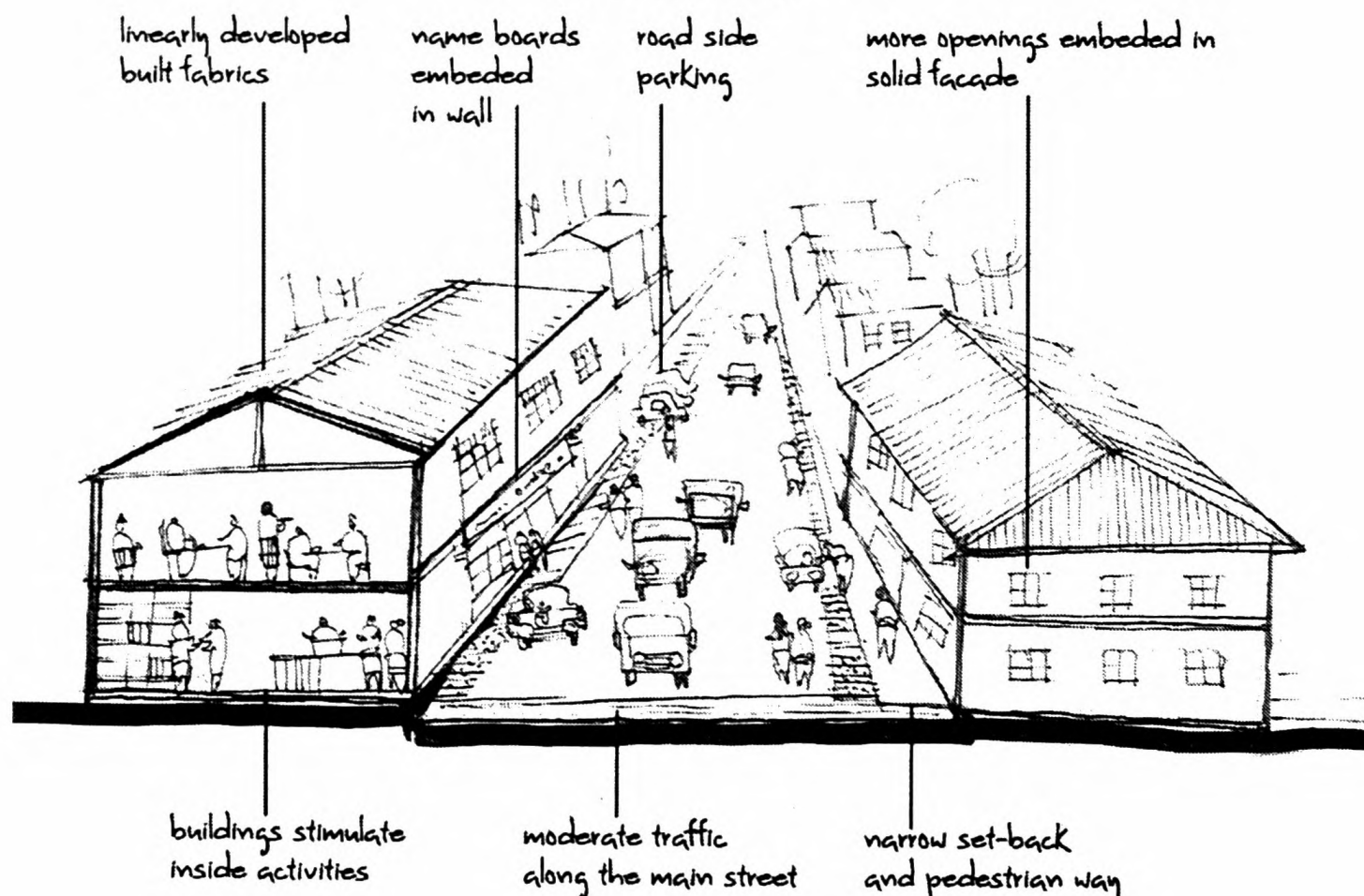


Figure 19: Moderate physical and visual linkages – Second stage development
Source: Author

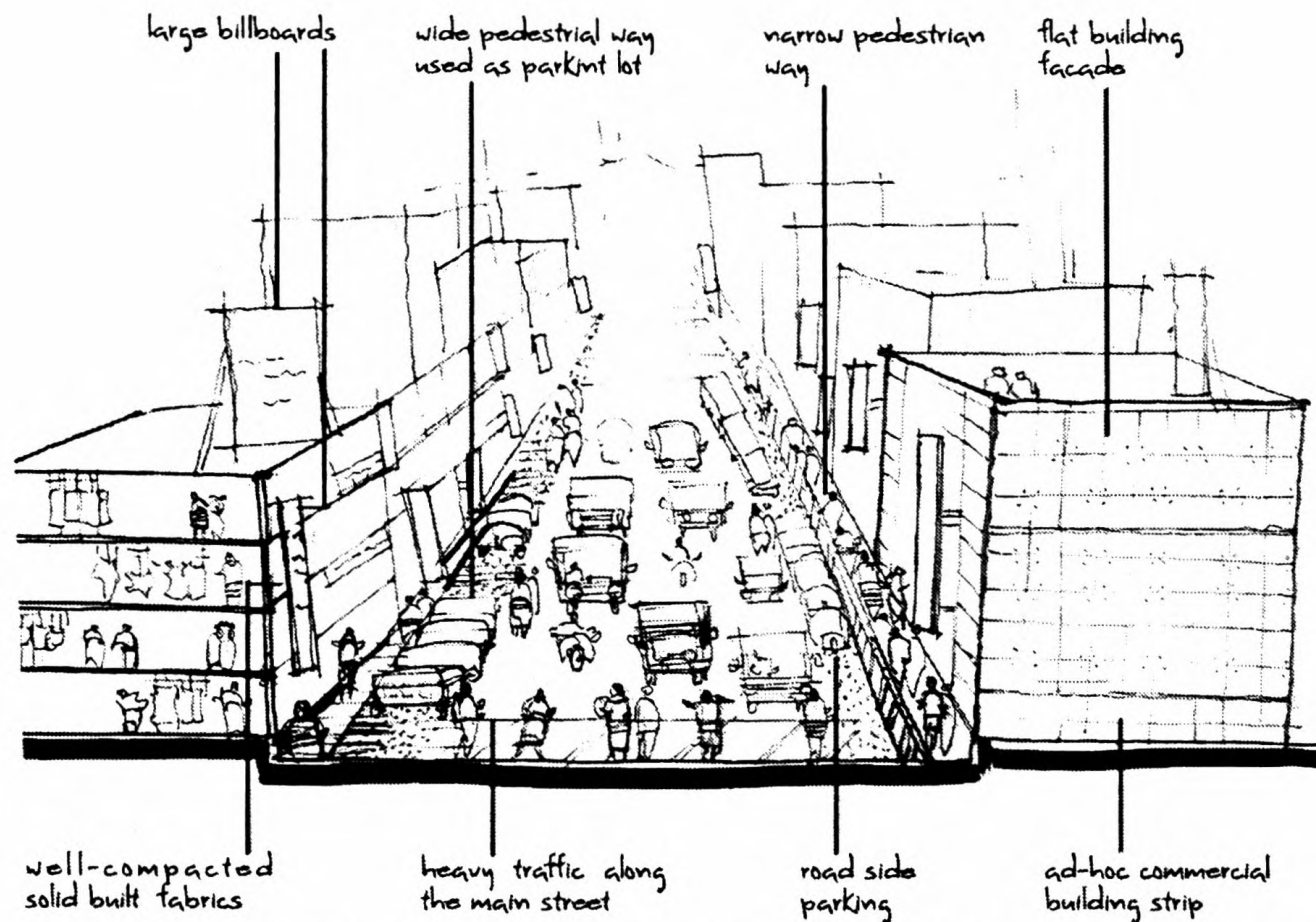


Figure 20: Low level of physical and visual linkages – Third stage development
Source: Author

Conclusion: Development of arteries is based on better connectivity and accessibility. The ad-hoc physical developments are occurred for vitiating connectivity and accessibility along the artery, due to the least attention of major purpose of artery developments. In such context, the new artery developments should be introduced as a ring road system and that will be avoiding traffic hazard within the town centre. Otherwise should be introduced new building rules or regulations that applicable to existing regional context.

**(v) Sensitivity of inhabitants
(Sense of Motion, Sense of Touch & Sense of Sight)**

Kinetic experience changes due to the artery development along the main street. Mainly three senses such as sense of touch, sense of motion and sense of sight vary by means of traffic pattern and building development. In such context the responsiveness of sensitivity of inhabitants, dramatically decline with along the spontaneous ad-hoc development. (See Figure: 21, 22).

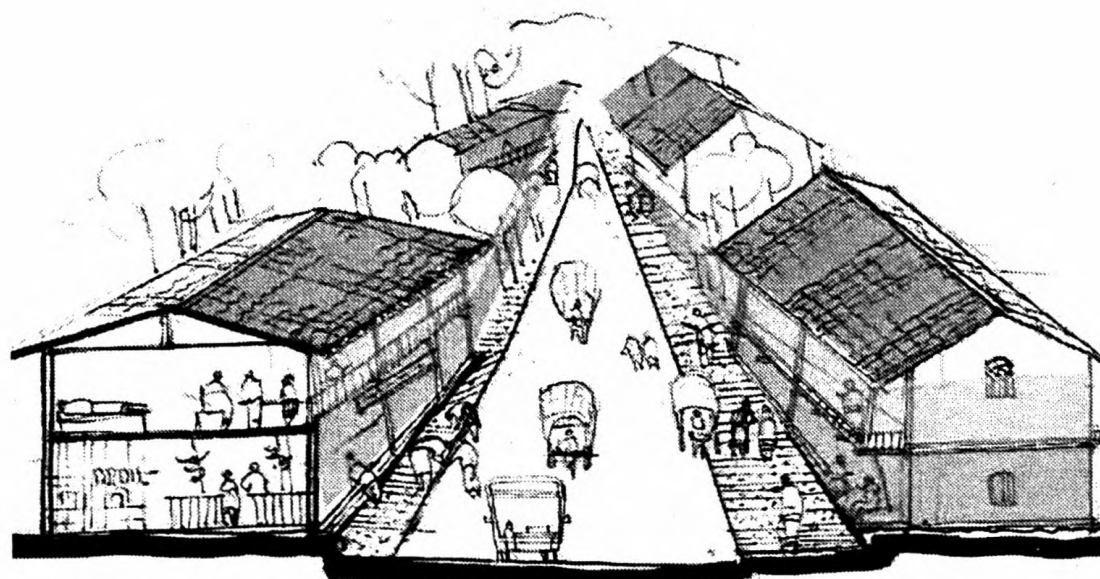


Figure 21: Clarity of kinetic experience – First stage development
Source: Author

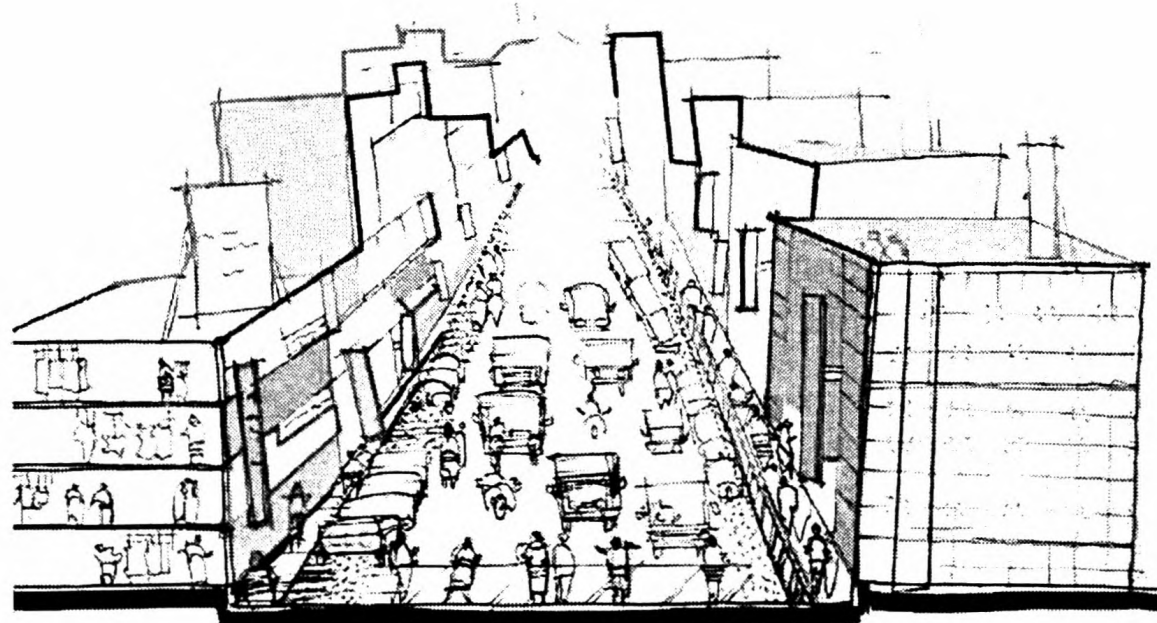


Figure 22: Dynamic kinetic experience along the main street – Third stage development
Source: Author

Conclusion: Arteries are the major elements to transport. Therefore arteries should be transformed to provide pleasant, favorable and friendly context to human. To that elements in townscape should be originated by respecting to the human senses; sense of touch, sense of motion and sense of sight.

**(vi) Flexibility and adaptive character of space
(Built form & Open spaces)**

Early development reinforced by street activities that stimulated the flexibility and adoptive character of space (See Figure: 23, 24). With the artery developments, street activities shifted into buildings and the public realm of the township is converted to accommodate vehicular traffic. As a result, numerous flexible spaces are lost due to the fixed elements or uncontrolled parking lot. (See Figure: 25, 26).



Figure 23: Pola activities happened on verandah of old shop houses, Mawanella Township – 1950
Source: Gamage, A. U. (1980). *Personal photo collection*



Figure 24: Multi-functional front verandah in old shop houses
Source: Author



Figure 25: Second stage building development
 Source: Author



Figure 26: Third stage buildings development
 Source: Author

Conclusion:

Flexibility and adaptive character in urban space enrich the townships as living container of human being. The flexible public spaces and pedestrianized street scape to be developed to avoid the diminishing of flexibility and adaptive character of space due to the vehicular traffic. For that there should be planned as a humanistic approach.

(vii) Responsiveness of inhabitants

Different artery developments influence the traffic in different way. However, people dramatically adapt or modify their environment according to their level of needs, expectation, behavior, aspiration, perception. Most of old shop houses diminished their original activities due to the heavy traffic along the main artery. Most of Sinhalese migrated to outside the town centre to get rid from traffic hazards. To reduce the negative effect of traffic residents, they have changed their living pattern and engaged in numerous adaptive responses such as prevented by using their building front protruding elements, closed windows, shifted residential activities to back side ignoring the unpleasant noise, fumes, or other nuisances. Gradually street activities shifted to inside the buildings and street became more congested space from motor vehicles. (See Figure: 27, 28).

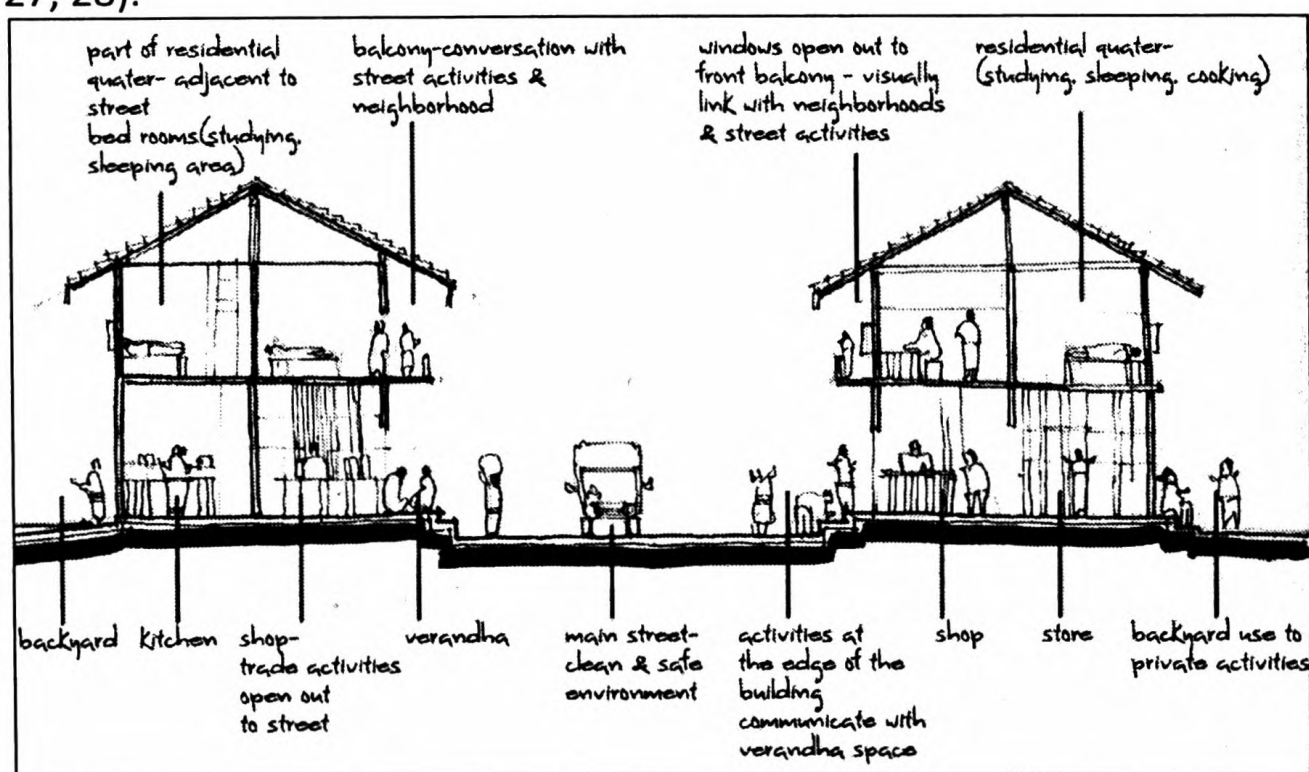


Figure 27: Street life before traffic impact- first stage development
 Source: Author

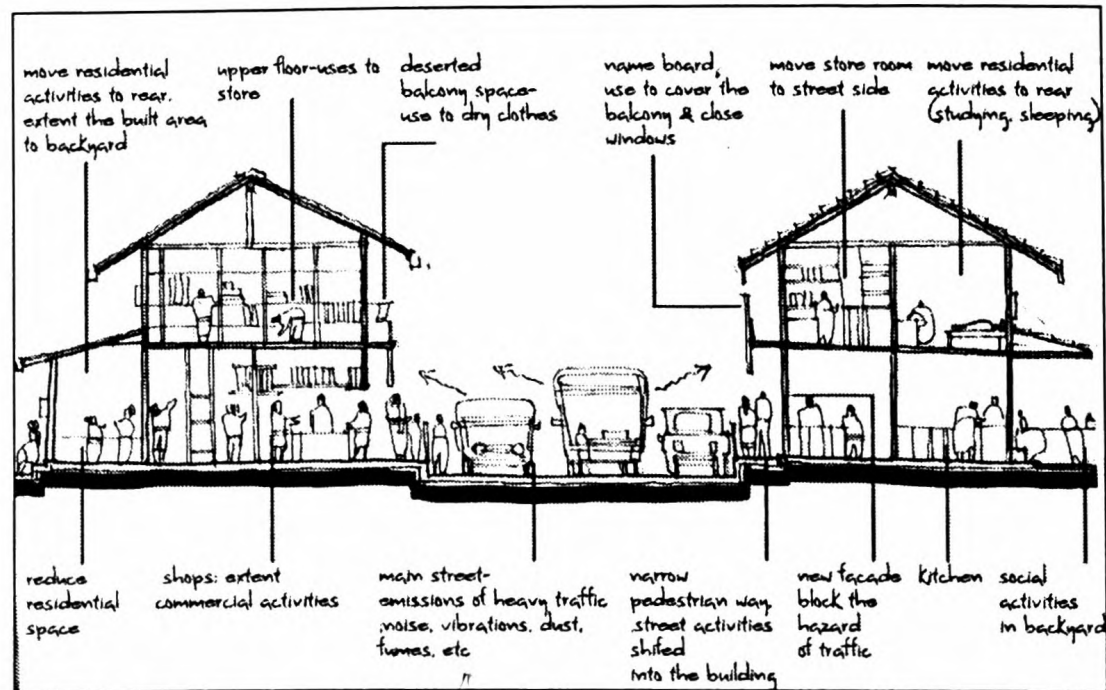


Figure 28: Street life after traffic impact- adaptive response
 Source: Author

With the filling of mud lands for road widening, the new developments are stimulated along the main street. (See Figures: 29, 30)

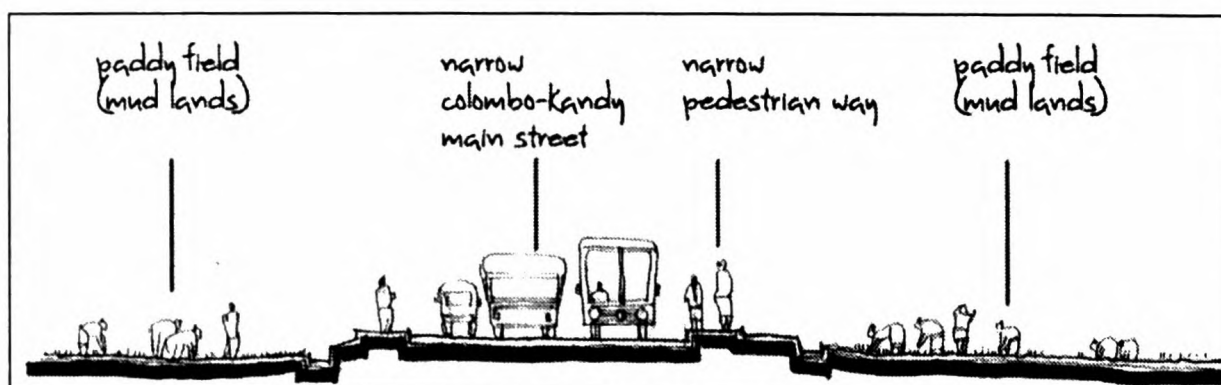


Figure 28: Section across the main street before road widening
 Source: Author

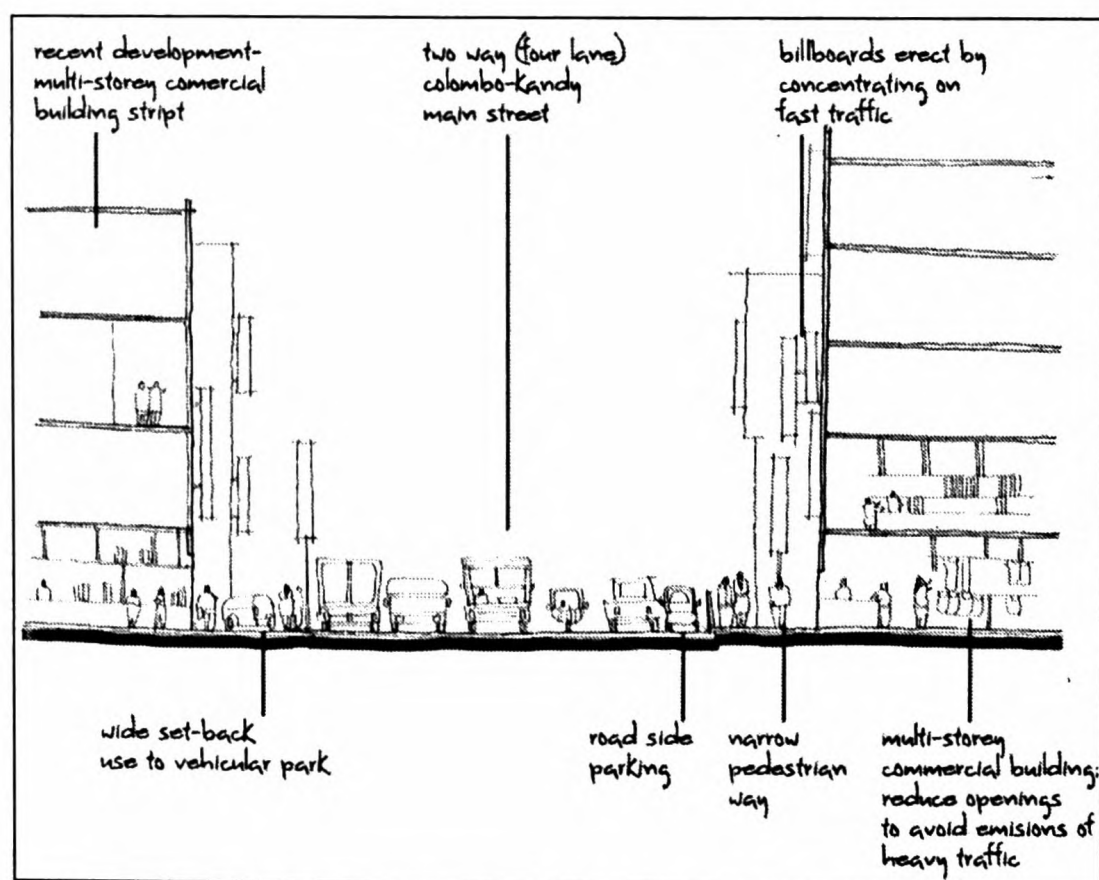


Figure 29: Section across the main street after road widening

Source: Author

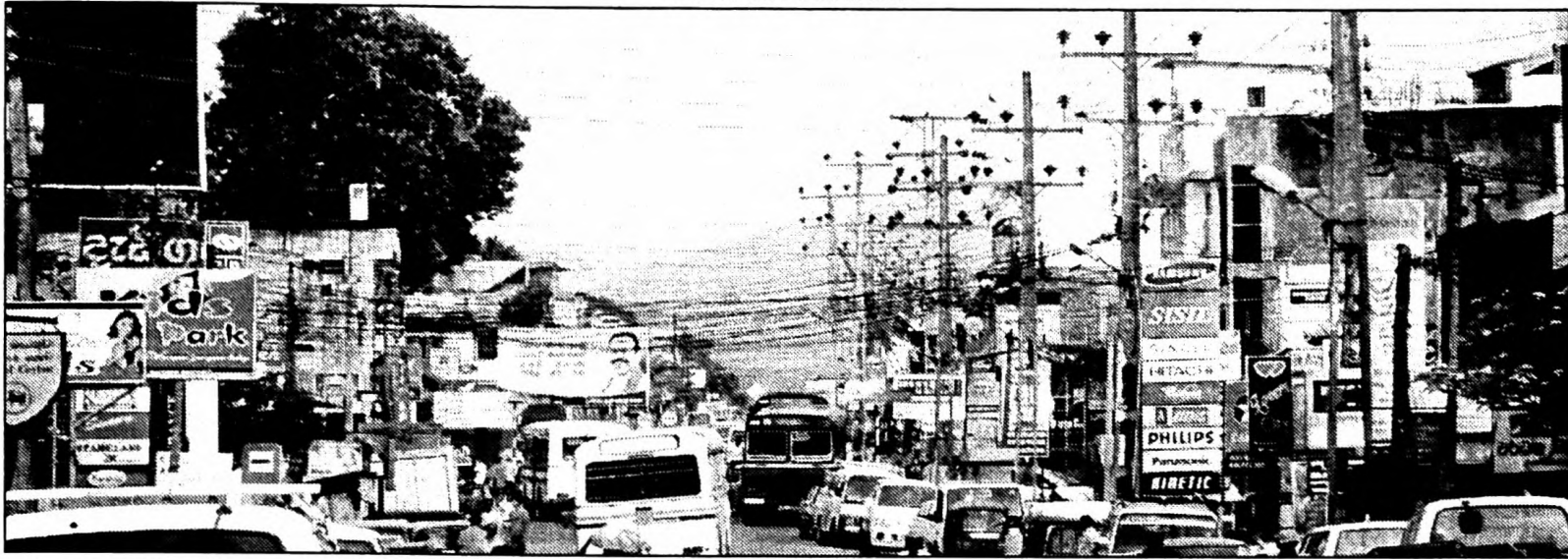


Figure 30: Billboards dominates the townscape that emergence to accommodate fast vehicular movement

Source: Author

Conclusion

With the changes in street environment, inhabitants moderate their nature to control or avoid the emissions of traffic. This is affected on ecology of township and transformed as commercial congested, vehicular traffic based unfavorable living environment. Therefore, traffic should be controlled by remaining opportunity to consume the town centre as a livable street.

(viii) Ability to grasp (Physical Form & Activity Pattern)

With new artery developments, new built forms and open spaces emerge to accommodate new activities along the main street. As a result, past memories and image of the township shift from new arrivals. The significant aspect is most of early memories tie with lifestyle of the inhabitants. Therefore, function of the building is more legible and had the ability to persevering it in mind. Due to the artery development, dramatically township converts to fast heavy traffic. In such context, the image of the township based on road network and emerge confusion among the other elements arrange relate to that.

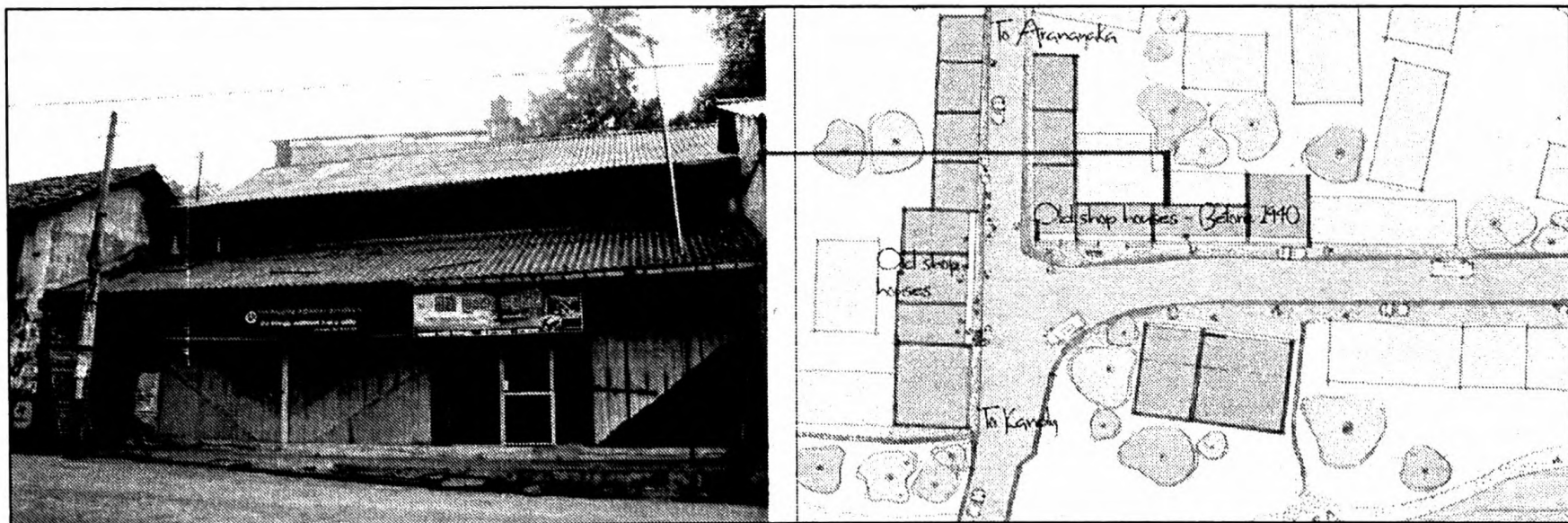


Figure 31: Current appearance of old shop house

Source: By Author

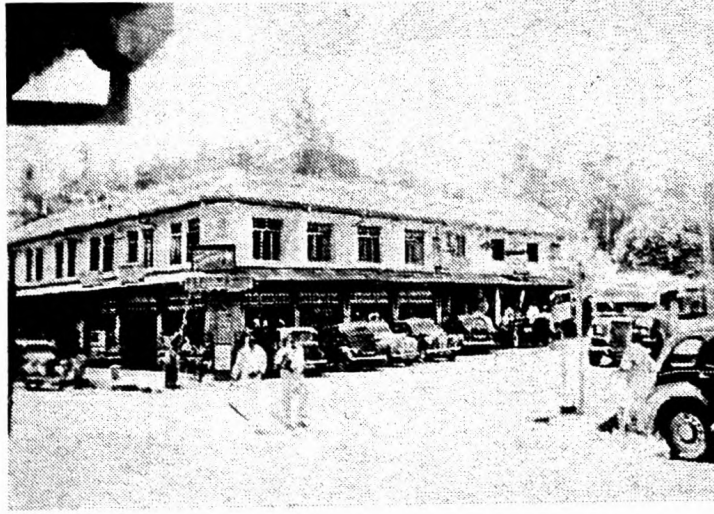


Figure 32: S.O Hotel building (1944),
 Mawanella - Landmark building - 1950
 Source: Gamage, A. U. (1980). *Personal photo collection*



Figure 33: S.O Hotel building (1944),
 Mawanella - 2013
 Source: Author

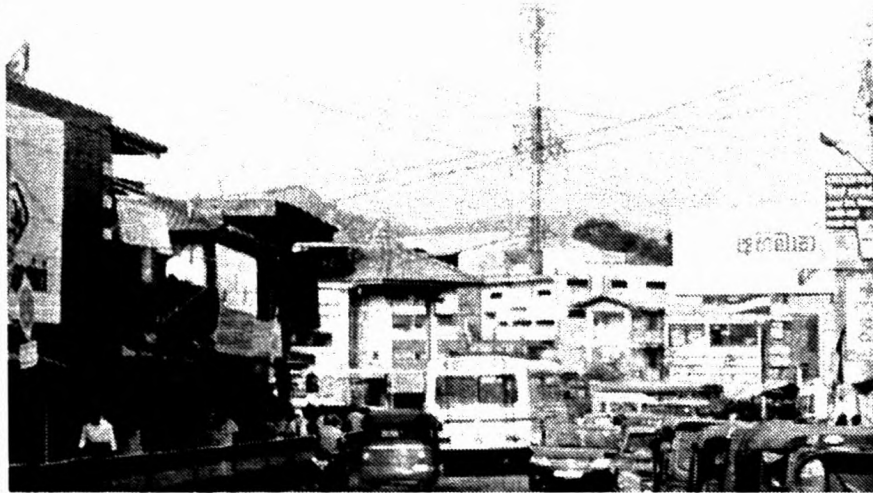


Figure 34: Confusion of form made worse
 Source: Author

Table 04: Mind map analysis

Remarkable elements in mind maps		Respondents								The elements dominate in different stages- along old main street	
		A	B	C	D	E	F	G	H		
01	Colombo-Kandy main street	✓	✓	✓	✓	✓	✓	✓	✓	8	
02	Colombo-Kandy bypass street	✓	✓	✓	✓	✓	✓	✓	✓	8	
03	Rabukkana road	✓	✓	✓	✓	✓	✓	✓	✓	8	
04	Aranayaka junction	✓	✓	✓	✓	✓	✓	✓	✓	8	
05	Hemmathagama junction	✓	✓	✓	✓	✓	✓	✓	✓	8	
04	Aranayaka road	✓	✓	✓	✓	✓	✓		✓	7	
05	Hemmathagama road	✓	✓	✓	✓	✓	✓		✓	7	
06	Old bridge-Mawanella	✓	✓	✓	✓	✓	✓		✓	7	
07	Hassen road	✓	✓	✓	✓		✓	✓		6	
08	Court road	✓		✓	✓		✓	✓	✓	6	
09	New bridge-Mawanella	✓	✓	✓	✓	✓				6	
10	Hospital			✓	✓	✓	✓	✓	✓	6	
11	Food city				✓	✓	✓	✓	✓	5	
12	Pola Para			✓	✓			✓	✓	4	
13	Mayurapadha school	✓		✓			✓		✓	4	

14	Athokorala bakery	√			√		√		√	4	
15	Filling station		√		√		√	√		4	
16	Al-Mubariz building		√		√		√	√		4	
17	Osro Pvt hospital				√	√	√		√	4	
18	Court				√		√	√	√	4	
19	YMB		√	√	√				√	4	
20	Bus stand		√	√			√			4	
21	Kovil-Ktharagama Develaya	√			√				√	3	
22	Peoples' bank				√		√		√	3	
23	Medi Sewana				√	√		√		3	
24	Old shop houses	√			√					2	
25	Super market	√				√				2	
26	S.O. Hotel building	√				√				2	
27	BOC Bank							√	√	2	
28	Depot					√			√	2	
29	Temple			√					√	2	
30	Mawanella-Kandy bus halt			√	√					2	
31	Wijesiriya hotel				√				√	2	
32	Boo tree				√	√				2	
33	Sampath bank				√			√		2	

KEY	Elements emerged along the main street	Elements dominate up to now
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Source: Author

Conclusion

Developments of arteries influence to transform the elements in township. This affects to value and the meaning of township. Therefore, further developments should be occurred by concentrating social, economic, environmental basement. That might helpful to continue the legibility of township and enrich it.

(ix) Quality in variety of sense-experiences and delight (Balance, Proportion, Pattern, Repetition, Rhythm, Harmony & Unity)

Quality in variety of sense-experiences and delight dramatically decrease due to the change of traffic movement. People concentrate on built form to attract speed heavy traffic than entertain the human mind. The decoratively built facades convert to flat built façades that provide easy maintain to avoid hazard from heavy traffic. Therefore, aesthetic enrichment diminishes in chaotic experience.

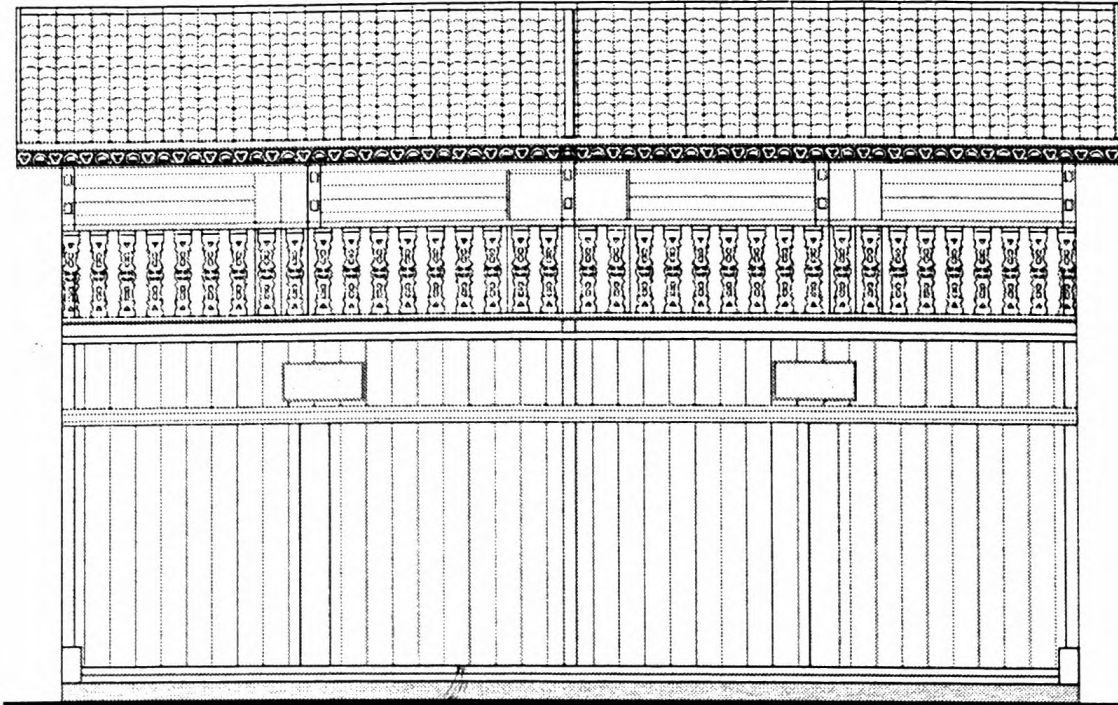


Figure 35: Front elevation of old shop house enriched by design principles
Source: Author

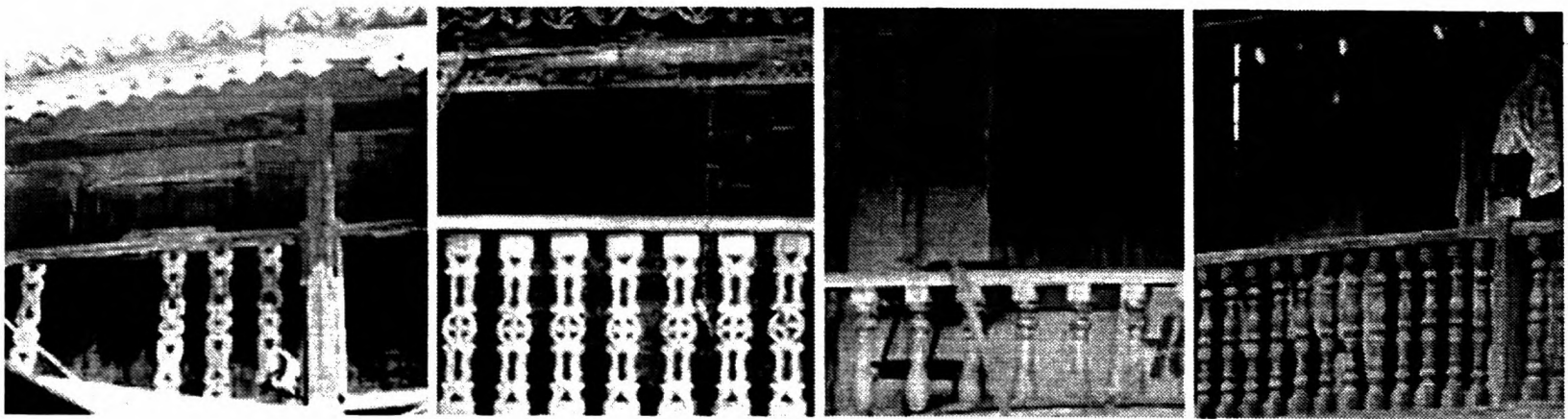


Figure 36: Decorative building façade reveal personalization
Source: Author

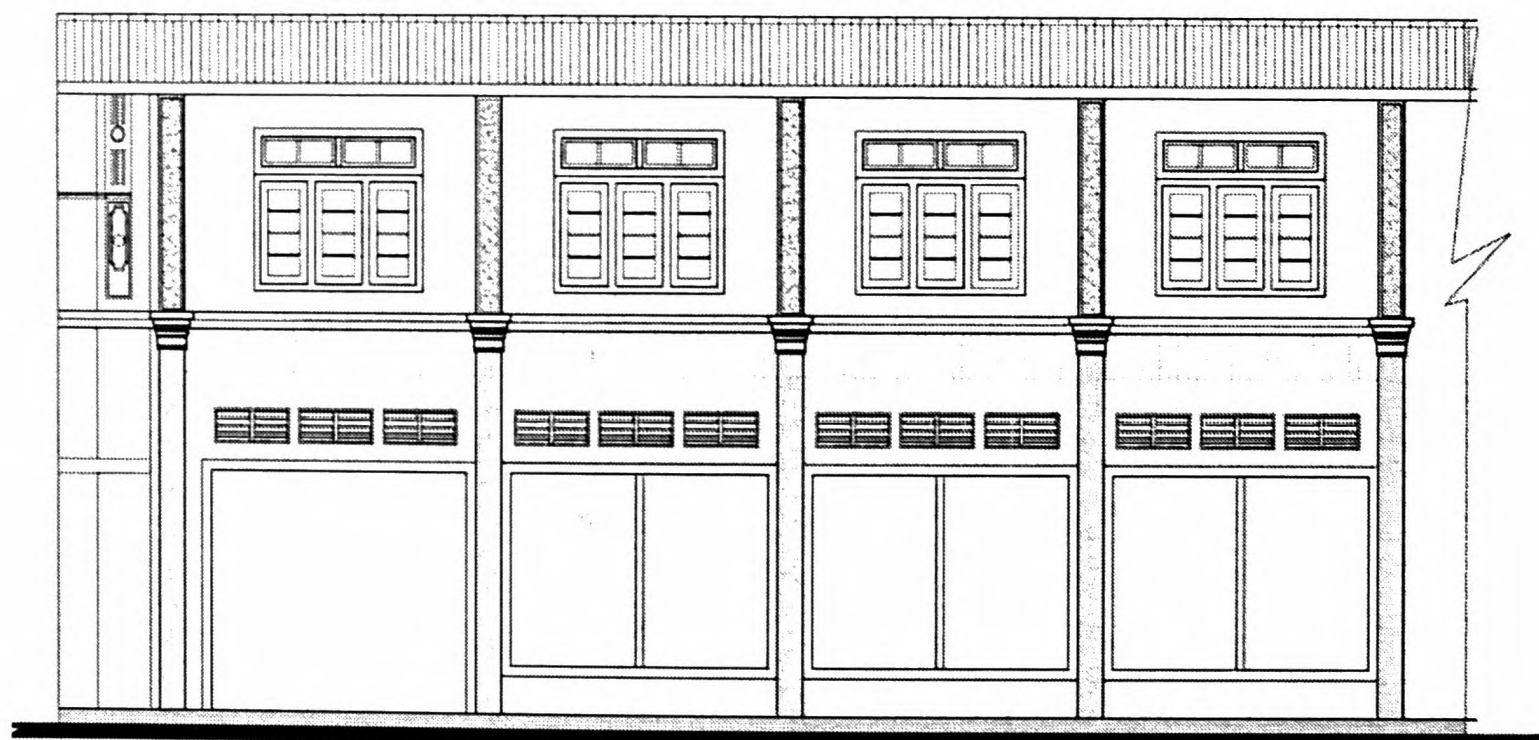


Figure 37: Front elevation of second stage developed building – S.O. Hotel
Source: Author

Different buildings' façades embedded in decorative openings carry out sense of personalization and delightful experience. (See Figure: 38)



Figure 39: Different building façade created by using same materials
Source: Author



Figure 40: Competitive building forms created catholic experience
Source: Author

Building interface is absent of meaningful experience. The factors tie in quality in variety of sense-experiences and delight; balance, proportion, pattern, repetition, rhythm, harmony and unity decay by modern built forms. (See Figure: 41)

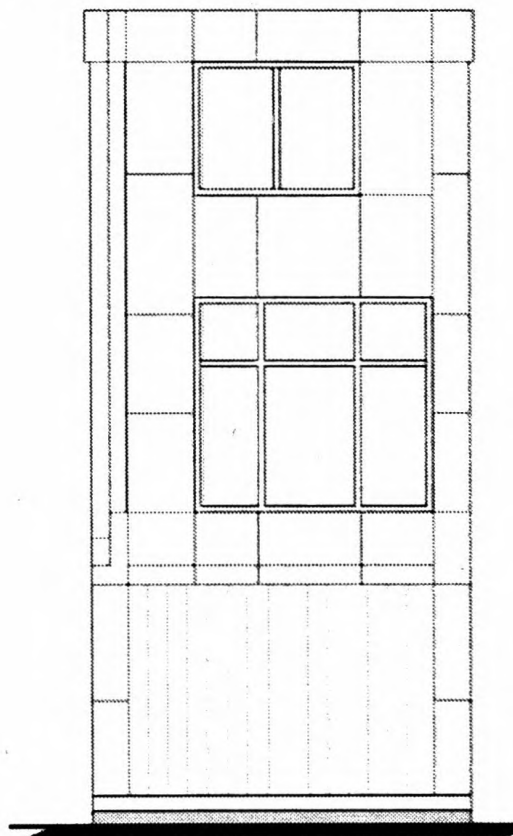


Figure 41: Front elevation of third stage developed building
Source: Author

Conclusion: By providing more spaces for pedestrian the street life can be regenerated. Spontaneously the built environment transforms to accommodate street life with variety of sense experience and delight. Therefore, the planning and regulation should be contained with some guide lines to enrich the quality in variety of sense-experiences and delight.

4.0. Conclusions

Identity of Colonial Township is a more critical factor, which affords distinctive uniqueness to the township to act as exceptional and individual organization. Thus, socio-physical identity becomes more important aspect afforded by form, activity and meaning. Every artifact emerges as social or cultural dimensions. This study establishes nine factors that contribute to understand the transformation of socio-physical identity in colonial township, Sri Lanka. One can argue that the sense of identity is a matter with personal experiences or expressions. Nevertheless, that asserts through dynamic interaction and communication in between human senses and immediate environment. Latterly, the socio-physical identity of township in traffic route reveals as dynamic aspect drives from socio-physical organization that borne as a byproduct of environmental responsiveness of human being.

In Sri Lankan context, the transformation of townships has being pre-dominantly a physical entity of an integrated unit with substantial economic value. In such a context, the infrastructural artery developments such as road widening, development of secondary arteries and introduction of a new bypass road stimulate the colonial township transformation. As a result, town centres are crumbled due to the urban sprawl and losing their identity along the main artery.

Artery developments stimulate the new scales and proportions to accommodate fast, heavy motor vehicular traffic. By means of that, most of colonial townships lost their humanistic quality that highly ties with pedestrian movement. The traffic is enrich the township in alive. Nevertheless, the issue is the development of fabrics only trend to accommodate vehicular movement. This endeavors to reveal that the development of township should be occurred by integration of physical form and human activities. Building height should be respond to the human scale. Due to the high level of commercial value building are to multi-stories or high-rises. In such situation, artifacts should encourage eye level street activities and introduce protuberant elements to enrich the communication with neighborhood buildings and street activities. Thus, it should be conducted for prioritizing humanistic planning process that carefully accommodates people who use space. Understanding the existing image or identity of the town is important to growth, change, preserve and continuity.

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