

**A STUDY OF THE EMERGING INTEREST IN
WATERFRONT DEVELOPMENTS
WITH THE CONCEPT OF GEOMENTALITY**
with special reference to Colombo

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108971N

Degree of M.Sc. in Town & Country Planning
2011/2014 Programme

Department of Town & Country Planning

University of Moratuwa
Sri Lanka

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Dissertation submitted in partial fulfillment of the requirements of
Master of Science Degree in Town & Country Planning
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DECLARATION

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CERTIFICATION

I certify herewith that S. C. M. Senevirathna Registration Number: 108971N of the Honours Degree of M.Sc.in Town & Country Planning 2010/2012 Group, has prepared this Master Dissertation under my supervision.

.....
Signature of the of Principal
Supervisor

.....
Head of the Department
Town & Country Planning

Date

Date

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ABSTRACT

The Urban waterfront have become increasingly important at different levels and in diverse aspects. It plays a significant role for the developments of an urban area which gives many values to the people such as flood management, ecological and environmental balance and control of urban heat. When consider the world context, demand for waterfront developments is very high due to the various reasons. This situation influences to change the natural setting of waterfront characteristics to man-made characteristics.

Even though demand for waterfront land is increasing, no adequate guidance and prerequisite demand mechanism are established. Many projects have been launched spending enormous resources to recover the damage of waterfront environment by relocating and renovating of existing buildup environment from time to time Nevertheless, their results were failed to prevent that waterfront environment. The reason for that lack of proper planning approach and lack of knowledge base for awareness contributed to the waterfront developments.

Although, economic and environmental forces have been studied in the waterfront developments, the socio-cultural and psychological forces behind the development demand for waterfronts are not adequately studied. Therefore, there is a gap in knowledge in understanding of the influence of the socio-cultural forces.

The broad objective of this study is to investigate the forces that promote the increasing demand for waterfronts for developments in Sri Lanka. In order to develop a knowledge base for awareness regarding the emerging demand as an outcome of the broader socio-economic transformation.

Bolgoda lake waterfront area in Kesbewa Municipal Council limits was selected for this study. Interview based survey was conducted in 2015, during which key attributes caused to increase demand for waterfronts were examined. Size of the randomly selected sample is 50 and data were analyzed using cluster analysis technique, content analysis method and MS Excel. Study was carried out with reference to the concept of Geomentality.

Public perceptions regarding to the demand for waterfronts and key attributes associated with the characteristics of Geomentality were investigated. Accordingly,

this study was revealed that there is strong combination between demand attributes and Geomentaity.

In the psychological analysis, the concept of Geomentality explains as a systematically organized part of environmental perception. According to the analysis, majority of the demand attributes related to the attitude based responses were mostly reflected Geomentality characteristics such as Relaxing, Cool environment, Quite and Calmness and also these attributes are prior to the demand. Although the Geomentality is the causative factor behind the increasing demand for waterfronts, some other factors which are not reflected Geomentality characteristics are also effected for the demand.

Further Geomentality of the respondents was checked by author using some variables. According to the results of the variables analyzed using by MS Excel, it was indicated that value of Geomentality based variables is greater than the value of the non-Geomentality based variables. Further it was revealed that the majority of the identified Geomentality attributes were reflected by the high income social group.

Finally, it can be concluded that the water is most important planning element which is comfort of human in physical and psychological. In addition, it brings existing environment in a number of features in term of aesthetic and functional.

Examining these views, present study can help to obtain a better understanding to bridge the gaps between the professional and general public as well as provide the means, by which to develop a knowledge base for awareness.

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CHAPTER – 01

INTRODUCTION

1.1 Research Background

The urban waterfront is defined as “the dynamic area of cities and towns where land and water meet” (Breen and Rigby, 1994). Waterfronts have become increasingly important at different levels and in diverse aspects, including economic, ecological, social and cultural.

When considered the world context, demand for waterfront development is very high due to the various reasons. There are many important reasons to develop new and re-develop existing waterfronts. In the recent times, it seems to be a high level of interest emerging in the developments of waterfronts. people can actually interact with the water in many ways—from swimming, fishing, boat riding and picnicking dockside. Waterfronts are dramatically enhanced due to the increasing of urban population, needs of life and size of cities. In addition, waterfront became not just a place of living and entertain, but it became also the reflection of people’s spiritual and physical culture (Moughtin, 1992). This cultural reflection of people on the physical context of the city can be seen mainly in the increasing demand for waterfront development.

Waterfront developments in European and South East Asian countries have been very popular due to high demand, for example, the demand for waterfront houses in Tarry region in USA and Australia are increasing even though required housing inventory is relatively completed. (Real Estate Magazine, 2013).

In the Sri Lanken context, after ending of the civil war, physical development has been accelerated, in line with this, there is a high demand from local and foreign investors for waterfront developments, such as Beira lake and Diyawanna Oya in Colombo, Kandy Lake in Kandy and Gregory Lake in Nuwara Eliya.

Due to this situation, it is obvious that the physical setting of all waterfront area especially in the urban areas have been changed with socio-economic and environmental aspects.

Along with the demand pressures and new technology coupled with the population growth and rapid urbanization for many years has begun causing negative force to the

waterfront environment converting it in to man-made environment. Due to the construction on waterfront land and sub division of waterfront land, various issues have been arisen such as damage for the biodiversity, conversion of retention area for developments, pollution of the water bodies etc. Therefore, a need of a proper planning approach has been arisen firmly in order to protect the waterfront environment.

Although there are regulatory measures to protect the negative effect forced on waterfront environment, they seem to have failed in many instances. Therefore, recently, many waterfront cities have tried to implement measures by which to protect the ecological balance since over time waterfront became a dead because of some failures of many projects. (Amin, 2005).

Considering the above consequence, it is very important to identify the demand for waterfront development and guide for waterfront development. However, it can be seen that there is a gap in the understanding of the demand for waterfronts and their developments. Therefore, it is important for Planners to identify the nature of the demand and the type of development pressure for waterfront land in order to develop a knowledge base for awareness.

1.2 The Problem Statement

Waterfronts are dynamic and have undergone constant change from the time that humans settled down. Specifically, urban waterfront go through several phase of development to meet various human needs at different period of time. The waterfront lands which were neglected for some times, mostly used as backyards have become high priced properties and recent time demand for the waterfront land has been increased rapidly. This change can have both positive and negative impacts on both on the water body and the land.

Modern urban waterfront development was initiated in the United States. This activity was mainly conducted to convert abandoned industrial waterfronts to commercial or mixed use activity. Waterfront area, in an urban area is a significant land use character due to development potential for various sectors in the urban development process, and it provides opportunities for the developments of social, physical, economic and

environment sectors. Increasing population, rapid unplanned changes of land use, unplanned settlement expansion are being caused to negative influence for the waterfront environment.

The developments of the waterfront land have been taken place without proper understanding about the role of waterfront such as bio diversity, control of urban heat and flood storage capacity. Therefore, contradiction between the role of waterfront land and its development has not been addressed so far in Sri Lankan context. Even though the demand for waterfront has been increasing day by day, there is no prerequisite demand mechanism to guide the developments.

Many projects have been launched spending enormous resources to recover the damage of waterfront environment by relocating and renovating of existing build-up environment from time to time. The reason for that people's perception regarding the waterfront developments in our society and the lack of knowledge to aware the importance of waterfronts. On the other hand, lack of proper planning approach contributed to the waterfront development is another reason. What is required therefore, is a sound framework to understand the demand for waterfronts. The available knowledge on this is inadequate to explain the phenomenal situation in order to develop such awareness.

With a better understanding of the major transformations and driving forces involved to the waterfront developments, numerous factors need to be carefully considered in order to identify the peoples' perception; otherwise contradiction between waterfronts and demand for it become a critical issue in urban planning in Sri Lanka. In other words, urban waterfront development is complex, multi-purpose and challenging. Many issues may be encountered throughout the whole planning context. The Physical planning and demand mechanism for the waterfront land are crucial to maintain the environmental balance. The present study is mainly concerned with demand attributes related to the social, cultural and psychological aspect for waterfront development with its effect for land use changes and the social group who are interesting demand for the waterfront developments.

Although, economic and environmental forces have been studied in the waterfront developments, the socio-cultural and psychological forces behind the development

demand for waterfronts are not adequately studied. Therefore, there is a gap in knowledge in understanding of the influence of the socio-cultural forces.

Considering those phenomena there is a need to develop a sound framework so as to understand the increasing demand for waterfronts in planning point of view.

1.3. Objective of the Study

The broad objective of this study is to investigate the forces that promote the increasing demand for waterfronts for developments in Sri Lanka. In order to develop a knowledge base for awareness regarding the emerging demand as an outcome of the broader socio-economic transformation, this study intends to investigate the situation in Colombo.

1.4 Scope and Limitation

The scope of this study is limited to consider only the related concept in relation to the increasing demand for waterfront developments in the study areas and identify the demand attributes affected to waterfronts. Study is not to evolve a comprehensive urban development framework. The study mainly provides approaches to the causative factors behind the increasing demand for waterfront developments which are integrated to urban development. The selection of waterfront area for the study is limited to Kesbawa Municipal Council limits in Colombo.

The theoretical framework is based only on currently available literature during the period of study. Under the empirical work, it limits to do interview based survey on randomly selected sample of 50 respondents and observation in study area due to the time and resource constraint.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The Objective of this chapter is to review the theoretical aspects in relation to the preference for waterfront demand and centered in, human-natural relationship and the trend for waterfront developments in the context of local and foreign. With that it will assists to investigate the relationship between the preference for waterfronts and causative factors behind the increasing demand for waterfront developments.

2.2 The Environmental Determinism and Concepts

The environment was mostly taken in its physical sense and this physical setting was considered to be imposing conditions upon behaviour of people and therefore, was the major (Gifford, 2007). This ‘deterministic’ view towards the environment is evident in environmental cognition and environmental behaviour.

Accordingly, following theories and Concepts were reviewed to frame the research study.

2.2.1 Effect of the Environmental Psychology to Waterfront Living

Nature is one of the main components of the environment. Among the components of the environment, It is the nature that gives shelter for the human being. Consequently, it is simply connected with man’s behaviour and his mentality.

In a nutshell, we can go through some definitions of experts in the field of Environmental Psychology. As per their interpretations, “This is a field of study that examines the interrelationship between environments and human attraction, cognition and behaviour” - (Bechtel & Churchman 2002; Gifford 2007; Stokols & Altman 1987). Moreover “The field has always been concerned with both built and natural environments” – (Stokols 1995; Sundstrom, Bell, Busby & Aasmus 1996). As is typical, more environmental sustainability impacts have become a severe stumbling block to the society as well as to Social Sciences specially. To study this field in a

systematic manner, it is aimed at human attraction and natural environments and how they are affected each other.

On this ground, this is subjected to find individual and collective level behaviour and to seek interference which is relevant to every criterion herein. Further it gives high weight on problematic situations and makes use of theories, methods and findings of concerned disciplines in need.

As a result of urban settlements and human activities, every remarkable structure of the nature is going to be devastated. If they can secure their natural beauty as it is, it is very seldom that they can be seen in a perfect condition ever i.e. natural wilderness. According to Environmental Psychology, human beings are very versatile with the environment and they seem to be using resources thereof in a creative manner as per their day to day needs. Consequently, the urban parks and waterfronts of theirs show the immense potential they have.

In pursuance of the environmental psychology, mental model is a highly simplified version of reality it is more related to human beings. Whenever they want to have better understanding of things, they use their storage in their head where the highly simplified version of reality lies. As all we are natural creatures, always try to be satisfied with the natural entertainments. With the help of many experiences of people, knowledge is stored in portable models and they lead to make decisions with the use of it. People usually try to put them into practice in building purposes and putting them to the test beyond the reality. Nevertheless, this understanding of the humans is obtained through direct and indirect experiences.

There are more terms with regard to place attachment and sense of place. Atlamn (1996) says – “Many different perceptions of the bond between people and places have been hypothesized and studied”. “The place attachment is defined as one’s emotional or affective ties to a place, and is generally thought to be the result of a long-term connection with a certain environment” – says Robert Giffort 1997. The elegant and graceful value of the environment depends on one’s thoughts and feelings along with that it is demonstrated the connection between the environment and people

in-depth. The emotional status of people on something attractive is varied from a simple attractive response. This difference is cleared by the Schroeder as “meaning versus preference” in his case the definition of “meaning” is “thoughts, feelings, memories and interpretations evoked by a landscape” whereas “preference” is “the degree of liking for one landscape compared to another” As a matter of fact, it is more important to have deeper and lasting emotional attachment to continue a last- long relationship with a place. Uturu (in Nigeria) in his point of view “it has direct relationship to level of community development”.

Through Environmental Psychology, it tries to put effort to form the humans’ mental models in other new ways using humans’ inherent needs and capabilities. Psychology shows people often prefer to live in the environment receiving recreations with water. As water associates with membrane and protein surfaces, it assists the existence of humans more. Angele, (1974). Apart from this, water has a spiritual power and with this reason people are psychologically caught to this.

2.2.2 Behavioural Geography and Waterfront Amusement

As specified by R.M. Daniel, Behavioral Geography is “An approach to human geography that attempts to understand human activity in space, place and environment by studying it at the disaggregate level of analysis – at the level of the individual person”. Further he explains that human environment relations are dynamic and bidirectional. Physical and social environment affect people’s actions and mental states. On basis of different faiths, believes, ideas and opinions behavioral geography is a discipline adapted to various subjects i.e. subfields of psychology, behavioral and cognitive disciplines such like linguistics, economics, anthropology and environmental disciplines like planning, architecture and urban studies.

Following W. Gray Evans (1980) – “The behavioral geography investigates human action in geographic space as mediated through the cognitive processing of environmental information”

Behavioural geography is largely analogous with the environment which connoted by the human behaviour and as well as with the people who are straight and neutral for

every problem. This is centered with connections between multi – dimensional and multi-faceted systems of human activities. It is interfered via the sense, perception, feeling and cognition as active processes of identifying and learning about places diligently including the mind involvement between the environment and behavior. Tommy Garling (1993) in his definition says – “Behavioral geography grew as a reaction to the absence of individual action in the models of spatial science that rose from the quantitative revolution in geography during the late 1950’s early 1960’s”. Due to the man’s transition to economic and to rational stage with mechanistic and deterministic nature of quantitative models was dissatisfied by the researchers. Based on Several hypotheses, individuals were totally logical and in their spatial actions, optimizers were oversimplified. To empirical studies introduction of the randomness was made and it is followed by a collection of cognitive variables which are general to psychology. Taking the contribution of ‘window’ of an individual – the thoughts, decisions and wisdom this behavioral geography tries itself to construe the geographic world with an eye to supplying an insight into human spatial processes by learning relevant processes themselves. It is further explained by way of Behavioral study the desire for environment, far from economic, social, physical and for the inclusion of perceptual, cognitive, philosophical, ideological, and sociological, this is spread. This is focused on a more micro level, is processed and more than arbitrary criteria, generalizations are stood on behavioral responses, likewise, demographic and socio economic indices location.

To study Individuals’ spatial activities, behavioral geography is mainly used, applying individual’s knowledge, wisdom or understanding of the natural and environmental substances on the ground making options to whether evacuate or attract. This subject is stretched over number of special processes, they are kind of studying of mental and cognitive maps, attraction of meaning of places. Environmental learning, spatial search behaviour, spatial reasoning, way finding. When it is looking for cognitive component in spatial behavior viz how person finally taking a turn them into the most accurate details what they gained after gripping, coding, storing, recalling. This fundamental interdisciplinary, much of the literature cited here has been published not

only within geography and cartography, but also within psychology, linguistics, and other fields.

2.3 Research from the point of view of Users

People perception for successful waterfront developments and its demand are largely formulated from the point of view of waterfront developers. On the other hand, waterfront developments were investigated in focus of academics and professional research from various disciplines. Identifying demand factors may be done in many ways. For example, new materials, design, physical and psychological aspects, planning and building regulations etc.

According to Rapoport (1990), “It is thus users, meaning that is important, not architects’ or critics, it is the meaning of everyday environment, not famous buildings-historical or modern.” Meanwhile, in general the demand for any goods or services is depend on purchasing power.

In contrast with many case studies described from the point of view of experts only a few studies are conducted through the perspective of general users. Even among the famous works mentioned above, few note the importance of human perception. In the third part of *Recreation and Tourism as a Catalyst for Urban Waterfront Redevelopment: international survey* (1995), two Japanese studies introduce and discuss the perceptual perspective.

Other studies may be found in relevant research areas, such as environmental psychology and behavior, or cultural landscape perception and evaluation. The following table summarizes selective works to identify the demand attributes for waterfront developments.

Table 2.1: Selected Studies on Demand for Waterfront Developments

Reference	Site Location	Factors/ Indicators	Data Collection	Data analysis
Yumashita and Hirano (1995)	2 rivers, Japan	6 factors: Quality of water, The scale of the river, The seasonal changes to the scenery and landscape, Potential quantity of recreational experience, Facilities, Safety	Questionnaire: 272 (Muromi) and 1680 (Naka)	Log-linear model & logit model analysis
Zhang (2000)	4 Riverfront sites, Shanghai, China	Visual and Functional aspects; Lynch's theory: "interaction city"	Questionnaire, 74 on site users Cognitive mapping	Qualitative analysis
Campo (2002)	3 waterfront districts, NY, US	Access range, Level of interaction with water.	Participant observation	Qualitative analysis
Tang (2005)	Open space of urban waterfront	7 characteristics (Safety, Accessibility, Comfort, Proximity of water, Interesting, Visibility, Diversity)	POE Questionnaire 60 professionals	Analytic Hierarchy Process (AHP) analysis

Source: Adapted from Yumashita & Hirono, (1995)

In general, studies can be categorized in to two types according to their research purpose. One is direct and deal with satisfaction and expectation; the other is relatively indirect and psychological effect for attraction for waterfront living. Yumashita and Hirono (1995) identified six important factors related to the residents' perceptions of two rivers in Japan. These six factors are Quality of water, The scale of the river, Seasonal changes of the scenery, Potential quality of recreational, facilities and Safety.

According to Harold Proshansky's (1987) exploration, as a person interacts with various places and spaces, he/she is able to attract which properties in different environments fulfill his/her various needs. When a place contains components that satisfy a person biologically, socially, psychologically and/or culturally, it creates the environmental past of a person. Through 'good' or 'bad' experiences with a place, a person is then able to reflect and define their personal values, attitudes, feelings and beliefs about the physical world.

2.4 Urban Waterfront Development as a Strongly Preferred Area

Water can be identified as a very useful planning aspect for the comfort and survive of human physical and psychological. Furthermore, by means of that, it reaches the man through various aspects of the existing environment for their amusement and recreation. It brings physical environment in a number of features in term of aesthetic and functional. (Onen, 2007).

Natural water is of a more importance task in urban area, giving exquisite things to human. They are in various aspects such as visual, audial, tactual, and psychological. In psychological aspect, these waterfronts are in the urge of giving benefits of their sceneries as a power of attracting people and for them to have consolations. All through, water related piece of works always have sense of purity, tranquility, and movements constituents. Flowing water (Figure 2.1A) accommodates the environment a strange excitement, bliss and joy. Stagnant water (Figure 2.1B) always visualizes a snapshot of minds as a reflection. According to Aksulu (2001), water is used commonly as reflection element by means of the optical properties. To a large extent water is used as a transparent body through visible properties. Water, since it features characteristics such as its stillness, purity, deepness brings to the environment and surroundings glamour and a beautification exaggeratedly. Except its deepness it conveys messages of heart healing and it makes a man to be a comforting situation.

Figure 2.1:(A) The mirror effect of water, (B) The vibrancy effect of moving water (Onen, 2007).



Source: Adapted from Onen, (2007)

The important aesthetic parts are psychological things. These outcomes are sentimental feelings that man can ever understand with consciousness. Water that links with the human life is bound to responses arising from human life. Human beings are prone to water which is a pivotal segment for the survival of our life psychologically. Water that is still, delicate and freshness that allows man's live entertainment and great healthy.

2.5 Research on Geomentality and perceptions on the Necessity of Waterfront Development

2.5.1 The Concept of Geomentality

This concept was introduced by Hong-Key Yoon in 1986, in his sense, "it is explained as an established and lasting frame (state) of mind regarding the environment". Yoon-1986 says. "it is needed to translate into a particular behavioral pattern in dealing with the environment, and is reflected in pattern of cultural landscape Geomentality is based on a person's and group of persons' views and opinions on geographical environment". What is the opinion of a man of a building? Geomentality similarly relates to a pattern of cultural landscape. At last it accounts for a cultural landscape development.

When the Geomentality is ascertained, accordingly, it is crucial to make clear the pattern of cultural landscape in a deep manner rather than prevailing orders. Any building or any excellent category design consists in Architect's design which lies eternally and is followed by many builders. Subsequently, on hypothesis of Architects, pattern is merely affected by the Architects' nature, or personality or else mentality of the mind when their cognizance of pattern of cultural landscape occurs. No such definite term has been made for defining the specific mentality of mind drawing to a pattern of cultural landscape. Therefore, in view of the above patterns of cultural landscape or panorama, it is more significant to consider the gravity of Geomentality and to explain such a conception and the advantage of it.

2.5.1.1 The Background to Main Stages of Geomentality

In the opinion of Hong-Key Yoon -1986 -"Geomentality is based on three premises".

Premise 1. Mentality often collaborates with the way of one's thinking pattern about something which is called the mindset and nature or personality of one's mind. But there are a few exclusive thought and perception and cognition which are impertinent to kind of that aspect of mind that is abandoned its prevalence by that hypothesis.

Premise 2. As a whole, some sort of mentality is based on Geomentality. Human mentality covers various kind of areas. To give instances, there are different sort of groups such as political, racial other than joy oriented, love oriented, hate oriented, fear oriented which bare miscellaneous opinions and views on something concerned to the group mentality. In a political party there may have socialist, liberal ideas holders. In a roundabout way, we can say that every people has exceptional mindset of a geographic environment. In other words, it connects with premises, lands, therefore it is called Geomentality. Generally, this acts as a role model for individual and group mentality.

Mentality of a man and geology are related in several ways Man has always sought to explain his natural environment, Based on a historical survey of the origins and development of the Hindu religion and its absorption of Buddhism the author outlines that tolerance, gentle behavior, profound optimism and a lack of obsession with time are the main features of Indian mentality Moreover, the traditional Chinese mentality

is based on Yin-Yang and there is the five aspect theory that the all things and events are explained into two (yin and yang) or five (fire, water, metal, wood and earth) varieties. By means of these features, their perceptions on landforms simply demonstrate this Chinese mentality.

As per the ancient Chinese Yin-Yang and the Five Element Theory “landforms (including mountains and hills) were divided into five categories with regards to traditional China”.

A mountain with a sharp peak was a fire mountain

A mountain with a bell shape was a metal mountain

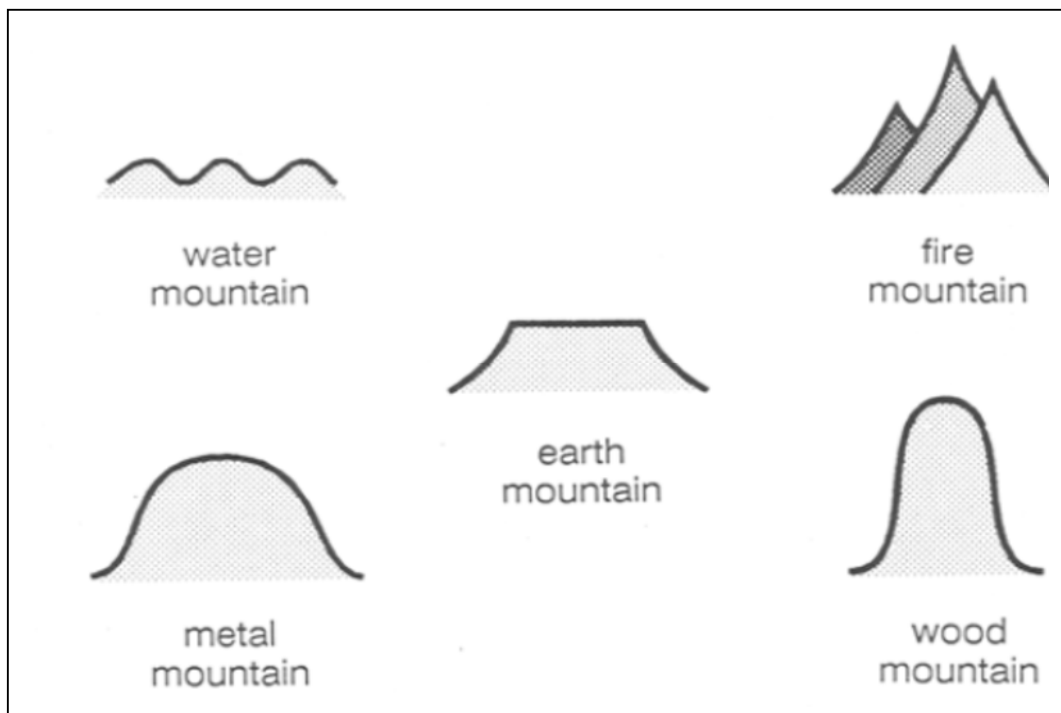
A mountain with a flat top was an earth mountain

A mountain projecting like a poplar tree was wood mountain

A mountain with hills rolling like waves was a water mountain

We can see the exact mode of so called five mountain types as follows. (Figure 2.2). This landform categorization was the basic and most leading arrangement prior to the inception of the modern Geomorphology in East Asia. Altogether, this landform categorization can be identified as a Chinese Geomentality that appears as an important segment of Chinese tradition.

Figure 2.2: The Ideal Shape of the Mountain Type



Premise 3. Mental situation of a man can be arising as a result of his certain stream of behaviour. Most of the time, a person's actions and conduct may be typical and foreseeable. Human behaviour is a crucial part of psychology. Everything you do and say tells the world about what's going on inside of you. So it is probably a likeness or mirror image of our mentality otherwise thoughts. Such array of every physical action and observable emotion associated with individuals can be made clear by the study of mentality of theirs. Behavior which occurs out of the track incidentally is impossible to be clarified. But it does not degrade the general rule which expresses that a pattern of behavior is simply an exact reflection of an individual's or group's cast of mind. Like, most probably people have behaviour away from their certain movements' styles, as an example we can see, at sometimes most vegetarian people pretend to be vegetarian except taking meat for their meals. But to tell you the truth, it is averse to the usual method. As because the vegetarian, they most of the time go beyond the reality of being vegetarian i.e. from their natural behaviour. There are many unique characteristics of man off their distinct mentalities. Somehow or other as man is a dynamic spirit creature, they differ according to the situation. As described by Tatsui, 1953 – “Just as person can have exceptional behaviour outside a normal pattern; there can also be sporadic ideas which are exceptional to one's mentality”.

As a result of learning of a cultural landscape pattern, the benefit of the Geomentality could possibly be better as defined it by the comparison of this approach along with conceptions similarly, environmental perception and mind mappings and also that is considered to be research tools that geographers have exercised extensively. A stable and well organized aspect of temporal anomalies is indicated by the conception of viewpoint that covers standpoints, thoughts and panorama. This viewpoint doesn't seem to have waggish and impermanent outlooks and rather it is a sound condition of one's mind for a long term. Notwithstanding, this a conception that is far connected with geography and has geographical happening in some extent (e.g.; world view of life and death or that of love, friendship etc.).

In Geography, the environmental perception concept has been exercised. One's ideas on environmental consciousness based on the environment and people's thoughts and knowledge of it and also are less waggish and impermanent. The conveyed and

recorded amusing speculations and impressions go without the intentional purpose. So that actual behavioural patterns do not show one's perceptions and thoughts on environment or in reverse too. According to Bunting and Guelke's criticism on the assumption in perception studies - 1979 "there is a strong relationship between environmental images and actual behavior".

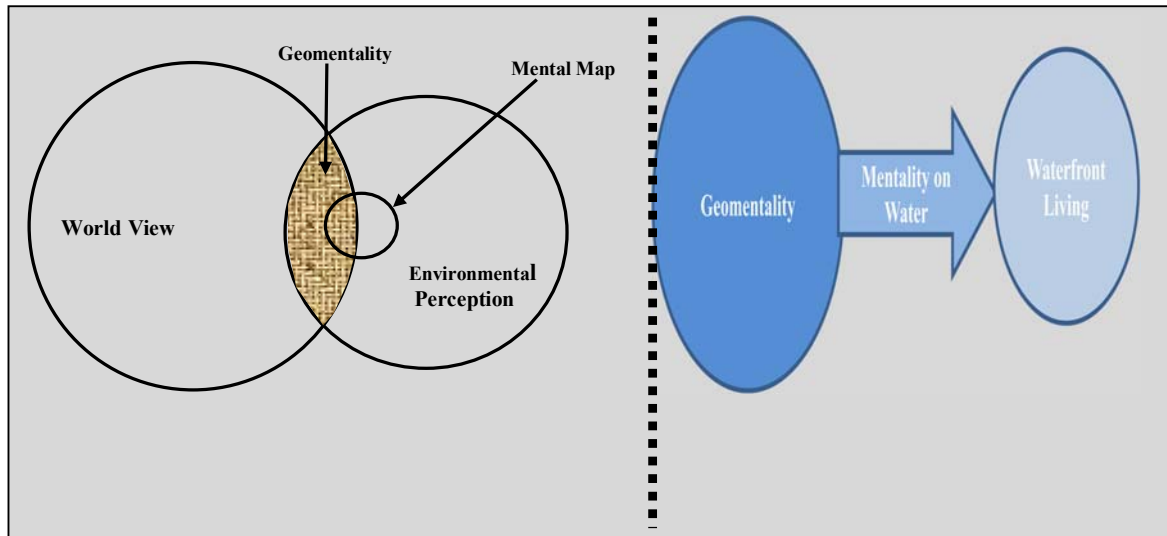
With the length of people's desire for residence, the approach of mental map in geographic research and the mapping thereof have mostly been linked. Therefore, the mental map is identified to be a fragment of environmental perception.

As to above concepts, there seems to be subsequent benefits in Geomentality when the cultural landscape patterns are described. Geomentality is not alone a weight of a place choices (especially residential); that is all about with geographical experiences contrasting to the world community vision of the broad concept and that is apart from weird (unplanned and in kind thoughtless) sentiments.

Geographical phenomena cover the various segments of environmental perception or the world understanding which are in order and well organized are only comprised in Geomentality. Diagrams that come in next will show this nature and the overlapping part of world view and environmental perception is deemed to be Geomentality (Figurer 2.3)

Figure 2.3: Interconnection made among World view, Mental map, Environmental perception, Geomentality and Mentality with the help of Geomentality to Waterfront Living.

Figure 2.3: The Relationships among World view, Mental map, Environmental perception, Geomentaliy and Mentality formed by Geomentality to Waterfront Living



Source: GeoJournal,1991 and Author, 2015

2.6 Intimate bond of Maori people to Maori Land

The Maori people have firm contacted hearts to their land in which they live. Their thought to the land is spiritual and sublime thereof it is considered as a gift of God. The Maori people have always maintained a transcendental bond with their land which was treated as a dearly loved person. This special bond is still clearly visible when observed Maori people who living in remote home village. The people thereof being with a passion for the so called land. Even little things are considered very high importance to their life. Relationship with the land will become cold and ties with it will be lost. (Yoon, 1986)

Maori people still deeply love their land. People regarded their land to be divine in association with the linkage there with. They treasure even a small piece of land in their home territory though it may have little market value. Professor Raymond Firth presented a brief but superlative discussion on Maori land in terms of its tenure, title, boundaries, transfer and the people's sentiment for it. In the study of people's attitudes toward environment, an appreciation of folklore, of which proverb is a genre,

can be most rewarding for it contains some of the finest raw data concerning people's mind and behaviour (Yoon, 1979). Proverbs are a distilled expression of a people's wisdom, ideas and values. Maori proverbs can effectively reveal Maori attitudes toward land. Land has more than economic value: it is beloved and revered as the ever-living mother. The Maori proverbs illustrates the economic value of land in the traditional Maori culture. To Maoris, land was the ultimate support of life; although they drew a large part of their food from the sea, the land provided the staple part of their diet and the other items necessary for their general welfare. Without land, no Maori was either dignified or free every Maori had their home territory, where their belonged and were accepted. Disputes over land were one of the most common causes of Maori warfare. The loss of ancestral land was the loss of 'the place to stand' (turangawaewae). The Maoris love and value their land so much that they even lay down their own lives for it. As per Yoon – 1986 "This view is still alive and is clearly reflected when observe Maori life style"

Geomentality Characteristics

- Mentality as an established and lasting frame ((State) of mind regarding the environment.
- Mentality as systematically organized part of environmental perception.
- Patterns of thinking regarding the living environment.
- Fixed view in dealing with environment
- Integral part of individual or group of people dealing with land.
- A pattern of human behavior is the outcome of a certain mentality.
- Form and function of the cultural landscape are probably like the two side of a coin.
- Geomentality may function as a critical factor in the perception of the environment and it differs from environmental perception.

Source: Maori mind and Maori Land, 1986

When study the people perception on preferences for waterfront living along with the related theories, concepts and studies, the most related concept for the approach for investigate the people perception on waterfronts is the concept of Geomentality. Therefore, the concept of Geomentality was selected for the research study.

2.7 Conclusion

This chapter briefly reviewed the related Theories, concept and Studies which were provided the back ground to investigate the causes behind the increasing demand for waterfronts. consequently, the “Concept of Geomentality” and attempts to define such a concept and explore its characteristics in explaining the patterns of cultural landscape is based. However, it is revealed that emerging interest for waterfront developments in Sri Lanka was not still investigated in the psychological aspects. Even though economic and environment aspects have been reviewed in relation to the waterfront developments. Obviously it indicates that the city planners in the countries like Sri Lanka are either not much aware of emerging interest for waterfront developments in the point of view of psychological aspect or there is a knowledge gap. The next chapter onwards will put much attention on demand attributes and make efforts to bridge the gap.

CHAPTER 03

RESEARCH DESIGN

3.1 Introduction

This chapter presents the development and formulation of the conceptual framework of the research study, methods of preparation and assembly of the data to achieve the objectives of the study.

For the study, qualitative approach was used to identify meaningful structures of people's responses to demand for urban waterfront land and visual features of those scenes on the basis of attitudes behind the increasing demand for waterfront development about that kind of environment at Bolgoda river area in Sri Lankan context. The features of the environment salient to those responses based on what people understand about the environment, how they value it, and what their principles are for using it (Harding, 1974; Kupritz, 1996). It is a process for articulating and emphasizing people's needs and purposes with equal emphasis given to qualitative method (Stokols, 1988). The chapter is also explained the data analysis procedure and cluster analysis technique and content analysis were applied to analyze the interviews and the observed information on selected study area in Sri Lanka.

3.2 Research Question

As reviewed in literature, the demand factors for waterfront developments are different from the demand factors for other developments in inland and the social group who demand for the waterfront developments is also different from the developments in the inland. The demand for developments as well as the regulatory measures are driven by different forces. Considering the above gap in the waterfront development field, this study attempts to investigate the equations between demand attributes and Geomentality characteristics as expressed in Sri Lankan context. Accordingly following research questions are arisen to investigate through the study.

1. What are the key attributes in relation to increasing allegiance towards waterfronts?

2. Can the attributes that amount to Geomentality be observed in the present demand for waterfront?
3. If so, what attributes of Geomentality contributes the most to the demand for waterfronts in Sri Lankan context?

The above questions mostly remain unanswered by many empirical studies. Although, there are several studies conducted in Western and European waterfront developments with regard to economic and environmental factors. In general, the true needs and preferences of the users for waterfront developments could not be interpreted effectively by investors or professionals. Therefore, this study comes in handy to bridge the gap.

3.3 Method of the study

The studies mentioned above provide different research methods in terms of study area or sites, Specific factors, as well as data collection and analysis. The study area is founded based on residential environment. Waterfronts can be viewed as a specific type of built environment. A number of studies directly use some general framework to analyze or assess waterfronts. In this study, various research approaches and methods were reviewed to achieve the broad objective described in chapter one. After reviewing the suitable research method, the combination of qualitative and quantitative research methodology was adopted for this research study. And also cluster analysis technique and content analysis were used. Therefore, incorporation of both qualitative and quantitative research approach helped to investigate the Geomentality characteristics of the demand attributes with regard to the increasing demand for waterfront developments.

The research was based on face to face interview and direct observation to investigate the equation between demand attributes and Geomentality characteristics. The interview was comprised of demographic data such as Age, Gender, Marital states, occupation, Education and Monthly income and in the second part of the interview, author asked reasons for the interest for waterfronts such as relaxing, cool environment and compared demand attributes with Geomentality characteristics. In

the third part of the interview, author attempted to check the Geomentality of the waterfront residents whether the demand create based on Geomentality or various other reasons. For that asked several questions aiming to check the Geomentality such as “Do you like to resale this property?” “Do you like to rent out this property?”(Outline of the interview sheet has shown in Annexure - I)

According to the Geomentality characteristics have been identified by H.K Yoon though the research in “Maori Mind, Maori Land” Maori people do not like to alienate their land forever, land alienation is considered as the death of the land. Considering that above questions were created.

3.4 Assumption for the Research Study

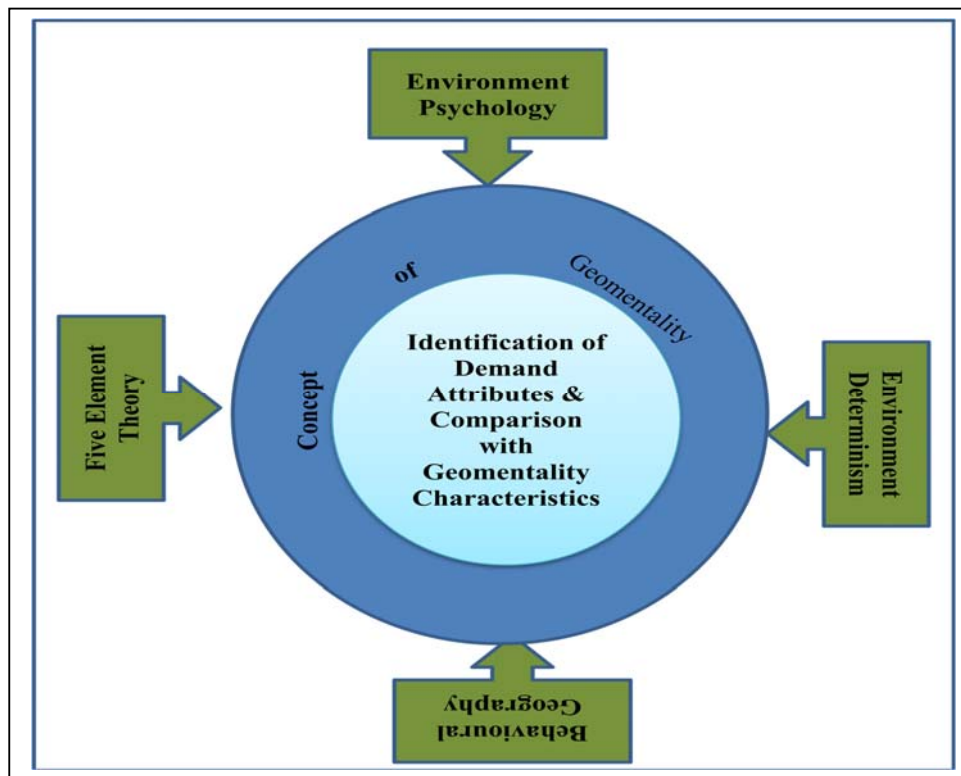
As described in literature review, people who have systematically organized part in their mind regarding the environment perception is based to interest for a certain place (Yoon, 1986) considering that concept above assumption has been developed to investigate the demand attributes.

Some attributes are fundamental, and may be found in almost every principle and criteria. The aspects cover certain important attributes that can be investigated separately and in depth. The aspects are also interrelated, and their relationships can be further analyzed and discussed. However, such discussion is often ignored by researchers and developers. The aspects are not abstract. But have not been studied on social – cultural and psychological aspect of human scale. The results and findings reflect the true needs of users.

3.5 Conceptual Framework

Some consideration of the factors predominantly addressed by most of the researches, availability of data and its relevance of the context of the research. Following aspects are investigated to analyze the increasing demand for waterfront developments with the concept of Geomentality.

Figure 3.1: Conceptual Framework

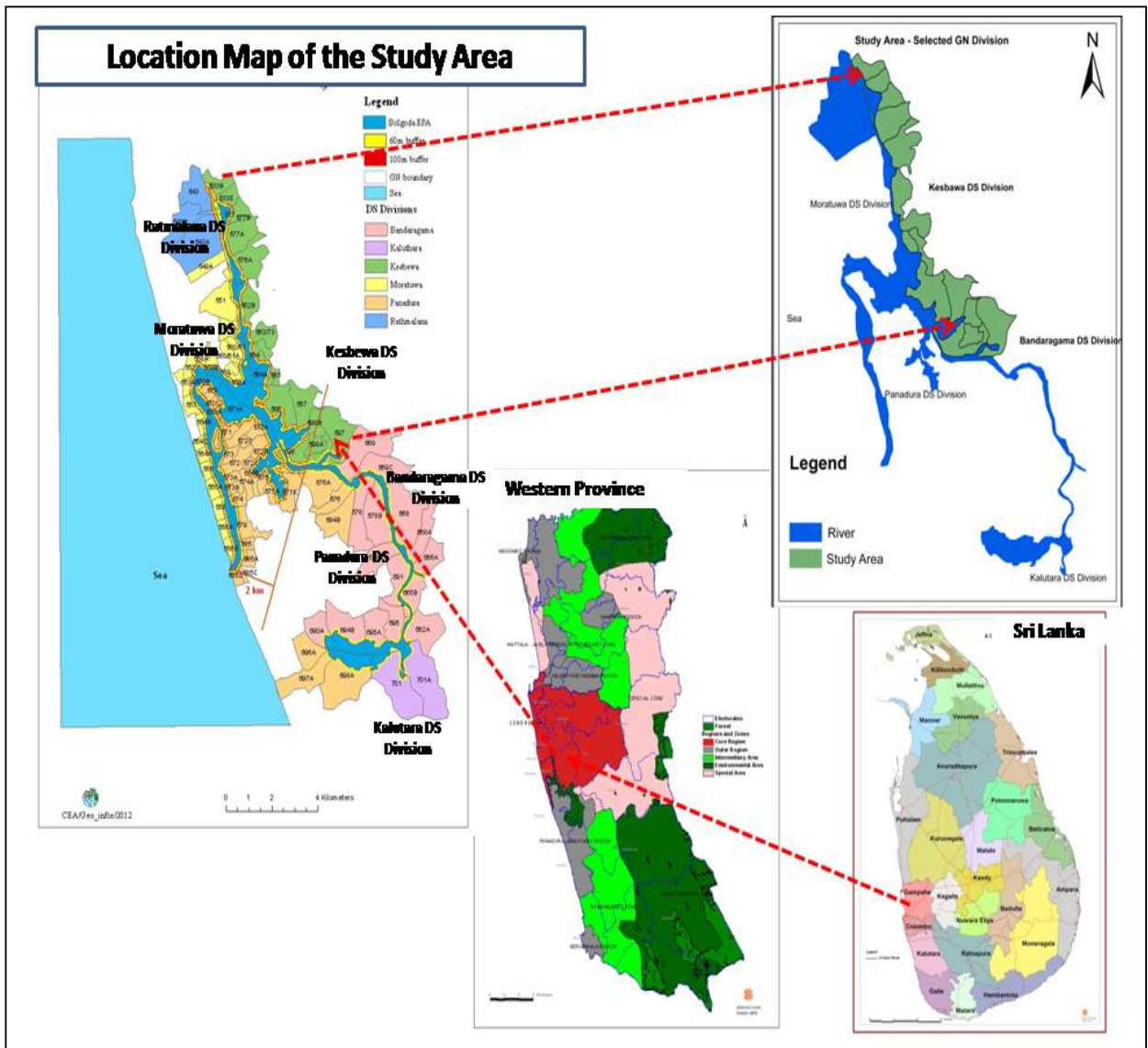


3.6 Selection of the Study Area

As per the development trend in Colombo District most of the developers made demand waterfront land for nature based developments aiming at residential use, tourist based developments and apartments. Residential use is directly involved in the concept of Geomortality rather than other type of use. According to the land use pattern, the residential use has become the major characteristics in the study area therefore, this area was selected for the study.

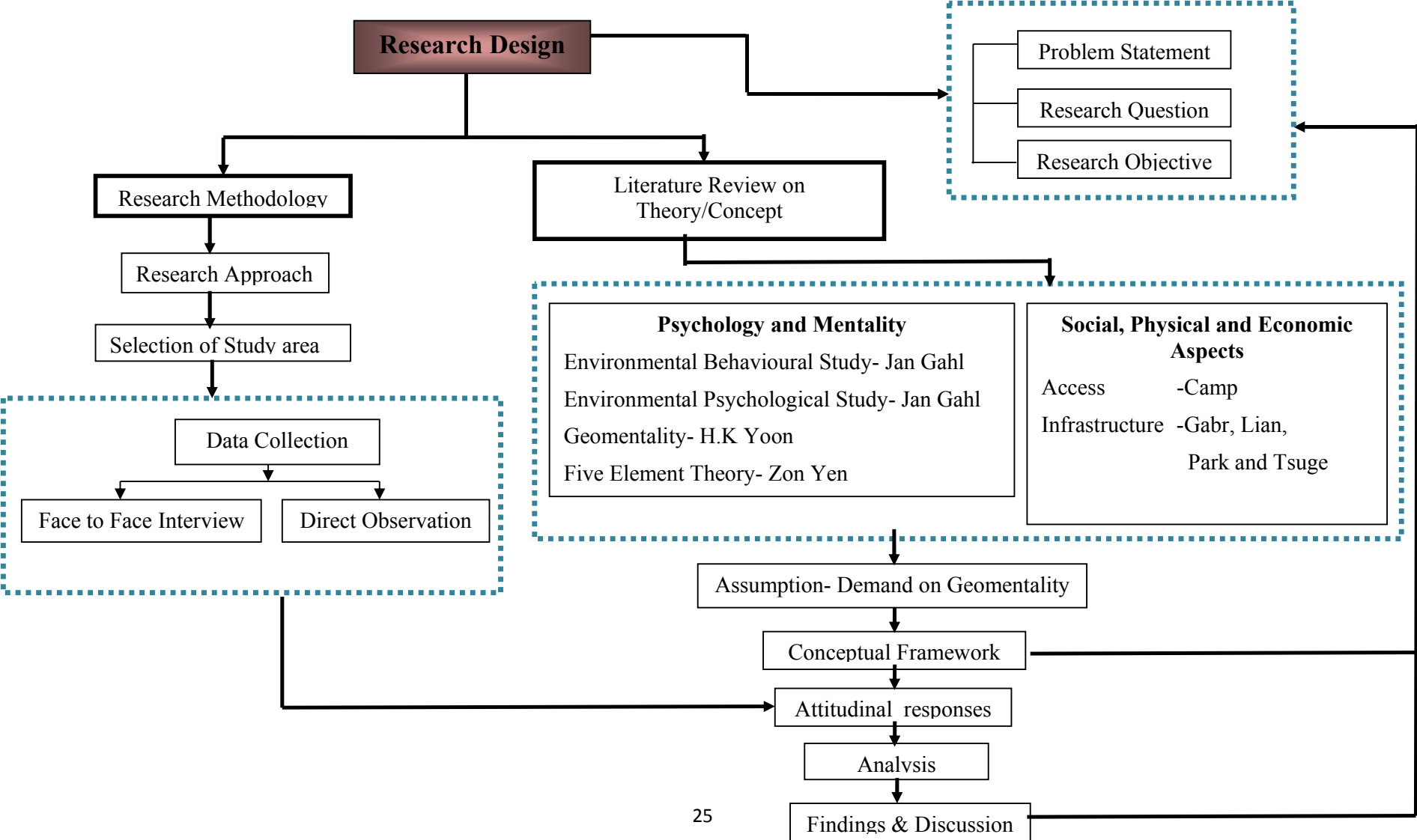
Bolgoda Lake waterfronts, Beire Lake Waterfronts, Diyawanna Oya Waterfronts, Kalani River Waterfronts, are the main waterfront areas in Colombo district. According to the development trend for the waterfront land, the residential development which is carried out based on waterfronts is the best for this study rather than other uses.

Figure 3.2: Location Map of the Study Area - Bolgoda Lake Waterfront



Source: Author, 2015

Figure 3.3: Research Design



3.7 Sample Selection

The main body of data is collected using the on-site user opinions and direct observations. Randomly selected respondent interview method was applied. This method was selected due to the ease of obtaining survey sample, low cost and limited time schedule.

Face to face interview method was used to explore qualitative data from the conveniently selected sample of population. Sample size was 50 and selected respondents are living in waterfront homes in Bolgoda lake area. Among those respondents some are born and brought in their ancestral land and some respondents are new residents who had purchased waterfront land. Each person has been interviewed individually. Majority of the respondents expressed direct answers regarding the interest to waterfronts. The respondents belong to different disciplines. They were from public and private sector services, business field and engaged in self-employment.

3.8 Method of Analysis

The collected data was analyzed using different data analysis technique. For example, personal direct observation information was analyzed based on content analysis method, interview data was analyzed using Cluster analysis technique.

The cluster analysis technique was mainly used to analyze the data in this study. The cluster analysis technique is a statistical method that enables to group a set of variables in such a way that variables in the same group and it is done based on characteristics they possess. It is a main task of exploratory data mining used in many field including pattern recognition, image analysis, bioinformatics and data compression. This technique also seeks to discover the number and composition of the groups.

3.9 Conclusion

The data was collected from direct observation and face to face interview method. Author used combination data analysis technique to analyze the collected data on emerging interest to waterfronts. Content analysis method, Cluster analysis technique were used to conduct the analysis.

The overall framework is used in chapter four to investigate the demand attributes for waterfront developments with the concept of Geomentality of waterfront residents in the study area.

CHAPTER 4

FINDINGS&DISCUSSION

4.1 Introduction

This chapter focused to present the results and findings of the study area in perspective of respondents and observations. Findings of the interviews and the observations of waterfront developments in the study area and key attributes affected for its demand were described in this chapter.

4.2 Current Waterfront Developments in City of Colombo

Real estate investment has been increased after ending of the war and its demand for the waterfront land has been focused. It can be seen when consider the following investments.

At present, numbers of apartment projects are ranging from standard to luxury levels in and around Colombo. The demand for luxury and semi-luxury apartments mainly come from high income social groups on motive the purchase units. Hence, the gradual increase in apartment capacity would meet the growing demand for apartments in line with the maturing city.

Table 4.1: Ongoing and Future Waterfront Development Projects in the City of Colombo

Project Name	Location	Room Price per Sq.Ft	
		City view	Water view
Crown Mixed Development Project	Bordering D. R. Wijewardena Mw (Beira Lake waterfront)	200 USD	250 USD
JKH Mixed Development Project	Slave island (Sea Front)	250 USD	300USD
Hyatt Regency Colombo Project	Galle face, Colombo-3 (Sea Front)	300USD	350USD

Eon Resorts Development Project	D.R. Wijewardena Mw (Beira Lake waterfront)	200USD	250USD
Altair Luxury Residence	Sir James Peiris Mw (Beira Lake waterfront)	250USD	400USD
The Density Mall & Residency	Slave island (Sea Front)	325USD	350USD
Shangri-La Hotel, Colombo	Galle face green (Sea front)	400USD	450USD
Marino Sands Hotel	From Galle road to Marian Drive (Sea Front)	400USD	500USD
ITC Hotel Colombo	Galle face Green (Sea Front)	425USD	500USD
Colombo City Centre	Sir James Peiris Mw (Beira Lake waterfront)	300USD	350USD

Source: TKS Securities (Pvt) Ltd, 2014

The most of housing units of waterfront luxury apartments in Colombo have been divided into two categories based on their view called city view and sea or lake view. Accordingly, value of the housing unit has also been changed. For Example, unit value of lake view in Diyawanna Oya luxury apartment is higher from five Million Rupees than the value of city view housing unit.

Table 4.2: Unit Values according to the View

Apartment Name	City View (Unit Value)	Lake View (Unit Value)
Fair Way Luxury Apartment - 2007	32Mn	37mn
Fair Mount Luxury Apartment - 2011	38Mn	42Mn
Fair Way Royal Garden - 2014	40Mn	45Mn

Source: Fair Way Holding (Pvt) Ltd.

Figure 4.1: Waterfront Developments around Diyawanna Lake



Source: Fair Way Holding (pvt) Ltd.

4.3 Bolgoda Waterfront area

The selected waterfront developments in Bolgodalake is located within Kesbawa Urban Council limits in the Colombo district of Sri Lanka and about 21 Km away from the City of Colombo to the direction of south east. This waterfront belongs to Nine Gramaniladari divisions namely, Madapatha, Polhena, Regidailwatta, Jaburaliya, Dalthara West, Dhampe, Wewala East, Thumbowila, Wawala West. The current population of the area is about 27,753 and average annual population growth is 1.15 percent. The distribution pattern of the population reviews that population is concentrated for few urban pockets in the area. Namely, Dampe. Wewala. Currently the area consisted of adequate good housing and the density of housing is 10 houses per hectare.

Table 4.3 Character of Kesbawa Urban area and Bolgoda Lake at different periods of time

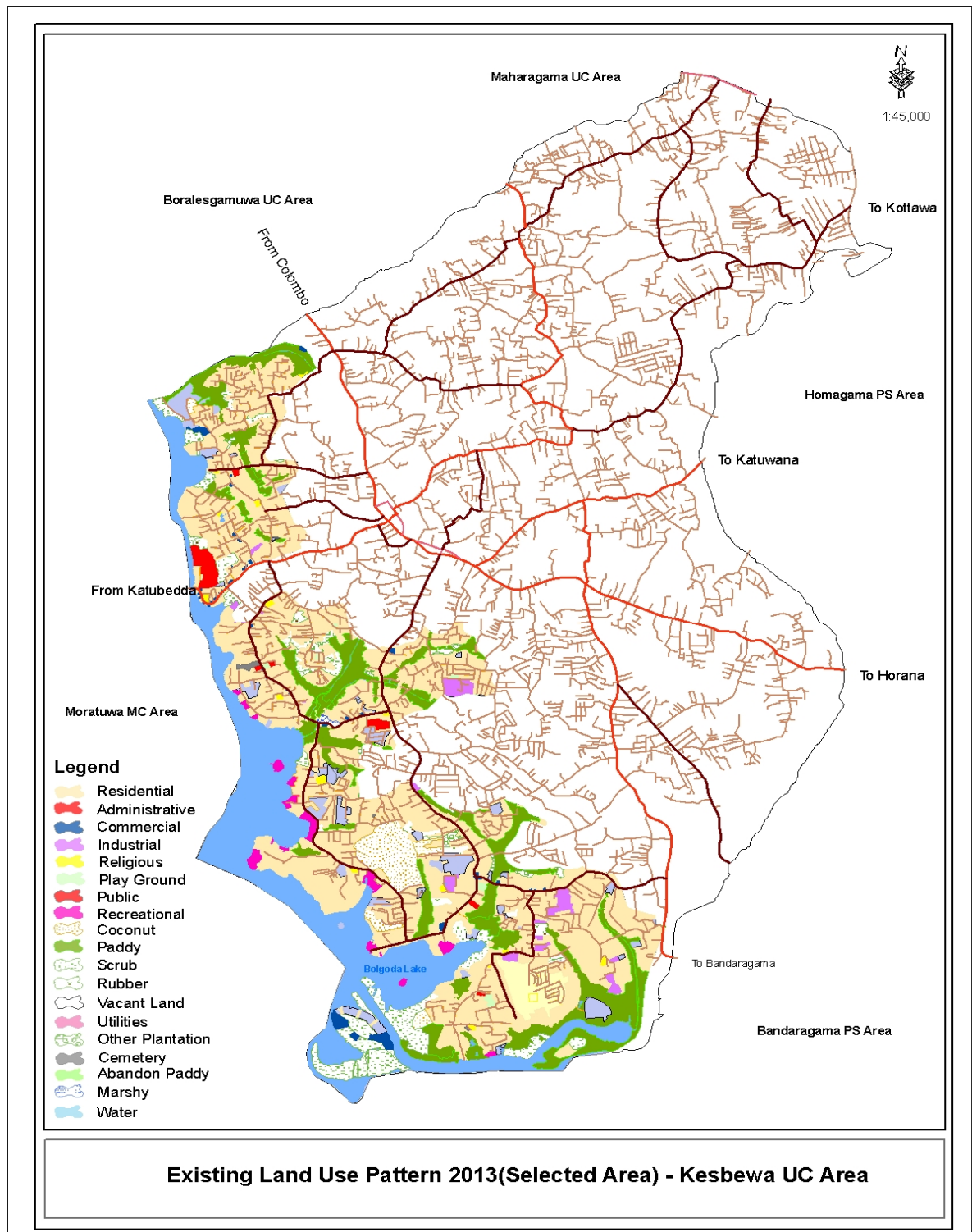
Time	Character of Kasbewa Urban Area	Function of Bolgoda Lake
1900 -1950	Forest and Agricultural base	Forest belt
1950 -2000	Agricultural base	Agriculture and local fishing belt
21 st Century	Economic and Service center	Tourism, landscape, Residential belt

Source :KesbawaDeveopment Plan, Urban Development Authority, 2010

The riverbank of Kesbava urban council limits was covered for the study, comprising an area of about 5 km in length. Houses, restaurants, Promenades, parks and other public open spaces that are physically linked to Bolgoda waterfront are included.

According to the developments that are taking place along the riverbank, the selected study area covers majority of the residential developments. The selected study area is also the most diverse and unique part of area, covering major riverfront sites in Kesbawa Urban Council limits. Famous tourist spots, as well as commercial and recreational spaces are found within the current study area. This area is becoming a point of interest for both local residents and non-local visitors.

Figure 4.2: Land Use pattern in the Study Area



Source: Kesbewa Development Plan, Urban Development Authority, 2010

Although the existing infrastructure facilities in the area are in poor condition, existing demand for the waterfronts is increasing day by day doing considerable effect for the area. It can be observed through the following table and figures. The road network in the area is not in good condition, most of roads are narrow in which about 10 feet-15feet wide maintained by the urban council of Kesbawa

Figure 4.3: Existing Access Roads



In most areas, the drains are either not available or not maintained properly. The area is not covered with sewerage system whereas community uses individual systems. Regarding waste disposal, the total waste generation of the area is about 02 MT and only 10 percent is recycled. The balance is disposed to an open ground at Karadiyana in unsustainable manner. The water supply is limited to certain concentrated area where the rest using well water, however, there are no complaints on water supply.

Figure 4.4: Changing of Build form

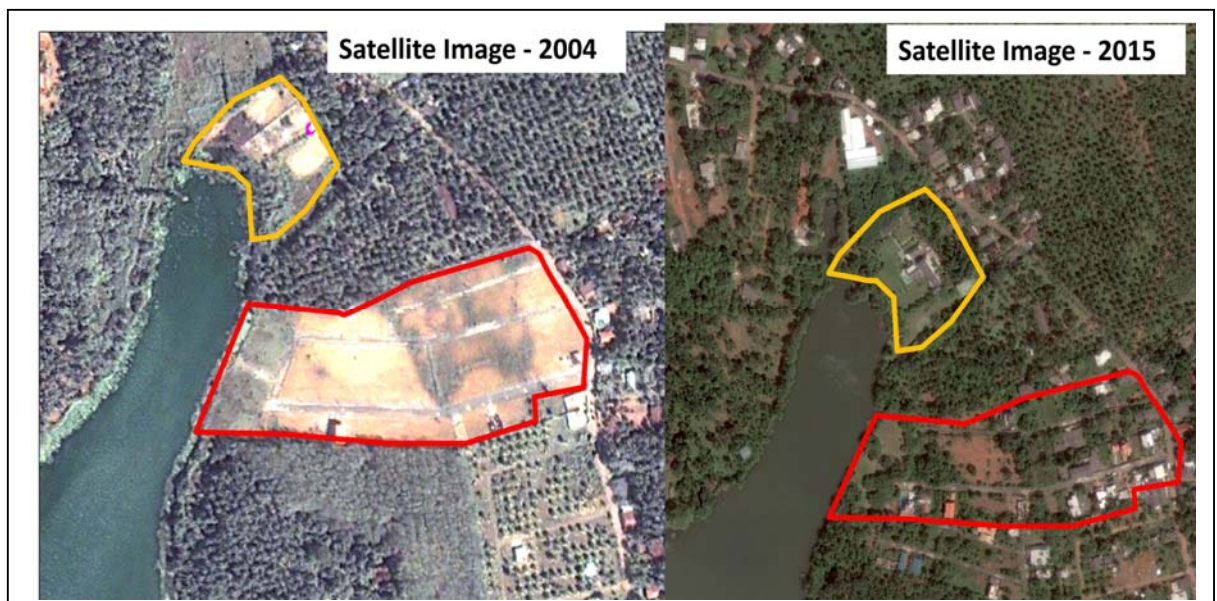






Figure 4.5: Conversion of Area



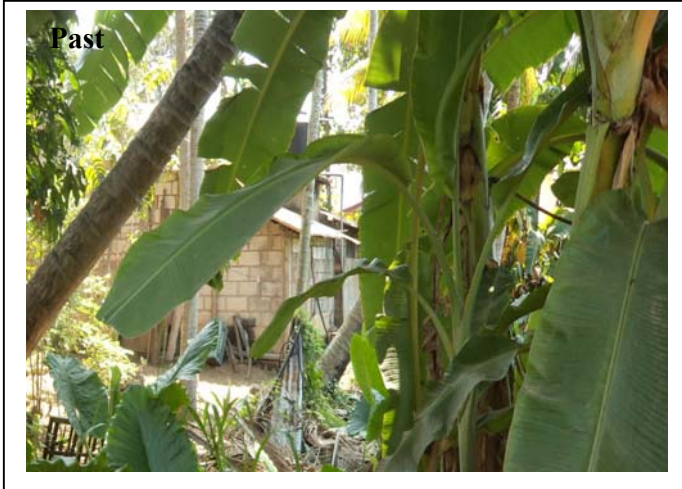


Figure 4.6: Encroachments and Unauthorized land fillings





Due to the demand pressure for waterfronts, the changing of land ownership, change of the build form and changing of the social group along the Bolgoda river front have been taken place rapidly. This situation can be observed through the following table 4.4. As a result of this demand pressure, low income social group attempts to sell their waterfront land for high price. Along with the change of the land ownership, the old single storied buildings were demolished and 2-3 storied new buildings are being appeared along the riverfront. From the comparison of satellite images along with land use adjustments; it can be observed easily that the urban fabric has been dramatically changed for the redevelopment. For example end of the Gagaasabada Road, Many parcels of small land were amalgamated into large land parcel.

More encroachments were taken place along the riverfront. Land owners attempt to increase their land extent due to the high demand. This situation has been increased due to the non availability of public access to the riverfront.

Table 4.4: Changing of Land Ownership, Build form and Social group, 2005-2015.

PAST				PRESENT			
Ownership	Land Extent	Floor Area	No Of Floors	Ownership	Land Extent	Floor Area	No of Floors
K.P A .Sirisena	34P	856 Sq.ft	01	P. Abesinghe	34P	3200 Sq.ft	02
P. Kusumawathi	28P	740 Sq.ft	01	H.K Ekenayeka	28P	2800 Sq.ft	03
A. Shyman Shichno	24P	600 Sq.ft	01	P. K Perera	31P	3100 Sq.ft	02
C.M. Galagedara	7P	-	-				
M. Sugathapala	48P	-	-	Ramani Perera	48P	4150 Sq.ft	03
H.K Ranasinghe	23P	1200Sq.ft	02	L. M Ramanayeka	23P	2900 Sq.ft	02
S. M. Rudrigo	38P	-	-	S. N. Rudrigo	38P	2800 Sq.ft	02
S. Siriyalatha	14P	950 Sq.ft	01	S.S. Senanayeka	14P	3050 Sq.ft	02
H.H. Peries	25P	1100 Sqft	01	H. H. Peries	25P	2400 Sq.ft	02
G. Rupasiri	21P	740 Sq.ft	01	M. W. Fernando	41P	3550 Sq.ft	02
K. Rupasiri	20P	-	-				
S. L. Egodage	1R. 22P	-	-	P. L. Karunarathne	1R. 22P	12450 Sq.ft	03
Ramani Perera	21P	1400Sq.ft	01	A.RuwanSampath	21P	2400Sq.ft	01
P. M. Hemalatha	16P	870 Sq.ft	01	K.M, Alwis	16P	2900 Sq.ft	02

Source: Keskawa Urban council 2005 - 2015

Although, several regulatory bodies have published specific regulations to protect the Bolgoda sensitive area, it was unable to protect the sensitivity of the area due to the demand pressure for waterfront land. It can be observed through the above figures.

Special regulations for the land sub division and building construction in the Bolgoda river area have been enforced by Urban Development Authority, Central Environment Authority and Irrigation Department. For example, it is not allowed for any construction within first forty feet from the edge of river and minimum land extent should not less than twenty perches.

Bolgoda environmental protection area was published under the Gazette Notification No. 1634/23 of 30th December 2009 by Central Environment Authority.

Land value of the Bolgoda waterfront area is ranging from Rs. 500,000.00 to Rs. 700,000.00 per perch. When the value of second block is ranging from Rs. 200,000.00 to Rs 400,000.00.

Considering the above social, physical and environmental effect by the demand pressure, Bolgoda waterfront area was selected to the research study.

4.4 Profile of the Respondents

Table 4.5 indicates the demographic profile of the users of the waterfront in the study area. The information was collected through face to face interviews by the author. A group of 50 respondents who are users of Bolgoda waterfront area was interviewed and taken as a sample and convenient sampling method was applied to interview them.

The findings showed diverse variation of users across age, gender, marital status, occupation, education and income (Table 4.5). The diverse sample ensured the reliability of the research findings.

Table 4.5 Demographic data from the On-site interview

ID	Item	Code	Content	No.	Percent.
1	Age	1	25-34	14	28%
		2	35-44	16	32%
		3	45-54	6	12%
		4	55-64	9	18%
		5	>65	5	10%
2	Gender	1	Female	23	46%
		2	Male	27	54%
3	Marital State	1	Single	18	36%
		2	Married	32	64%
4	Occupation	1	Business	8	16%
		2	Full-time	30	60%

		3	Self-employed	2	4%
		4	Retired	10	20%
5	Education	1	Middle	6	12%
		2	High	14	28%
		3	University	13	26%
		4	Other	17	34%
6	Income (Monthly)	1	<40,000	2	4%
		2	40,000-60,000	6	12%
		3	60,000-80,000	19	38%
		4	80,000-100,000	13	26%
		5	>100,000	10	20%

Source: Author, 2015

The table 4.5 indicates that the sample group was used to interview based on their age, gender, marital state, occupation, education and income for more rationality of the responses regarding the investigation of research questions. Furthermore table indicates that the male and female are living in waterfront homes in somewhat equal in number. It also indicates that most of the people 60% who are living in the waterfront homes belonged to pre-middle age category (25age - 44age)while 40% from the population are from middle age and adults category. Moreover 64% of the people in waterfront homes are married. Also 80% of the total respondents living in waterfront homes are employed in public, private sector or engaged in business or self employment. When considering about the education level, 54% have gained high education and university level education and only 12% of the people have studied up to middle level of education. 98% of the total respondents are receiving a monthly income above Rs. 40,000.00.

4.5 Attitudinal Responses

The following table indicates the attitudinal responses of the user respondents regarding their demand for waterfronts. This information was collected through face to face interviews by the author based on randomly selected respondents.

Table 4.6: Responses related to the demand for waterfront properties

User (Incentive responses (n=50))		
Better Scenery	40	80%
Cool Environment	48	96%
Relaxing	48	96%
Quite and Calmness	44	88%
Pleasant	36	72%
Everlasting Space	30	60%
Place for recreation	20	40%
Better greening	16	32%
Access for Water sport	4	8%
Distance for working place	4	8%
Social Prestige	8	16%
Dust free Environment	12	24%
Resale Purpose	12	24%
Fresh Air	40	80%
Bird Watching	12	24%
For Fisheries	2	4%
For Fishing (Entertainment)	4	8%
Watching Bio Diversity	16	32%
Reed cultivation	2	4%
For Art & Creation	8	16%
For Health condition	16	32%

Source: By the Author, 2015

According to the above attributes and its values, following table can be developed to identify the most common factors which caused to increase the demand for waterfronts.

Table 4.6.1 Ranking of the Responses according to its Values

Value = 96%	Value = 88%	Value = 80%	Value = 72%	Value = 60%	Value = 40%	Value = 32%	Value = 24%	Value = 16%	Value = 8%	Value = 4%
-Cool environment -Relaxing	-Quite & Calmness	-Better Scenery -Fresh Air	-Pleasant	-Everlasting space	-Place for recreation	-Better greening -Watching bio diversity -For Health condition	-Dust free environment -Bird watching -For fishing -For art & Creation	-Social prestige	-Access for water sports -Distance for working place -Resale purpose	-For fisheries -Reed cultivation

Source: By Author, 2015

According to the above table 4.6.1, 96% out of the total respondents have given first priority for Cool environment and Relaxing. 88% of respondents have given second priority for Quiet and Calmness while 80% of respondents have considered Better scenery and Fresh air. Some respondents have bought waterfront properties based on Everlasting space and Recreational purpose. These percentages are 60% and 40% respectively. Among the attributes, a range in 96% to 24% is related to environmental and recreational characteristics and a range in 8% to 4% is reflected economic based characteristics.

Table 4.6.2 Clustering of Different Responses based on its Characteristics

Cluster Distribution

	N	% of Combined	% of Total
Cluster 1	11	52.4%	52.4%
2	5	23.8%	23.8%
3	5	23.8%	23.8%
Combined	21	100.0%	100.0%
Total	21		100.0%

Perception

	Environment = 1		Recreation = 2		Economic = 3		Business = 3	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Cluster 1	11	100.0%	0	.0%	0	.0%	0	.0%
2	0	.0%	5	100.0%	0	.0%	0	.0%
3	0	.0%	0	.0%	4	100.0%	1	100.0%
Combined	11	100.0%	5	100.0%	4	100.0%	1	100.0%

Source: By Author, 2015

According to the above cluster analysis it is cleared that there are three distinct clusters. The first cluster seems to be the most powerful as it gathered more responses which are eleven responses out of total responses. Accordingly, it is noticed that all attributes gathered in it are psychological and attitudinal constructions in individuals towards certain geographical features. Accordingly, based on constituents, cluster one can be titled as “**Attitude based Responses**”

The second cluster is constituted of responses related to certain activities or functions based on that, it can be titled as “**Use based Responses**”

The third cluster is constituted of responses related to certain employments and tasks. Based on that, this cluster can be title as “**Employment based Responses**”

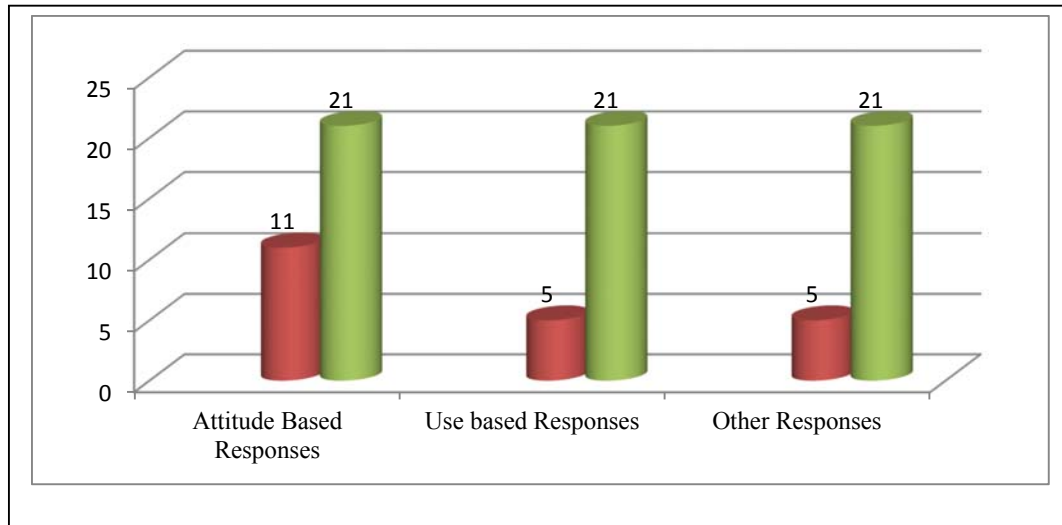
Finally, three distinct clusters can be listed as follows.

Table 4.6.3 Three Clusters and its Attributes

Cluster One	Cluster Two	Cluster Three
Attitude based Responses	Use based Responses	Employment based Responses
Better Scenery Cool Environment Relaxing Quite & Calmness Pleasant Everlasting Space Better Greening Dust free Environment Fresh Air Social Prestige For Health Condition	Place for Recreational Bird Watching For Fishing(Entertainment) Watching Bio Diversity For Art & Creations	Access for Water Sport Distance for Working place For Fishing activities Reed Cultivation Resale Purpose
Total =11	Total =05	Total =05

Source: By Author, 2015

Figure 4.7: Three type of Clusters



Source: By the Author, 2015

According to the above figure 4.7, main three clusters namely, cluster one is **Attitude based Responses**, cluster two is **Use based Responses** and cluster three is **Employment based Responses** indicate their values. According to the cluster one and cluster two, majority of the demand attributes are represented attitude based and use based characteristics. That amount is 52.4%. and 23.8% respectively. The percentage of cluster three titled as **Employment based Responses** is 23.8%. and that cluster has been created including various employments in it.

According to the comments given at the interviews, some respondents have bought waterfront land with the aiming of economic and business purposes. For example, some respondents have bought waterfront land as an access for water sports and closeness to their working places. Some respondents are living by cultivating Keer and engaging in fishing activities. Some respondents have bought waterfront land for resale purposes. They invest the capital as an investment opportunity since they have targeted to re-sale the waterfront land with a considerable profit margin within short period of time.

Following table 4.7 was developed to identify the Geomentality based attributes cause to the waterfront demand.

Table 4.7: Comparison of the demand attributes with Geomentality Characteristics (Characteristics extracted: By Maori Mind, Maori Land,1986)

Cluster Name	Demand Attributes	As an established & lasting frame in mind regarding environment	Systematically organized part of environmental perception	Pattern of thinking regarding living environment	Fixed view in dealing with environment	Integral part of individual or group dealing with land	Pattern of human behavior is the outcome of a certain mentality	Associated level with Geomentality
Attitude Based Responses	Better Scenery	✓	✓	✓	✓	✓	✓	Totally Agree
	Cool Environment	✓	✓	✓	✓	✓	✓	Totally Agree
	Relaxing	✓	✓	✓	✓	✓	✓	Totally Agree
	Quite and Calmness	✓	✓	✓	✓	✓	✓	Totally Agree
	Pleasant	✓	✓	✓	✓	✓	✓	Totally Agree
	Everlasting Space	✓	✓	✓	✓	✓	✓	Totally Agree
	For Meditation & Yoga	✓	✓	✓	✓	✓	✓	Totally Agree
	Better greening	✓	✓	✓	✓	✓	✓	Totally Agree
	Fresh Air	✓	✓	✓	✓	✓	✓	Totally Agree
	Social prestige	✓	✓	✓	✓	✓	✓	Totally Agree
Dust free Environment	✓	✓	✓	✓	✓	✓	Totally Agree	
Use Based Responses	Bird Watching	✓	✓	✓	✓	✗	✓	Agree
	For Fishing (Entertainment)	✓	✓	✓	✓	✗	✓	Agree
	Watching Bio Diversity	✓	✓	✓	✓	✗	✓	Agree
	For Art & Creation	✓	✓	✓	✓	✗	✓	Agree
	Place for recreation	✓	✓	✓	✓	✗	✓	Agree
Employment based Responses	Access for water sport	✗	✗	✗	✗	✗	✗	Not Agree
	Distances for working place	✗	✗	✗	✗	✗	✗	Not Agree
	For Fishing activities	✗	✗	✗	✗	✗	✗	Not Agree
	Reed Cultivation	✗	✗	✗	✗	✗	✗	Not Agree
	Resale Purpose	✗	✗	✗	✗	✗	✗	Not Agree

Source: Author, 2015 (✓-Match, ✗- Do not Match)

According to the above table 4.7 which indicates the comparison of different responses with the Geomentality characteristics, the demand attributes related to the Attitude based responses are reflected the Geomentality characteristics mostly. These attributes are Better scenery, Cool environment, Relaxing, Quite & Calmness, Pleasant, Everlasting space, Health condition, Better Greening, Fresh Air, Dust free Environment. The second cluster is presenting Use based responses including attributes such as Bird Watching, Fishing, Watching Bio Diversity, Art & Creation and Place for recreations are not directly reflected Geomentality characteristics. Accordingly, majority of the attributes are related to the Geomentality characteristics. As per the above analysis, the main causative factor behind the demand for waterfronts is the Geomentality. But few of various other attributes have also caused to demand for waterfronts.

When observe the following tables 4.8 and 4.8.1, it indicates income range and people responses related to Geomentality characteristics. The responses which are reflected Geomentality characteristics such as Better scenery, Cool environment, Relaxing, Quite and Calmness have become the priority. The respondents in income ranges of Rs.80,000 – Rs.100,000 and over Rs. 100,000 have almost expressed equal responses related to the demand for waterfronts. Employment based responses have derived from the low income social group who are below the Rs.60,000.00 monthly income. These responses did not reflect Geomentality characteristics.

Accordingly, it can be expressed that the demand for waterfront developments creates from the high income social groups based on the concept of Geomentality.

Table 4.8: Income Levels

Cluster (Income Range)	<40000 =1		40000-60000 = 1		60000-80000 = 3		80000-100000 = 2		>100000 = 4	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
1	2	100.0%	6	100.0%	0	.0%	0	.0%	0	.0%
2	0	.0%	0	.0%	0	.0%	13	100.0%	0	.0%
3	0	.0%	0	.0%	19	100.0%	0	.0%	0	.0%
4	0	.0%	0	.0%	0	.0%	0	.0%	10	100.0%
Combined	2	100.0%	6	100.0%	19	100.0%	13	100.0%	10	100.0%

Table 4.8.1: Relationship between Income level and Demand Attributes

Income category	Demand Attributes																				
	Better Scenery	Coolest Environment	Relaxing	Quiet & Calmness	Pleasant	Everlasting Space	For Recreational	Better Greening	Social Prestige	Dust free Environment	Fresh Air	Bird Watching	For Fishing (Entertainment)	Watching Biodiversity	For Art & Creation	For health Condition	Access for water sports	Distance for working place	Resale purpose	For Fishing	Reed cultivation
<40,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
40,000-60,000	5	6	6	3	3	1	-	-	-	-	3	-	-	-	-	-	-	2	7	-	-
60,000-80,000	12	19	19	18	10	9	1	-	-	1	18	-	-	-	3	-	1	2	5	-	-
80,000-100,000	13	13	13	13	13	10	9	6	2	1	10	4	4	7	5	11	-	-	-	-	-
>100,000	10	10	10	10	10	10	10	10	6	10	9	8	-	9	-	5	3	-	-	-	-
Total (N=50)	40	48	48	44	36	30	20	16	8	12	40	12	4	16	8	16	4	4	12	2	2

4.6 Used variables to investigate the Geomentalty of the Respondents

According to the book entitled “Maori mind, Maori Land” written by H.K Yoon in 1986, it was explained Geomentality of the Maori people and their land. The characteristics of the Geomentality explained in it are as follows. “The land is the original mother who gives birth and sustain life, Emotional and spiritual ties with their land, Land is treated as living entity and finally alienation of the land was referred to as the death of the land.” Accordingly based on these characteristics, following questions were used to investigate the Geomentality of the respondents of the study area considering following variables. The variables which were used, indicated in the table 4.9

The variables used are, existing other houses and desire to live in it, desire to resale the property, desire to rent out the property and desire to change of the use. Accordingly, following tables and pie chart prepared using by MS Excel to describe the relationship between Geomentality and true need of the user.

Table 4. 9: Variables used to investigate the Geomentality of the Respondents

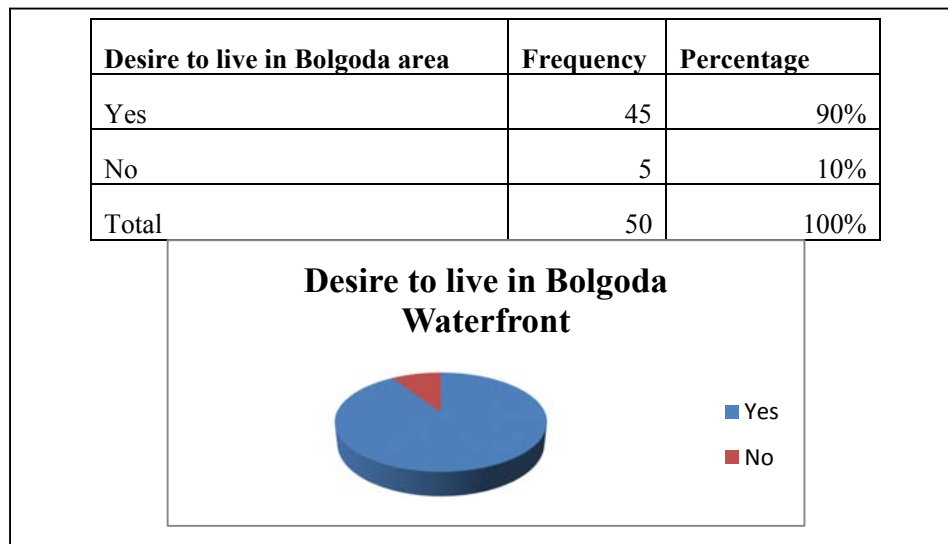
Variable	Geomentality Based	Non-Geomentality Based
1.Desire to live in Bolgoda waterfront even though they have additional homes in other area	Yes	No
2.Desire to resale the property	No	Yes
3.Desire to rent out or change of the use	No	Yes

Source: Author, 2015

4.6.1 Variable – 1, Desire to live in Bolgoda waterfront even though they have additional homes in other area.

The following figure (figure 4.8) indicates how the preference to live in waterfront homes change when they own an additional home in non-waterfront area. According to the interview, 11 respondents owned additional homes, but 10 respondents out of the 11 respondents live in Bogoda waterfront homes because of their personal interest for Bolgoda waterfront. When convert this into a percentage value this can be indicated as, 90% of respective population preferred to live in waterfront homes and only a 10% preferred to live in their additional homes located in outside. Accordingly, it is revealed that they are more interested in living in waterfront homes due to Geomentality. It was also revealed that the income level also has an effect with the Geomentality, because one common character found in this group was that their monthly income level was more than Rs.100,000.00.

Figure 4.8 Desire to live in Bolgoda waterfront

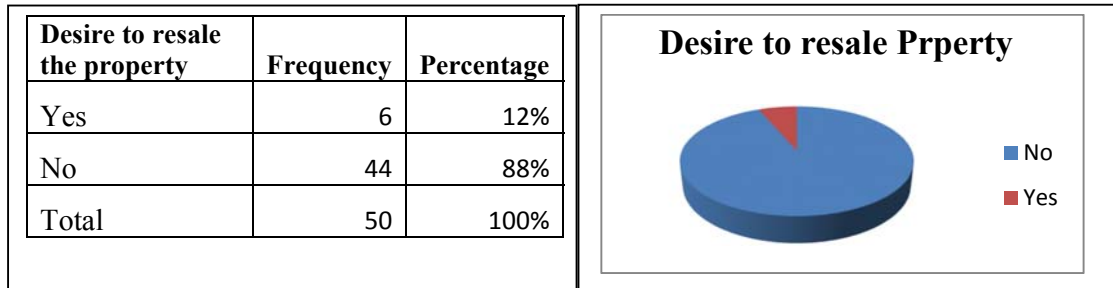


4.6.2 Variable -2, Desire to resale the property

The following figure indicates that the majority of the respondents do not like to resale their properties at the higher price too. Most of the owners have obtained their

properties by purchasing. Only 12% out of the total respondents prefer to resale their properties. Accordingly, it was revealed that they are very interested in their waterfront homes due to the Geomentality.

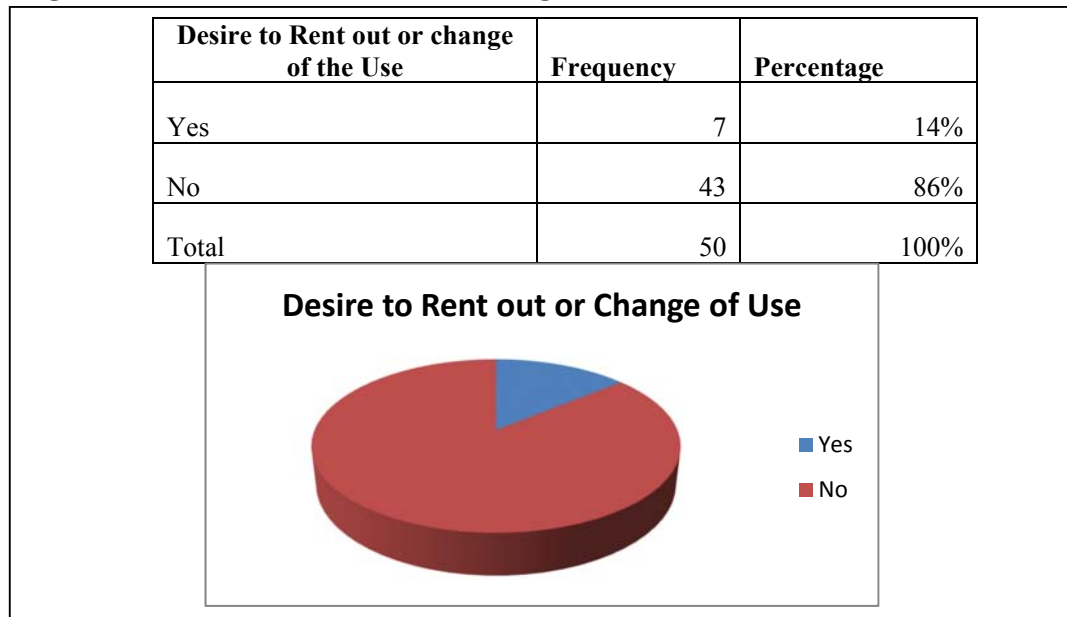
Figure 4.9: Desire to Resale the Property.



4.6.3 Variable – 3, Desire to Rent out or Change of Use

The results indicated in the following figure 4.10 shows, only 14% of respondents like to rent out or change the use of their homes. But 86% out of the total respondents do not like to rent out or change the use of their homes. This is a clear example to prove that the Geomentality is the causative factor behind the increasing demand for waterfront properties.

Figure .4.10: Desire to Rent out or Change of Use



The analysis of these three variables proved that the majority of the respondents are in allegiance to the waterfront living due to the Geomentality.

4.7 Comparison of Geomentality characteristics with true needs of the respondents

In this study, it was revealed that the interest for waterfront homes is based on mainly Geomentality. But various other attributes are also affected to create the demand for waterfront developments. As reflected in the Geomentality characteristics of the respondents, they are intense and certain ties with their land. Majority of the respondents do not like to resale, rent out or change the use. Although they have additional homes in other area they are still living in waterfront homes in Bolgada area. According to the interview, The Geomentality characteristics reflected by the social group who are having over Rs.80,000.00 monthly income.

Bolgoda Lake is a prominent landmark. People use this waterfront lands to use for the recreational purpose with the living entity. The way that the people in waterfront homes identifying themselves with the land, reveal their attitude and entertainment activities. People living in waterfront homes adopted whichever the name more prestigious in order to highlight their states. Landscape features have been a very popular theme in the attraction for the waterfront developments.

The behavior of the personified environmental elements in the demand for waterfront development is described or explained the characteristics of Geomentality or natural phenomena in human terms. Environmental ideas are reflected in the demand.

When study of waterfront home morphological changes, however, the analysis of the material aspects of the house along - such as size, shape, situation and internal design is completely in effect for the demand and socio-economic function. Secondly, material aspects of the waterfront homes are often only a partial representation of the market mechanism.

Even though Geomentality is the main reason for demanding waterfronts, the relationship between material aspects (the physical appearances) and non-material aspects (Geomentality characteristics) of a waterfront developments be compared.

The following three important aspects, namely attitudes, social function and social level are mainly caused to promote the demand for waterfront development trend.

The Community gathering such as Weddings, birthday parties and office parties have been attracted around the waterfront places in Bolgda area. The physical form of the waterfront development along the Bolgoda river has changed more significantly since contacts with emerging demand for waterfront development trend. The physical appearance of waterfront developments along the Bolgoda river differs from other areas; residential developments can be appeared than the other uses.

Figure 4.11: Waterfront Homes in Bolgoda Area



Source: Author, 2015

Social characteristics of the urban population are important determinants of the demand for the waterfront land and its services. The underlying population trends will influence future demand for waterfront land in Bolgoda river area in various ways and degree.

4.8 Findings of the Study

- All of the identified demand attributes in relation to Attitude based responses mostly reflect Geomentality characteristics. Those attributes represent the majority of demand attributes. Accordingly, Geomentality is the causative factors behind the increasing demand for waterfronts.

- But various other factors in relation to the Economic and Business aspects are also affected to demand for waterfronts. For examples, waterfront lands are

used as an access for water sports, Keera cultivation and fisheries and this attributes do not reflect Geomentality characteristics.

- According to the analysis, Geomentality characteristics are reflected by the high income social groups.
- Three important aspects namely attitudes, social functions and social level mainly caused to promote the demand for waterfront.
- The deeper reason behind the emerging interest for waterfront is not the true need. Accordingly, issues related to the communication gaps is the lack of awareness and knowledge base.

4.9 Conclusion

Based on findings and discussion, it is concluded that emerging demand for waterfront developments in considering the Bolgoda lake waterfront area, the majority of the attributes related to the attitude based responses prior to the increasing demand are illustrated the Geomentality characteristics. But non-Geomentality attributes related to the Economic and Business aspects are also affected to the waterfront demand. But these attributes do not reflected Geomentality characteristics. On the other hand, Geomentality based demand attributes are reflected from high income social groups. As the reflection of Geomentality characteristics of the respondents, they are intense and certain ties with their land and majority of the respondents do not like to resale, rent out or change the use of their waterfront homes. Finally, three important aspects, namely attitudes, social functions and social level are mainly caused to promote the demand for waterfront developments.

CHAPTER 5

CONCLUSION

Urban waterfront play a significant role for the developments of an urban area which is giving many values in the point of view of flood management, ecological and environmental balance and control of urban heat. Due to market potential, demand for the waterfront developments is increasing day by day. Therefore changing of the natural setting is also taken place giving negative effect for the environment.

Even though demand for waterfront land is increasing day by day, there are not proper planning approach and prerequisite demand mechanism are established. Therefore, what is needed to develop a knowledge base for the awareness. Many projects have been launched spending enormous resources to recover the damage of waterfront environment by relocating and renovating of existing build-up environment from time to time. Nevertheless, their results were failed to prevent those waterfront environment and existing regulatory measures, are not sufficient to prevent the negative effect forced on waterfront environment. The reason for that is lack of awareness and knowledge base in our society.

In the psychological analysis, the concept of Geomentality explains the reason for demand for waterfronts. Geomentality is defined as a systematically organized part in the mind regarding environmental perception. According to the above analysis in chapter four it was revealed that the majority of the attributes related to the attitude based responses caused to the demand are reflected Geomentality characteristics and those attributes are cool environment, scenery, relaxing, calmness, greenery and everlasting space gained from the water body and these are prior to the demand. Non-Geomentality attributes related to the Economic and Business aspect are also caused to the waterfront demand, for examples, some respondents use waterfront land as an access to water sports and some respondents use waterfront land for Keera cultivation and fisheries. But these attributes do not reflect Geomentality Characteristics.

Majority of the respondents do not like to resale, rent out or change the use of their property and some of the respondents are living in Bolgoda waterfront homes even

though they have additional homes in other area. It further revealed that the Geomentality characteristics are reflected by high income social groups.

As a whole, following major findings were founded through the study and it is possible to develop a knowledge base for awareness in relation to increasing demand for waterfront developments.

- All of the identified demand attributes in relation to attitude based responses mostly reflect Geomentality characteristics. Those attributes represent the majority of demand attributes. Accordingly Geomentality is the causative factors behind the increasing demand for waterfronts.
- But various other factors in relation to the Economic and Business aspects are also affected to demand for waterfronts. For examples, waterfront lands are used as an access for water sports, Keera cultivation and fisheries and these attributes do not reflect Geomentality characteristics.
- According to the analysis, Geomentality characteristics are reflected by high income social groups.
- Three important aspects namely attitudes, social functions and social level mainly caused to promote the demand for waterfront.
- The deeper reason behind the emerging interest for waterfront is not the true need. Accordingly issues relates to the communication gaps is the lack of awareness and knowledge base.

In addition to the above research findings, it would be important to carry out a comprehensive study for each attitude based responses, use based response and Employment based responses in detail and making observation of how each of those effect for increasing demand for waterfronts in Sri Lankan context, which was lacking in this exercise due to limitation of scope and the time of study. Such study can be generalized in order to develop a broad knowledge base for awareness regarding the increasing waterfront demand in urban areas. Awareness can be made by introducing

alternative solutions to attract the people instead of waterfront attraction. For example create urban forestry, parks, apply architectural designs, landscape designs and paintings for house environment. However, until then, above findings can be brought forward as an initial action for awareness about waterfront demand.

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