International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 05 | May 2022 www.irjet.net p-ISSN: 2395-0072

Canal Oriented Development Concept as a tool for Canal: A case of Ugat canal, Surat City

Jay P. Prajapati[1], Palak S. Shah[2]

[1] *M.E. in town and country planning, Sarvajanik college of Engineering and Technology, Surat, India*
[2] *Ad hoc Assistant Professor, Sarvajanik college of Engineering and Technology, Surat, India*

Abstract - *Water is a valuable natural resource that is both renewable and finite. Water resources have played a critical role in the creation and construction of communities in most regions of the world throughout history. It's past time to think of them as assets rather than liabilities. Canal is being more neglected in most place and their significance is consistently underestimated. This study tries to identify the importance of canal and its relevance in urban form. It also tries to find out the impact of urbanization on the existing canal structures and different methods to revitalize the canals. The study also focuses on the waterfront development, canal-oriented development and ways of integration of canals and the city. Through this study different case studies were analyzed to identify the problems and potentials. Finally, strategies were proposed to integrate the canals into the city structure*.

Key Words: Canal Oriented Development, Urban Canal, Waterfront Development, Canal Front Development.

1. INTRODUCTION

Canals have become an integral part of countless cities around the world. Urban development has a direct impact on the canal system. In some cities such as Stockholm, Amsterdam, Bruges and Bangkok, canals serve as the lifeline of the city's water system. In addition to inland water transport and border security, the canal gives a unique urban character that enhances the image of the place. India has an extensive network of canals, most of which were built by the British for their own benefit. However, after independence, which was rapidly urbanized over time, these canals not only lost their identity, but also the purpose for which they were built. Most of them are left unattended and clogged with unhealthy sewage.

The usefulness of channels cannot be limited to their key functions, but requires broader insight into the diverse areas that channels contain. Transports stormwater during heavy rains, thereby protecting adjacent areas from floods, directly affecting the microclimate of the area, providing the coveted visual comfort of the public, balancing ecosystems, preventing pollution levels is one of the most important uses of the channel. These have been subdivided into various types depending on certain parameters.

1.1 Canal Oriented Development

Canal Oriented Development (COD) Creates Space Concept aims to create a mixed-use development of to along the banks of the canal, giving the image and practicality of the waterfront. It is used as a natural attraction of society. And economic activity is used. COD has the potential of a landlocked country without a traditional port to promote waterfront development (Buckman, 2016). The main advantage of COD is that it offers the luxury of being able to develop a large number of sites along the drainage area. For harbor fronts, you are limited to one. Depending on the activity and size along the trail, there may be different zones based on the sense of place caused by the sensitivity of the water. Creating functional neighborhoods in a sustainable environment is a great help in creating vibrant and inclusive neighborhoods and public spaces.

1.2 Benefits of Canal Oriented Development

1. Transportation
2. Recreational
3. Sustain the ecology
4. Intermixing Socio-cultural
5. Providing Surrounding background
6. Economic

2. CASE STUDY

1. Kakinada Canal Development Project

The Study area for the development of waterfront covers 2.5 km stretch starting from intraplate junction to nor bridge.

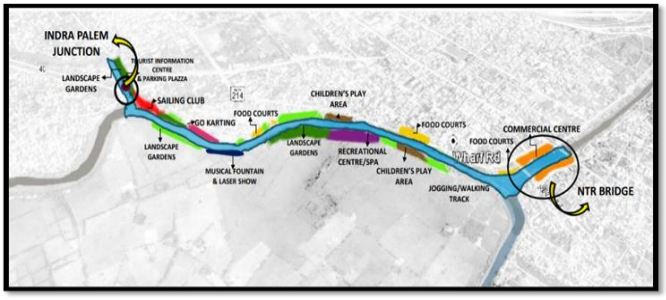

Fig.1 Kakinada Canal, Andra Pradesh

Purpose

- The project consists of development of commercial centers, food courts, ethnic restaurants, resorts, spa, sailing club jogging/cycling tracks etc.
- Boating Stations in the canal enable water recreation and offer a water-based mode of public transport in the future.
- In addition, many new parks, gardens and water sports facilities are being built on the reclaimed land.
- The parks shall enhance livability in the area that they are located in and strengthen the city's green network.

2. Mae Kha Canal, Thailand

The goal of this study area is to investigate how land use and community have affected and influenced the existing condition of the canal. The studied site starts from a 12-lane super-highway, the area that indicates the edge of urban boundaries, pass through dense residential and vibrant tourist-business area and down to the south of city center where Mae Kha Canal merges with Lakeway Creek from the West in local community area.

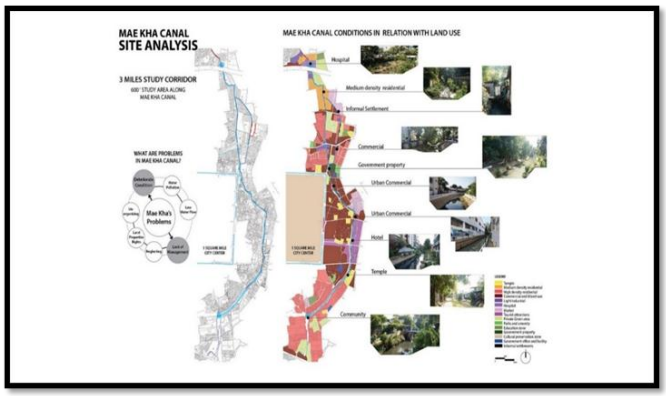

Fig. 2 Mae Kha Canal,Thailand

Purpose

- The purpose of this work is to focus on crowded urban areas and apply sustainable ecological approaches to mitigate pollution of the manufacturer's canals. The purpose is to bring the maker canal back to life so that people can interact with nature and wildlife. From an ecological point of view, the maker canal plays an important role as a green infrastructure to protect the city from floods and function as a stormwater drainage channel. In addition, the Maker Canal will serve as a new linear city park, promoted as a cultural green corridor for reconnecting people with water.

- This proposal has the potential to boost the city's economy and tourism. Based on thorough investigation, site analysis and site observation, the maker canal is likely to develop into a new green corridor in the city of Chiang Mai. The three-mile corridor in the center of the city provides accessibility and connectivity for the city, as well as a recreational space for people. In addition, this place will become a new tourist attraction in the city and promote economic improvement in the region. Along the flow of flow through different parts of the city, this provides a great experience for visitors.

3. STUDY AREA PROFILE

The selected site in the vicinity of Surat city is in the West Zone which is in the fast-developing part of the city. The West Zone consists of 8 wards. The area of the West Zone is 51.279 Sq.Km. and the population is around 5,61,329 as per the 2021.The selected site for canal oriented development falls into the Pal Gam area of West Zone as shown in Fig.

Table 1 Details of selected stretch

Details		
1.	Canal Width	10 m.
2.	Canal Length	1.5 km.
3.	Canal bank Width	4.5 m.
4.	Road Width	7.5m.
5.	Type of Canal	Perennial

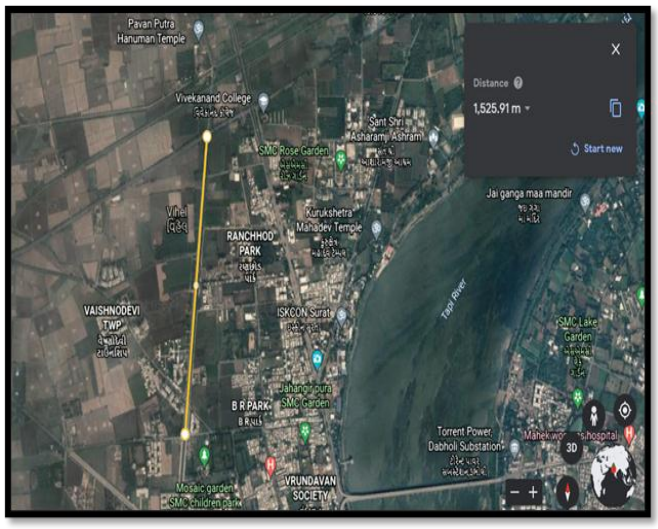

Fig. 3 Study area

4. PLANNING PROPOSAL

This figure shows the components are proposed to the different reservations.

Fig. 4 Location of Components

Table 2 Area of Components

No.	Proposal	Area (Sq.mt.)
R1	Landscape Garden	2400
R2	Go Karting	1225
R3	Parking Plaza	1050
R4	Super Market	4675
R5	Children's Play Area	1225
R6	Commercial Center	5625
R7	Food Court	1450
Total		17,650

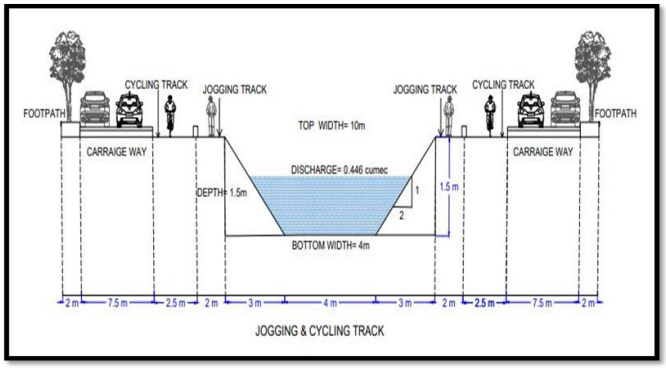

Fig. 5 Cross section of canal

Fig. 6 Top view of proposed site

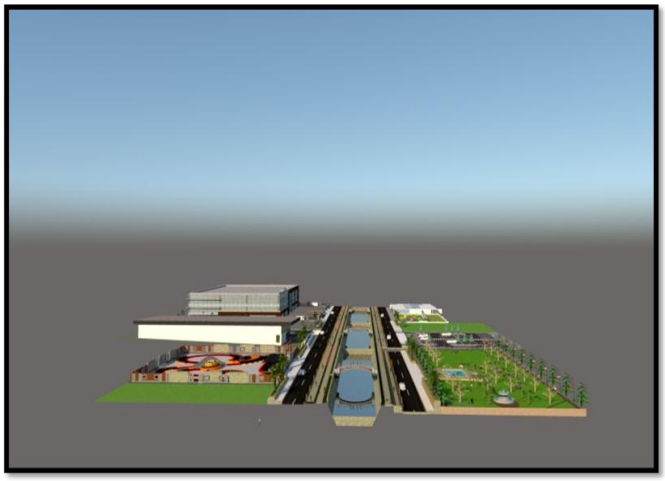

Fig. 7 Front view of proposed site

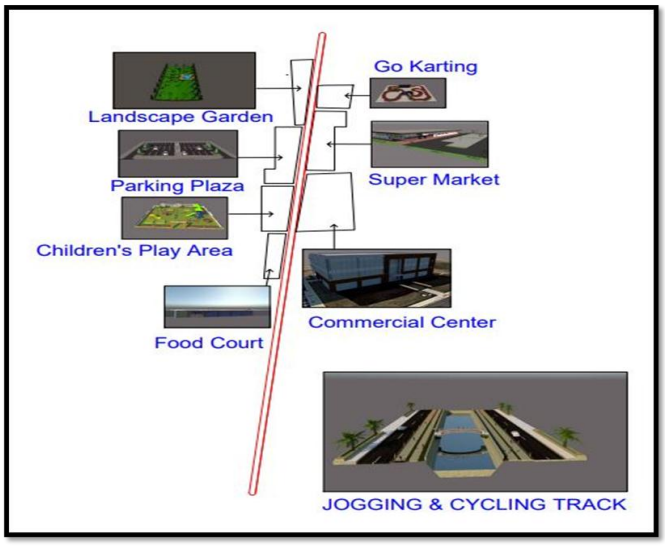

Fig. 8 Proposed Ugat Canal

5. CONCLUSIONS

The study was an attempt to formulate planning strategies for the development of canals and its surrounding area in the city. This was done through Canal Oriented Development Concept. Different planning components are selected based on public opinion and experts for the formulating strategies that include redefining spatial structure, integrating canals in city structure, developing canal as urban spine and improving waterbody and urban space.

This study includes the design of different components around canal like a walkway, cycling track, etc. keeping in mind for improving the health of its user. Also for sustainable development, landscape garden is developed as an essential part of project which can lead to decrease a level of pollution to some extent. The proposed development site can enhance commercial center, Go karting track, super market, Food court to attract people around the canal and also providing nonconventional recreational spaces like children playing area and parking plaza will facilitate people and provide easy and safe parking space.

REFERENCES

1. Hamizah yakob, Fatimah Yusof, H. H. (2013). Sustainable Urban Housing Development through Planning Mechanism : Issues and Challenges. August, 20–22.

2. Ji Jin. (2018). Riverfront Redevelopment in a Medium-Sized City : Taking White River Sites in Downtown Indianapolis As an Example a Creative Project Submitted To the Graduate School in Partial Fulfillment of the Requirements for the Degree Master of Landscape Architectur.

3. Kisan, M., Sangathan, S., Nehru, J., & Pitroda, S. G. (1993).

4. M/S HYPER CUBE DESIGN CENTRE PVT. LTD. (n.d.). Integrated Development and Beautification of Warf Road Canal in Kakinada.

5. March, A. D. (2005). CANAL BANKS REDEVELOPMENT AREA PLAN DEPARTMENT OF HOUSING AND ECONOMIC DEVELOPMENT. June 1996.

6. Amendments, P. (2020). Comprehensive Plan Urban Design Element Comprehensive Plan Urban Design Element. April.

7. Chauhan, K., Dalal, J., & Agrawal, P. (2013). Urban Design of Surat (Gujarat , India) Using Sustainable High Rise Development Technique.

8. Commission, C. W. (2014). , Guidelines for Planning of. January.

9. Cooperation, G. (2018). Study on the Mae Kha Canal. November.

10. Coutts, C. (2009). Multiple Case Studies of the Influence of Land-Use Type on the Distribution of Uses along Urban River Greenways. Journal of Urban Planning and Development, 135(1), 31–38. https://doi.org/10.1061/(asce)0733-9488(2009)135:1(31)