

Debreceni Egyetem
Műszaki Kar



**Revitalizing Urban Landscapes :
A Strategic approach to urban renewal of Beira Lake
East , Colombo, Sri Lanka**

**Authors(s) Ramawickrama Gamachchige Prabuddhika Sandamini
Urban Systems Engineering Msc student**

Supervisor(s): Dr. Lovra Éva
Head of department: Dr.Imre Kovács

Debrecen
2024.

1. Introduction

Urban renewal is used as a strategy to address rapid urbanization, environmental degradation and low quality of life in cities. By revitalizing degraded and underutilized urban areas, environmental conditions are improved, communities are strengthened, and economic opportunities are elevated. This urban renewal concept helps to balance the natural and social elements of a city with a growing urban population by creating sustainable, functional and aesthetically appealing spaces. As for the project, using waterfront urban areas for urban renewal offers more opportunities for addressing recreation, accessibility, resilience and restoration of a highly active commercial hub in Sri Lanka.

Despite being the capital of Sri Lanka, Colombo city is well known for its high dense city developments which have created a negative impact on the city. This affects the environmental, social and economic value of the city. Therefore, these issues have to be managed on a small or large scale to create a better living quality of life for people in cities. There have been many efforts to revitalize the area through different planning projects and yet the status of the city still remains the same. Through the project, Beira Lake, which is a landmark of the city where both greenery and dense development is evident was addressed. The neglected planning and maintenance which has led to several issues such as encroachment, biodiversity loss, heat island effects and overall decline of city image created an opportunity for a transformative urban renewal project which will enhance the quality of life and the surrounding environment.

The main purpose of the project is to develop an urban renewal design proposal for the Beira Lake – east area which responds to the community needs and ecological sustainability in order to create more resilient, accessible, vibrant and inclusive urban environment.

2. Definition of Urban Renewal

In the recent years, cities are facing critical issues such as urbanization, encroachment, increase in population and pollution. Renewal of urban areas is considered as one of the concepts to reduce such effects in given areas and improve the overall quality in cities. Urban renewal is regarded as an approach which increases land values and the environmental quality of cities. (Adams & Hastings, 2001). This concept is based on creating functional and tangible changes in city attributes as a response to urban design. (Couch, 1990). As a result of urban renewal, many urban

issues are resolved which results in a holistic improvement in urban conditions. Urban economic, social, physical and environmental conditions are uplifted as a long-term result of this approach. (Roberts and Sykes, 1999).

2.1.Importance of urban renewal

Urban renewal came into use during the early 20th century when urbanization brought many issues in cities which affected human living conditions. This addresses a period around 1950 where a massive national effort was put in place for removal of damaged structures and eradicating poverty from city cores which became a downtown preservation revitalization strategy. (Hyra, D.S, 2012) Urban renewal is a crucial strategy which can address many issues such as aging infrastructure, economic decline and environmental degradation. Urban renewal helps to improve the physical infrastructure of buildings in a city (Peng et al., 2015), also addresses environmental issues (Chan and Yung, 2004) and in turn tend to increase the land value of the city (Ho et al., 2012). Overall, the concept of urban renewal is about improving the socio economic, physical and environmental aspects of a city through various actions such as redevelopment, protection of heritage value and rehabilitation. (Zheng, W et al, 2014). This concept generates high quality of life and aesthetically improved functioning cities.

2.2.Key aspects of urban renewal

Urban renewal is composed of several aspects which come from several disciplines. Environmental restoration, public place renewal, economic redevelopment and community engagement are primary aspects under this concept. (Couch et al, 2003). These aspects are often interconnected to achieve the best outcomes in urban renewal.

Environmental restoration is one of the main components of urban renewal when it comes to ecological degradation. (Ehrenfeld,2000). Addressing pollution, enhancing biodiversity and integrating green infrastructure into development are the basic outcomes in restoration. (Holling, 1973). Revitalization and conservation of environments in urban settings not only contribute to environmental quality, but also to public health by reducing air pollution, reducing urban heat island and creating better quality cities. (Anguelovski, 2014). When it comes to the development of water bodies, bio filtration, wetland restoration and waste management are used to restore the water quality. (Chang et al, 2016).

Public space renewal is necessary to facilitate recreation and social interaction. (Whyte,1980). Public spaces are vital for urban areas as they have the ability to bring communities from different backgrounds together and create the city urban fabric more vibrant. (Jacobs, 1961). Well-designed public spaces increase the safety in cities and create more stronger neighborhoods. (Gehl, 2011). More so, underused areas can be converted to busy areas by adding elements such as seating, landscape design and pedestrian oriented designs. (Carmona et al, 2008).

Another main aspect which creates job opportunities and attracts investment into the city is the economic development through urban renewal. (Couch et al.,2011). Successful economic development integrates residential, commercial and recreational development which contribute to mixed use development of the cities. (Fainstein, 2001). Increased land value is also another outcome due to restoring underutilized areas in cities. (Zukin, 1995). Projects like Barcelona's El Raval are effective projects which follow the concept of adaptive reuse of historical buildings which has been very effective in creating culturally valuable urban spaces which attract people into the city improving economic growth. (Couch & Dennemann, 2000).

Community engagement ensures that local needs are addressed through urban renewal. (Arnstein, 1969). When projects involve local people , the rate of getting stakeholder support also increases due to stronger and long-term outcomes of the projects. (Forester, 1999). Community engagement is also important in multi-cultural settings as different groups share different opinions and visions for development locally. (Madanipour, 2010). Each of these aspects plays a major role in contributing to transformation of urban spaces through urban renewal.

3. Methodology

The main goal of the project is to use urban renewal as a base for an existing site in an urban setting in Colombo, Sri Lanka. As for the case study Beira Lake area in Colombo has been selected. Colombo is the commercial capital of Sri Lanka, a developing country in the South Asia. As a commercial hub, in Colombo the level of urbanization is very high which creates many urbanized challenges within the city. Colombo is identified as a primary urbanization area with a high population density in Sri Lanka. Thus, the number of physical elements in the city has increased over time.(Dahanayake & Wickramasinghe, 2022).

A site analysis was conducted with the information gathered from different sources such as research articles, news articles and digital tools such as Google maps were used to create design maps and plans for the project. Then the key issues of the area were highlighted in order to generate the proposed zoning plan and conceptual approach for the design. The conceptual design was then mapped out in a proposed design plan. The generated conceptualized design was visualized using the AI visualization tool Canva by entering the key design proposal data to produce more enhanced and visualized outputs of the design and it was not to replace the traditional design generation methods but more as a supportive tool to display the best outcome of the project. The potential benefits of the urban renewal project were highlighted for better clarity and further discussion of the project.

4. Site selection

4.1. Background and context

The commercial capital of Sri Lanka, Colombo consists of a mosaic of natural and man-made urban wetland systems. Each of them is interconnected and runs across the city of Colombo supporting ecosystem services needed for sustaining urban life. One of the lakes within this system is the Beira Lake, located at the heart of the Colombo city and spread across 65 hectares. Beira Lake comprises of four main sections: the East Lake (46.2 ha), the Galle Face Lake (2.7 ha), the West Lake (8.1 ha) and the South West Lake (11.4 ha). The lake is surrounded by commercial buildings, residential housing units, transportation networks and the overall area is highly



Figure 1 - Location of Colombo and Beira Lake
Source : Author



Figure 2 - Four lakes of the Beira Lake
Source : Author

urbanized, but the lake at the center creates a different relaxed setting for the busy life of the city. This lake area has been identified as an area with high potential for waterfront developments and urban regeneration projects. Thus, the government has put forward many plans and projects to uplift the lake surroundings. However, the currently the lake is used for many incompatible activities, and this has created unpleasant surroundings in some parts within the lake round.

4.2.History of the Beira Lake

The Portuguese built the lake in 1521 for the single purpose of protection of the city from invasions. They also used the place as a transportation channel across the city. Lake is said to be named after an engineer called De Beira. When the Dutch invaded Colombo, they flooded the lower lands away from the lake and expanded it further. And small islands were visible within the water body. Dutch used it for leisure and also for transportation across the city. When British took over the control of the Colombo Fort, they declared the lake to be one of the best attractions of the city. Therefore, they used the area for recreational activities and also used it for festivals and celebrations



Figure 1 - Beira Lake in the 20th Century (Source: <https://water.edu.lk/wp-content/uploads/2021/06/The-History-Of-The-Beira-Lake.pdf>)



Figure 2 - Painting of Beira Lake in ancient times (Source : <https://water.edu.lk/wp-content/uploads/2021/06/The-History-Of-The-Beira-Lake.pdf>)

Once Sri Lanka was liberated from the western invasions and gained independence, urbanization of the Colombo city took place rapidly. Thus, leading to development of the Beira Lake area into a highly dense built-up area. With time, industries began developing around the city. Changes in land use of the area affected the Beira Lake directly and indirectly. Lake encroachment, dumping waste and waste waters into the lake, enclosing the lake by buildings obstructing wind pathways, lake eutrophication are some of the impacts which took place during this period.

Rapid urbanization led to unplanned developments and illegal constructions around the city and even close to the lake perimeter. This led to the initiation of a number of master plans to control and properly develop the city. The Beira Lake area was considered as one of the main areas to be taken into consideration. The following are some of the plans which were proposed and executed to certain extents. (UDA, 2019)

1. City Plan by Sir Patrick Geddes – 1921
2. Plan by Clifford Holiday – 1940
3. The Regional Plan by Patrick Abercrombie – 1948
4. UNDP Assisted Colombo Master Plan – 1978
5. City of Colombo Development Plan – 1985
6. Colombo Metropolitan Regional Structure Plan (CMRSP) – 1998
7. City of Colombo Development Plan – 1999
8. Western Region Mega Polis Plan (CESMA) – 2004
9. City of Colombo Development Plan (Amendment) – 2008
10. Western Region Mega Polis Master Plan – 2030

All these plans included Beira Lake area but City of Colombo Development Plan of 2008 highlighted Lake area to be a special case for consideration. Beira Lake Master Plan 1993 listed Lake as the center development area for a master plan which identified 15 water-based sites in the Colombo city. The basis for this master plan was to convert Colombo city into a water-front city using the Beira Lake as a central attraction. Currently Western Region Mega Polis Master Plan 2030 is ongoing for a few selected areas around the Beira Lake site.

4.3.Current situation of the site

The deterioration of the lake from the 20th century has continued up to this date. In the current context, even though the lake is connected to the wetland water mosaic in Colombo, the flow of water across the lake depends mostly on runoff water. Therefore, the lake is mostly stagnant. Lake is not viewed as an aesthetically pleasing water body. But as a backyard for buildings and as a wastewater collector. Lake consists of large number of aquatic habitats. But due to pollution, most of the species are threatened and this damages the ecosystem. Even the communities living in the

area are affected by various health issues. The water contains toxic metal contaminants contributing to poor biological processes. Therefore, eutrophication is evident in most parts of the lake.



Figure 3 - Current condition of the Beira Lake

Source: <https://www.pressreader.com/>



Figure 4 – Pettah market

Source: <https://visitsrilanka.info/content/11-pettah>



Figure 5 - Streets in front of Pettah Source:

<https://robandjenny.co.uk/index.php/2019/03/18/and-were-off-first-stop-sri-lanka/>

Also, the presence of nearby train stations and bus stations facilitate large volumes of people and vehicles especially during the rush hour creating congestion. Lack of planned pedestrian ways contribute to improper navigation of users through the areas. The densely packed streets with buildings and alleyways generate unsafe spaces for pedestrians. Due to the highly dense urban fabric, lack of greenery and low maintenance affects the overall visual quality of the space. Even

the Pettah market, which is the busiest open market in Colombo cannot accommodate the flow of people due to its narrow streets and the roads are always packed with moving and parked vehicles. The level of air pollution and noise pollution is very high in this area creating very repulsive urban environments for the community.

Therefore, it is evident that the improper use of the site has led to the degradation of a significant city area. But a water body of this size could be used as a potential to rejuvenate the city image and functionality of the area by providing more direct connections of this ecological system to the city and the city user. And planning the site with proper pedestrianized pathways and regulating vehicle flow will help to manage the issues which are evident in the site currently.

5. Project formulation and design objectives

5.1. Project justification

In ancient times, civilizations were built close to rivers and water bodies, which points out how important water is as a resource for sustaining life. Back in the 20th century, the ecological systems and their influence over urban systems were minimal due to the lack of knowledge and practice. But in recent years, the ecological systems have been acknowledged as a factor which influences the quality of life especially in cities. Transformation and usage of water bodies to create sustainable, functional, and livable cities is seen all around the world. In the present era, water shapes the urban planning of metropolitan areas, cities, towns and rural areas. (EEA, 2016). Urbanization and increasing population of the cities have created critical environmental and social issues in cities. The case of Colombo city is no different.

With the rapid development of the Colombo city, the necessity to acknowledge the presence of Beira Lake is highly important. Even though previous proposals suggested to develop Colombo as a water front city, the focus has been mainly upon developing infrastructure and built environment. But the impact of increasing built areas; building, industries, houses, road networks and shopping complexes tend to create a gap between the human factor and the environmental factor. The eight to five lifestyle will affect the people of the city physically and mentally. Thus it is required to pay attention to the ecological systems that runs across the city and take proper use of it to address the negative impacts created through rapid urbanization.

The proposed project will focus on the Beira - East Lake as the main center for the project and combine the northern commercial area close to Pettah with it. Pettah is one of the busiest places in the city where a famous market area with diverse goods and items can be found. This place is active throughout the whole week. The number of people coming to this place is very high. Right below the pettah area is the main transportation hubs of Colombo. The Fort Railway Station and the Fort bus stand. The human and vehicular circulation along these routes is creating crowded and heavily congested surroundings in the city. Right below these hubs are the Beira Lake Bank which is enclosed with buildings and unauthorized construction. These three layers will be taken into account for the project proposal.

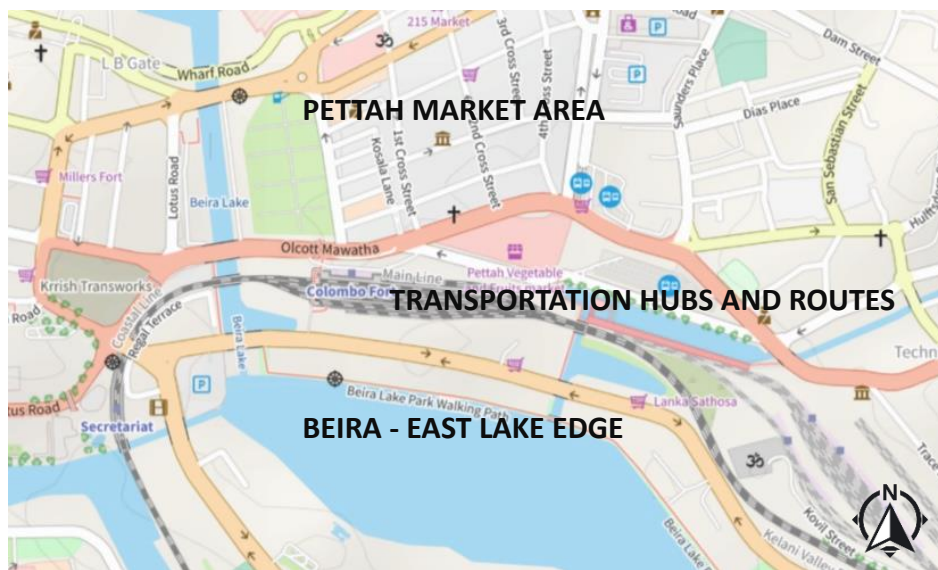


Figure 6 – Selected area for the project
Source : Author



Figure 7 - Identified city layers
Source : Author

5.2.Goals and objectives

Ensuring functional equality through connectivity – Proper accessibility to all areas of the site will be provided. This will reduce the unevenness of pedestrian distribution within the city. Each proposed space will facilitate infrastructure to create a functional space throughout the site.

Enhancing quality of life – The project will help to improve the living conditions of the city residents by improving social, environmental and economic sectors of the city.

Preserve cultural and heritage identity – The project will ensure to protect the cultural heritage of the city by conserving the buildings and spaces which contribute to enhancing the city image while clearing out structures which affect negatively to the overall city appearance.

Therefore, the main objective of the project is to ‘Implement a holistic approach towards elevating city image by addressing waterfront accessibility and improving city connectivity through pedestrian friendly transportation networks and green infrastructure integration into the city by enhancing existing city features through renewal and clearing structures damaging the overall image’.

Cheonggyecheon Stream Restoration Project in South Korea Sabarmati Riverfront Development in India and Pontevedra City Center Pedestrianization in Spain were analyzed as urban renewal case studies for the proposed design.

6. Planning and design development

This stage will analyze the selected area and will use urban renewal and landscape architectural principles to address the issues and enhance the potential of the area. The proposed design will be aligned with the proposed goals of the project. The planning and design development was carried out in 5 sectors.

1. Site analysis
2. SWOT analysis
3. Proposed Zoning plan.
4. Conceptual Design approach
5. Proposed Design plan

6.1.Site analysis

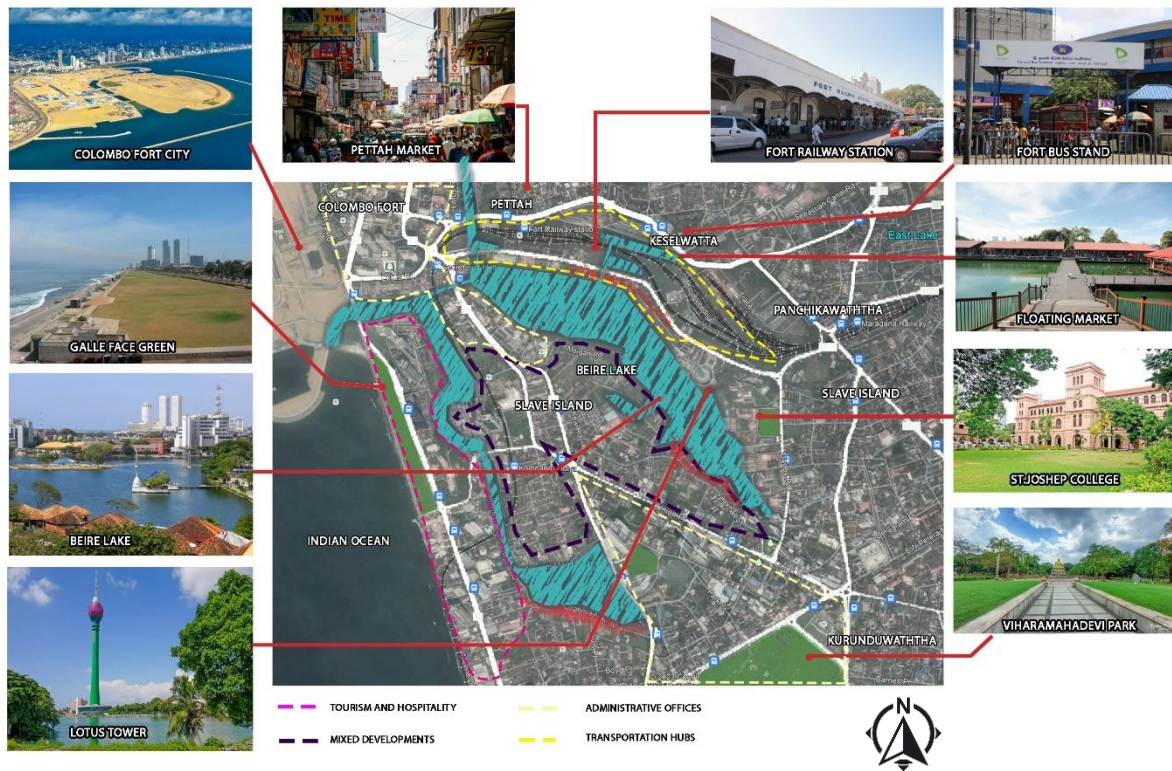


Figure 8 - Site analysis
Source: Author

6.2.SWOT analysis

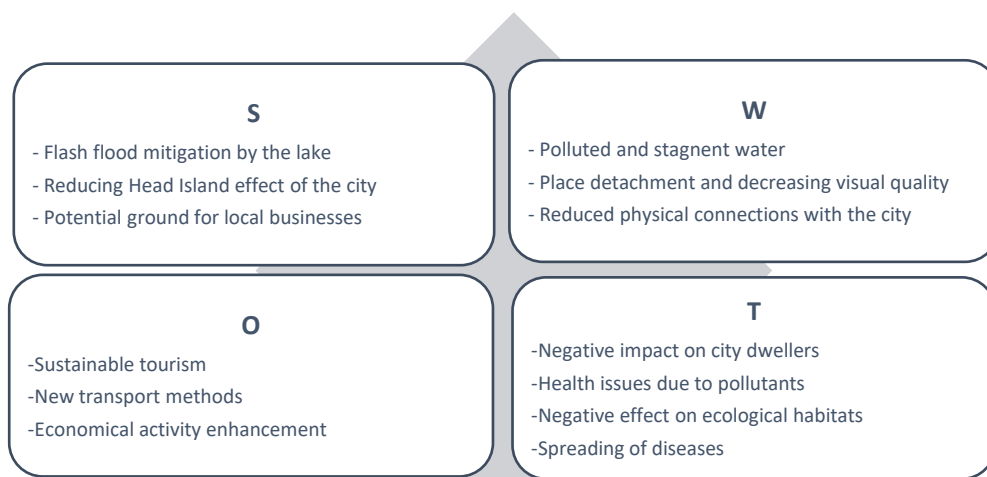


Figure 9 - SWOT analysis
Source : Author

The current situation of the Beira Lake Colombo is not in a good condition due to numerous reasons. The following are some of the main issues identified during the analysis.

1. Polluted water bodies lowering the quality of life in the city by affecting social health and creating environmental issues.
2. Lack of effective connectivity between the city and the Beira Lake resulting in low development and low engagement opportunities in the city.
3. Human Circulation is limited to commercial areas of the city thus making the city crowded and congested in certain parts of the city.
4. Lack of proper accessibility to the lakeside and existing recreational activities impacting the economy of city business community and dwellers
5. Unauthorized constructions disrupt the city image by affecting the beauty and aesthetics of the surrounding environment.

6.3. Proposed zoning Plan

Zoning plan for the proposed project was developed using the basic analysis to identify the existing potential features of the selected site and to propose zones accordingly to enhance the activity. This plan will promote the commercial, residential, and recreational connectivity within the city limits.

Commercial Zone – The zone which consists of most of the commercial activities of the area comes under this zone. The enhancement of commercial activity by providing a friendly user environment to this area is the main objective.

Transportation Zone- The main Colombo Fort railway station and the bus stand is located beside the main road within this area. This area will be developed as a transportation zone across the city and as well as between the commercial and the recreational zone proposed above.

Recreational zone – This zone has the closest approach to the water body, thus easily facilitates the usage of water in to the city for various activities.

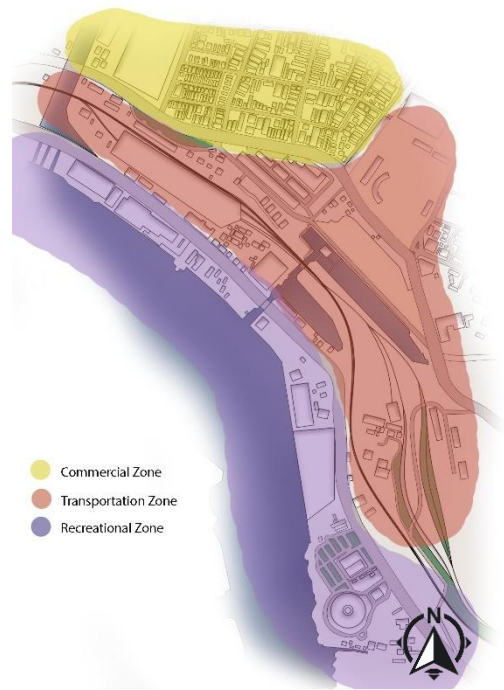


Figure 10 - Proposed zoning plan
Source : Author

6.4. Conceptual design approach

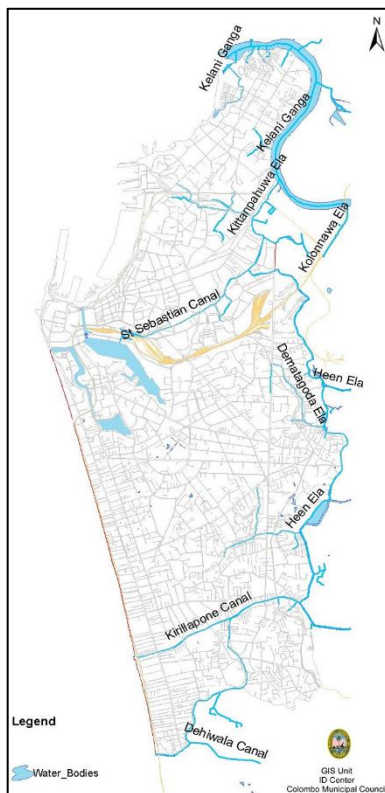


Figure 11 - Wetland Mosaic of the Colombo city
Source : <https://thearchive123.blogspot.com/2019/03/>

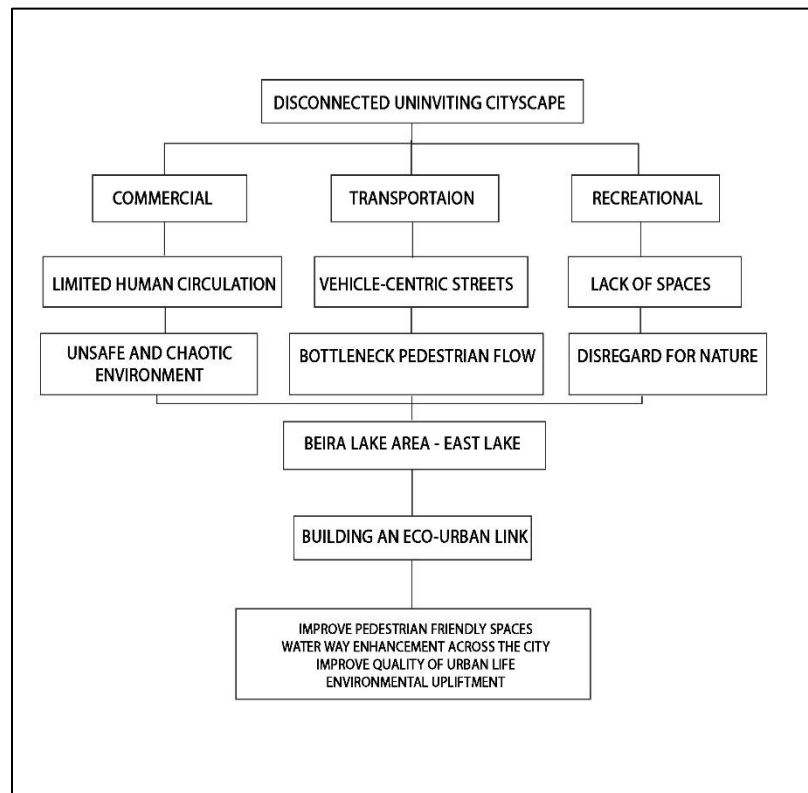


Figure 12 – Proposed conceptual approach
Source : Author

Colombo city is distributed across a mosaic of water ways and wetlands. Using the same basis, the concept approach was to create a network of water ways which will infiltrate the selected site areas and aid in creating an even human circulation throughout the selected site.

6.5. Proposed design plan

As shown in the figure above, the issues created in each of the above-mentioned layers will be mitigated by creating a physical link between the three zones. The flexibility of parts of the city is strongly linked to the phenomenon of the decay of certain zones with the general development over time (Rossi, 1966). The main focus of the development will be the Beira East Lake. All the links starting from the commercial zone will lead up to the lake bank which provides areas for recreation and relaxing. This will create more opportunities for human engagement with the cityscape itself. A deep concern in some renewal projects is the need to decrease the existing housing density as there is a requirement to design more open spaces and accessible public facilities for residents. (Lin and De Meulder 2012). Redevelopment, Rehabilitation and environmental improvements and economic renewal will be the main principles used to approach the project.

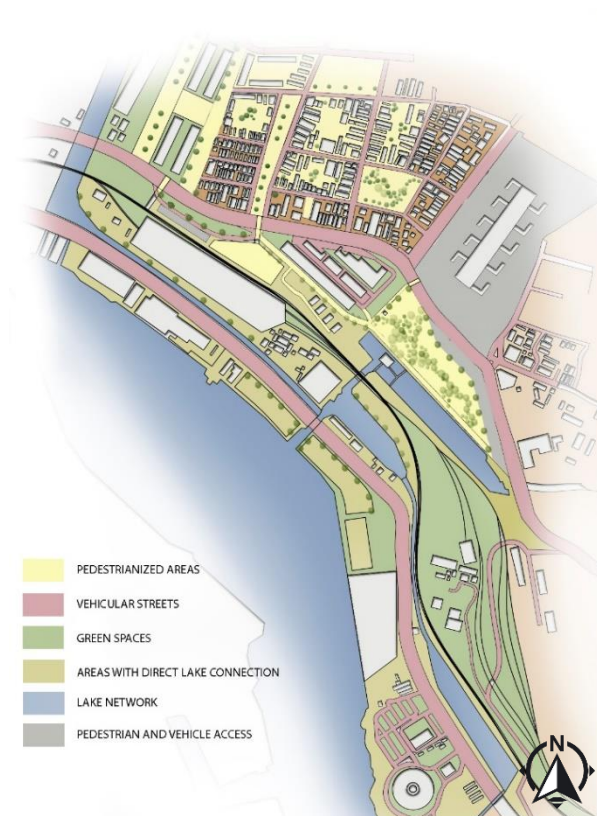


Figure 13 - Proposed design layout
Source : Author

As shown in the design map Figure 13, the design will increase the number of pedestrianized areas in the commercial layer. The densely packed shops and streets will be fragmented by allowing more space in between each block for city squares or pedestrian only pathways. Vehicle circulation will be allowed only on selected roads linking the main roads across the grid patterned urban blocks. Perimeter blocks will be introduced with accessible courtyards. The commercial zone and the transportation zone will be linked by overhead pedestrian bridges. One bridge is already existing in the site. This helps to reduce the traffic congestion allowing a continuous flow of vehicles across the main road. Bus station structure will be changed so that the user navigation is easier compared to the existing structures.

The first phase of the project will extend the waterways up to the transportation zone. Spaces will be created for direct and indirect interactions with the waterways. Such as aesthetic improvement of the train station surrounding or open-air spaces allocating people to engage with activities in water.

The second phase will extend the waterways up to the commercial areas depending on the results of the first phase. The overall design will improve the flow of human circulation across the city by attracting users to the lakeside. Which is covered by buildings in the existing site.



Figure 15 - Existing section of the pettah streets
Source : Author



Figure 14 - Proposed section of the pettah streets
Source : Author



Figure 16 - Proposed design for pettah city square/streets
 Source: <https://www.canva.com/ai-art-generator/>



Figure 17 - Proposed design of water ways and green spaces
 Source: <https://www.canva.com/ai-art-generator/>



Figure 18 Proposed design of water ways for aesthetic improvement
 Source: <https://www.canva.com/ai-art-generator/>

7. Design analysis and project outcomes

7.1. Impact on the community

The design affects the community of the city and shapes their livelihood and identity. The proposed design will enhance the aesthetic appeal of the city area while creating a friendly safe environment to the city dwellers. In practical terms, the community engagement in decision making is highly important to select the best approach to address the community issues. In the post project scenario, the impact of the design will affect the economic status of the community. Upliftment of local businesses based on the lake, pettah market area or even in the transit zones will take place due to the evenly distributed human circulation throughout the area compared to the existing situation. Providing recreational areas, such as open-air museums, theaters and shopping complexes and markets close to the newly proposed waterways will help the community to break from their stressful life and enjoy the nature for a certain amount of time.



Figure 19 - Fishing in Beira Laka Source:
<https://www.shutterstock.com/>



Figure 20 - Green spaces allocated for pedestrians only
Source: <https://www.snehasnani.in/2018>

7.2. Impact on the economy

The design will create a functional aesthetically pleasing urban area in the heart of the city. This will in turn attract tourists to the Colombo city more. Thus, investors and entrepreneurs will be willing to lend hands in continuing the development further. This provides the basis for economic growth. Increasing developments will generate more job opportunities for the community. As the main capital of the city, economic revitalization will be a great opportunity to support the city development.

7.3.Impact on the environment

Given that Colombo is located on a matrix of wetlands, the environment including waterways, wetlands and green spaces gets easily polluted due to the misuse of the surrounding areas. Thus, opening the city waterways to the community and providing direct connectivity to the city will help to reduce this. The more engagement the community has with the environment, these places become more precious and valuable to the people. Colombo city is highly urbanized which contributes to the urban heat island effect. Therefore, having more green infrastructure will mitigate the effect it has on the city. Pedestrian friendly transportation will support low carbon emissions and improved air quality.

8. Challenges and adaptations of the project

The project is about enhancing the quality of life in the city of Colombo. But the major challenge in this project is based on the Beira Lake context.

8.1.Addressing the water pollution of the lake.

The water of the lake is highly polluted. Thus, the water quality is very low to the point that the interaction with water is risky to the user. Therefore, as a part of the project, reducing the pollution of the lake needs to be addressed. For example, storm water management, implementation of proper wastewater management and green buffer zones can be introduced. Aquatic ecosystems in urban fabric cannot be restored completely, but they can be rehabilitated to support desirable biota and water quality (National Research Council 1996) . Current governmental proposals initiated such a project where ecological floating islands were introduced to the lake. This created new habitats in the aquatic environment.



Figure 21 - Ecological floating islands

Source: <https://www.globaltimes.cn/>

8.2. Clearance of the unauthorized constructions

When it comes to clearing the unauthorized constructions, the community opposition is one of the main issues to resolve. Given the amount of time they have been residing in such places, dwellers are reluctant to move out of their houses. Therefore, providing apartments or lands for the owners will help to solve this issue to a certain extent. Legal issues and property issues will also arise when addressing this problem.

8.3. Managing infrastructure and accommodating waterways

When proposing the water way network across the site, it conflicts with the main transportation routes of the city. Therefore, technological aspects and land use aspects should be taken into consideration when proposing the water channel system. Especially if water is considered as a city transportation medium in the later phases of the project.

9. Conclusion

In conclusion, this project serves as an urban renewal project which identifies the main issues and potentials of the urban fabric and integrate each other to provide a new transformation to the city of Colombo. Beira Lake which has been neglected and under-appreciated by the city will be used as the main link to connect the identified city zones. While providing aesthetically pleasing and attractive visuals to the city, the water network will help to mitigate urban heat island effects and control the microclimate within city limits. Integrating human circulation towards the lakeside will also help to attract economic upliftment through visitors, investors and local business. This will not only help to develop the city, but also to increase the environmental quality, social bonds and city life of the people. The overall city image will be reflected upon the design outcome. In the master plan level, the same project can be implemented with different approaches in different sections of the Beira Lake depending on the project success in the later phases of the project. This positive urban transformation will build up a much safer, healthier and interconnected city life for current and future generations in the city of Colombo.

References

- Adams, D., & Hastings, E. M. (2001). Urban renewal in Hong Kong: transition from development corporation to renewal authority. *Land Use Policy*, 18(3), 245e258. [http://dx.doi.org/10.1016/S0264-8377\(01\)00019-9](http://dx.doi.org/10.1016/S0264-8377(01)00019-9).
- Angelovski, I. (2014). *Neighborhood as Refuge: Community Reconstruction, Place Remaking, and Environmental Justice in the City*. MIT Press.
- Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners*, 35(4), 216-224.
- Chan, E. H. W. & Yung, E. H. K. 2004. Is the development control legal framework conducive to a sustainable dense urban development in Hong Kong? Habitat International
- Chang, I. S., Lee, D. K., & Seo, Y. (2016). Urban waterfront regeneration as a sustainable approach to climate adaptation: Lessons from the cases of Ijburg, Netherlands, and Marina Bay, Singapore. *Journal of Marine and Island Cultures*, 5(1), 40-50.
- Couch, C. (1990). *Urban renewal: Theory and practice*. In Macmillan building and surveying series. London: Macmillan Education.
- Couch, C., Fraser, C., & Percy, S. (2003). *Urban Regeneration in Europe*. Blackwell.
- Couch, C., Sykes, O., & Börstinghaus, W. (2011). Thirty years of urban regeneration in Britain, Germany, and France: The importance of context and path dependency. *Progress in Planning*, 75(1), 1–52.
- Dahanayake, H. D. and Wickramasinghe, D., (2022). Impacts of floods on Colombo during two decades: Looking back and thinking forward. *Progress in Physical Geography: Earth and Environment*,
- Ehrenfeld, J. G. (2000). Defining the limits of restoration: The need for realistic goals. *Restoration Ecology*, 8(1), 2-9.
- European Environment Agency. (2016) *Climate change impacts and vulnerability in Europe report*
- Fainstein, S. S. (2001). *The City Builders: Property Development in New York and London, 1980-2000*. University Press of Kansas.
- Forester, J. (1999). *The Deliberative Practitioner: Encouraging Participatory Planning Processes*. MIT Press.
- Gehl, J. (2011). *Life Between Buildings: Using Public Space*. Island Press.
- Hyra, D. S. (2012). Conceptualizing the New Urban Renewal. *Urban Affairs Review*, 48(4), 498–527. doi:10.1177/1078087411434905
- Ho, D. C. W., Yau, Y., Poon, S. W. & Liusman, E. 2012. Achieving Sustainable Urban Renewal in Hong Kong: Strategy for Dilapidation Assessment of High Rises. *Urban Planning and Development*
- Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, 4(1), 1–23.
- Jacobs, J. (1961). *The Death and Life of Great American Cities*. Random House.

Lin Y, De Meulder B (2012) A conceptual framework for the strategic urban project approach for the sustainable redevelopment of “villages in the city in Guangzhou.

Madanipour, A. (2010). *Whose public space? International case studies in urban design and development*. Routledge.

National Research Council. (1992) *Restoration of aquatic ecosystems: science, technology, and public policy*. National Academy Press, Washington, D.C

Peng, Y., Lai, Y., Li, X. & Zhang, X. 2015. An alternative model for measuring the sustainability of urban regeneration: the way forward. *Journal of Cleaner Production*

Roberts, P. & Sykes, H. 1999. *Urban Regeneration: A handbook*

Rossi A (1966) *The Architecture of the City*, 1st edn. Martins Fontes, São Paulo

Urban Development Authority (2019), *Colombo Commercial City Development Plan – 2019-2030*

Whyte, W. H. (1980). *The Social Life of Small Urban Spaces*. Project for Public Spaces.

Zheng, H. W., Shen, Q., & Wang, H. (2014). A review of recent studies on sustainable urban renewal. *Habitat International*, 41, 272-279. <https://doi.org/10.1016/j.habitatint.2013.08.006>

Zukin, S. (1995). *The cultures of cities*. Blackwell.