

PAPER • OPEN ACCESS

Spatial Planning on Riverfront Urban Area in Banjir Kanal Barat Semarang

To cite this article: E Darmawan *et al* 2017 *IOP Conf. Ser.: Earth Environ. Sci.* **79** 012015

View the [article online](#) for updates and enhancements.

Related content

- [Teaching Methodologies in Spatial Planning for Integration of International Students](#)
Ana Virtudes and Victor Cavaleiro
- [Spatial planning as an adaptation strategy to climate change. A review of practice in Germany](#)
Dirk Heinrichs, S Beck and C Kuhlicke
- [Transformations of Tourist Functions in Urban Areas of the Karkonosze Mountains](#)
Katarzyna Przybya and Alina Kulczyk-Dynowska

Spatial Planning on Riverfront Urban Area in Banjir Kanal Barat Semarang

EDarmawan^{1,2}, T W Murtini^{1,2}, H Werdiningsih^{1,2} and A S Enis^{1,2}

¹Architecture Department, Engineering Faculty, Diponegoro University

²Prof. Soedarto SH Street No. 1 Tembalang, Semarang 50241, Indonesia

Phone : 081575337300; fax: 62-24-76480840.

E-Mail : edy_darmawan@yahoo.com

Abstract. Riverfront in Banjir Kanal Barat (Western Flood Canal) develops rapidly since its western part of the east banks side is developed as a recreation area. Banjir Kanal Barat is also used for the venue for special occasions. Along the banks of rivers there are street vendors that sells second-hand goods and behind it there are densely populated residential. It is quite interesting, but it also takes high risk because the surroundings are prone to flood. The existing recreation area was built without considering flood-prone locations. Therefore, on this research, the researchers will design spatial planning in the area Banjir Kanal Barat river in order to make it more interesting for tourism. To achieve this goal, several aspects in Hamid Shirvani's theory will be applied, so the important aspects able to attract people to visit Banjir Kanal Barat will be identified. Comparative qualitative research methods used with a direct view conditions on the field and study literature. From the analysis it can be known the lack of harmony between the use space in Banjir Kanal Barat with buildings in the surrounding areas so it needs the optimization the use of space to be around it with the function of Banjir Kanal Barat.

1. Introduction

Canal is a water duct made by human for various needs and is usually a part of river flow that has been widened and deepened at some areas [1]. The functions of canal are as a part of flood controlling system and as a means of transportation. *Banjir Kanal Barat* Semarang is one of the canals controlling the longest river in Semarang. It is the downstream of *Kali* (river) *Garang* which flows to the north from Mount Ungaran to two main branch streams, *Kali Kreo* and *Kripik*. *Banjir Kanal Barat* is located at the boundary of West Semarang and South Semarang, from *Kali Garang* bridge to *Bojong Salaman*. It was built by Dutch to control flood frequently happening in Semarang. Maximum discharge of *Banjir Kanal Barat Semarang* is 740 m³ / second. Up to now, the existence of this canal is still preserved, and it works as the main drainage system of Semarang City that moves water or liquid waste to Java Sea.



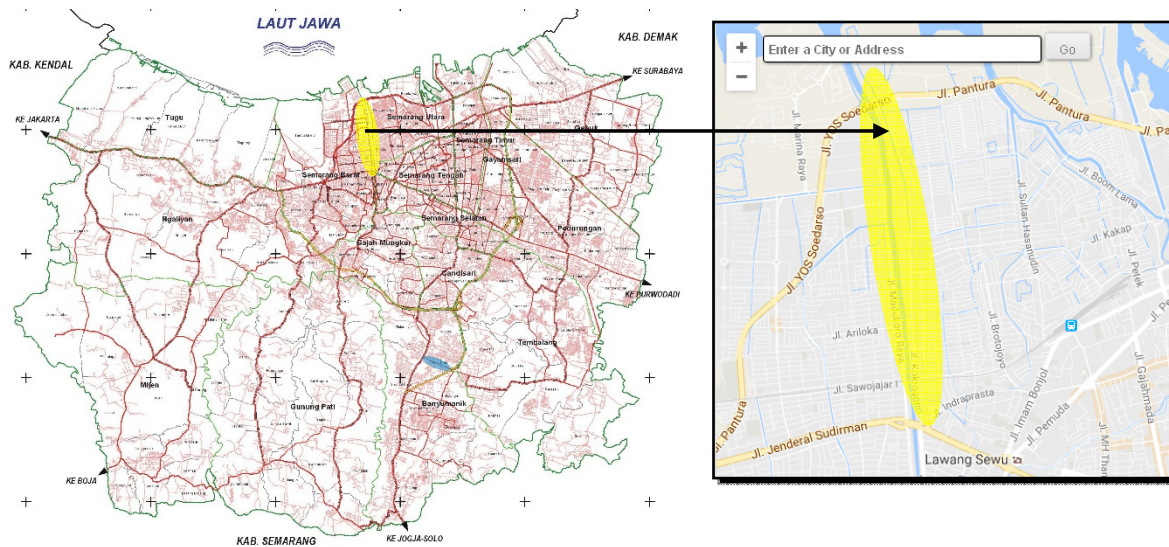


Figure 1. The Location of *Banjir Kanal Barat*.

In 2010, *Banjir Kanal Barat Semarang* is normalized in order to organize its riverside and to optimize its function. Before being normalized, there were many bushes and reeds. In its centre, there was sediment caused by erosion from *Kali Garang*. Hardening of sedimentation is also seen in the riverside, and it shrinks the river. This problem makes *Banjir Kanal Barat Semarang* cannot optimally function because it reduces the volume of water that can be accommodated which eventually makes the water overflow and causes flood around the area. After being normalized, *Banjir Kanal Barat Semarang* is wider, cleaner, and more well-maintained, and it also works normally as flood controlling canal. In fact, the river, ± 5.3 km in length and 160 m in width, has become the recreation ground of Semarang. Semarang City Government has also been preparing to make this area as a tourist destination.

Development of the *Banjir Kanal Barat Semarang* as a location for recreation and tourism destinations is quite interesting, because the arrangement of the riverside area by utilizing the potential of natural and accessibility aspect can provide a maximum view and allows users to perform recreational activities or travel. However, in its development should not only focus on the area along the river, but also need to consider the surrounding area in order to obtain maximum results. On the banks of the river along the way in the *Banjir Kanal Barat Semarang* itself there are stalls of vendors selling second-hand goods, where the presences of these traders sometimes use the area which can cause congestion. This condition can certainly interfere with access to people who want to visit the *Banjir Kanal Barat Semarang*. On the back of the stalls traders are densely populated settlements that require further arrangement because the condition tends to be seedy. Based on these problems, then the purpose of this study was to design the spatial planning in the area of the *Banjir Kanal Barat* river to be more attractive for recreation. Aspects of the theory of Hamid Shirvani will be implemented in detail, both land use, building form and massing, pedestrian ways, open space, signage, support activity, parking and circulation, and conservation. Of these theories will be determined aspects in accordance with the conditions around the *Banjir Kanal Barat Semarang*. The results of this study are aspects that can attract people to visit the *Banjir Kanal Barat Semarang*.

2. Methods

The research method is basically a way to get data with a specific purpose and usefulness [2]. Into this report, methodology used is descriptive qualitative. Implying the methodology qualitative descriptive as a method used to describe and outline the findings in the field that aims to collect

information in actual and detail, identify problem, making comparisons or evaluation, and determine what anybody else is doing in the face of the same problem and learn from experience them to set the decision in time to come [3]. The use of the methodology qualitative descriptive in this report used to get an overview of design spatial planning at *Banjir Kanal Barat Semarang* and outline the findings in the field in actual and detail in the form of object in a field made in the form sketches shots and photos. Types of research methods will be implemented are included in the survey were used to obtain data from a particular place in nature (not artificial), but the researchers did treatment in data collection. For example, by distributing questionnaires, structured interviews, and observation [2].

This research aims to design spatial planning at *Banjir Kanal Barat Semarang*. For this aims our research strategy using the survey method. The first step in our research is identify physical condition and activities in *Banjir Kanal Barat Semarang*. This step is taken to determine characteristics in this area. For this, researchers conducted direct observations in the field and supported by documentation to reinforce the data obtained from the observation. The second step is applying Hamid Shirvani's Theory in *Banjir Kanal Barat Semarang*. Data obtained through literature study and field observations.

The results of the data collection and analysed by qualitative descriptive analysis techniques incorporating photos or pictures and tables as supporting information. Data analysis is the process of systematically searching for and compiling data obtained from interview, fields notes, and other materials that can be easily understood and its findings can be communicated to others [4]. Activity in the data analysis is based on classifying data based on variables and types of respondents, tabulate the data based on the variables of all respondents, presenting the data of each variable studied, perform calculations after that drawing conclusions from what has been done.

3. Result and Discussion

The development of *Banjir Kanal Barat* as recreation area of Semarang should not only focus on the riverbanks, but it should also consider the surrounding to obtain the optimal result. Therefore, on this research, researchers will observe and analyse the condition around *Banjir Kanal Barat* by applying *Elemen Pembentuk Kota* (elements that form a city) theory of Hamid Shirvani, so the aspects which can attract citizens to visit *Banjir Kanal Barat* can be identified, and these are the explanations:

a. Land use

Tata Land use is regulating of land to decide the best choice of allocating certain function [5]. Land use around *Banjir Kanal Barat* is for settlement, offices, education, trades, and conservation. The existing settlement is densely-populated settlement with mixed-functions along the riverbanks of *Banjir Kanal Barat*. Those houses are not well-arranged, so it looks slummy. Besides, there are street vendors building their stalls along the riverbanks as seen in Figure 2 below. The growth of street vendors classified as informal sector in one area is a natural symptom. However, if it is uncontrollable, it will affect the land use quality around *Banjir Kanal Barat*. Therefore, the possible design is optimizing land use in the riverside for green open space that can be used social activities and creating open spaces integrated with residential areas. Optimizing room can be achieved by rearranging residential area or relocating the residential areas and then directing them into vertical residence to reduce density. Besides, land use should also be provided with smooth movement. Road planning should be done appropriately and should consider ongoing activities, location, width, material, and construction.



Figure 2. Street Vendors in Riverbanks.

b. Building Form and Massing

Building form and massing discuss how shapes and masses of buildings can form a city and how the relation among the masses [6]. Building form and massing are not only determined by the height or the size of the building and the appearance or the configuration of the building mass; but they are also determined by the environmental impact in order to create a building with good quality and appearance. By focusing on the previous elements, a more harmonized design of building view that blends with surrounding historical buildings can be realized. Around *Banjir Kanal Barat*, the building forms and massing are mostly square or rectangular because most of the people dwelling there live in one or two-storey houses, and there is also a line of shops located along the road. The orientation of those buildings is toward the canal. The façade of the buildings, seen in Figure.3, looks dull because the area is densely populated and not well-arranged. Based on the planning, the height and the scale of the buildings will be adjusted with human scale (except for the landmarked buildings), and the appearance of the buildings will be improved by adding a new architectural concept or style which is more attractive or dynamic and also compatible with its development planning for recreational area. The planning, furthermore, will be conducted without neglecting factors such as safety, convenience, and stability of the building and will consider its environmental topography in order to avoid damaging its natural condition.



Figure 3. Looks Buildings Around *Banjir Kanal Barat*.

c. Circulation and Parking

Circulation is a part of urban planning elements that is directly able to shape and control pattern of activities in a city while parking is the supporting element for urban circulation system that determines whether an area is lively or not [6]. *Banjir Kanal Barat* is located at the main line of transportation in Semarang City. This area is actually accessible and supported by sufficient number of public transportation vehicles having relatively long duration of service. The problems are that the circulation system is still not well-managed and that the parking lot is unavailable. These problems have made many people use road as the parking area which are seen in Figure.4. This ‘on the road’ parking system quite disturbs the circulation, and it gets worse especially when there is an event held near the area because the event suddenly creates additional temporary

parking areas. These temporary parking lots are managed by people who live surrounding the areas in order to avoid conflict triggered by harsh competition for areas and incomes. Circulation and parking are the common problems faced by big cities, and therefore, the planning will include designing streets to be open spaces having good view and provided with attractive landscape elements. In addition, it is necessary to provide parking spots for the people doing activities in *Banjir Kanal Barat*, and these parking spots must be in the specific areas, so the circulation of vehicles does not overlap the circulation of pedestrians.



Figure 4. Conditions Parking Around *Banjir Kanal Barat*.

d. Open Spaces

An open space is defined as an area in a city which is not developed for some uses [7]. Open spaces give contribution in shaping the character of a city and has a function as rooms for social interaction, economic activities, activities related to cultural appreciation [5]. The open spaces at *Banjir Kanal Barat* consist of park, road, and field, yet their condition has not been maximally utilized because most of the areas are occupied by street vendors. These street vendors, who are not well-managed, have made the area looks slummy. In order to return the real function of the open space at *Banjir Kanal Barat*, the planning will include developments of creative spaces and a space for communities that harmoniously blend with the environment surround them. The developments will consist of adding more rooms for attractions or shows and adding areas for children to play, so people can do their outdoor activities and have rooms for discussion or social gathering. In the area *Banjir Kanal Barat* actually there had been park provided to accommodate activities the citizens, only because of a lack of vegetation as seen in Figure. 5. This area feels hot during the day, so people are refusing to come to this place.



Figure5. Park in *Banjir Kanal Barat*.

e. Pedestrian Ways

Pedestrian ways are one of open spaces becoming a part of the street and having dynamic character because it is next to the road [8]. According to Nuzuluddin (2015), a pedestrian way has function of a circulation room for pedestrians which is separated from the vehicle circulation [9]. Pedestrian ways are considered as the boundary between roads and buildings, and therefore it is

important to consider their safety and convenience. Unavailability of walkways causes pedestrians to not maximally feel safe and convenient at *Banjir Kanal Barat*. These pedestrians usually use some part of the road since there is no real boundary between road for vehicles and pedestrians. A pedestrian way is only available along Jl. Jend Soedirman and Jl. Soegijopranato where both streets are classified as main arteries. There is actually a pedestrian way along Jl. Kokrosono, but this pedestrian ways, seen in Figure. 6, is too narrow and occupied by street vendors. Therefore, the planning will include building a wide pavement covered with paving blocks and provided with shade trees and chairs for pedestrians to ease tiredness, and for some places, there will be bus stops giving easy access for pedestrians to take the bus.



Figure 6. Conditions Pedestrian Ways Around *Banjir Kanal Barat*.

f. Activity Support

Activity support are all functions of buildings and activities that support a city area [10]. Activity support around *Banjir Kanal Barat*, trades done by street vendors where permanent and semi-permanent stalls, are blended with dwellers' activities which can be seen in Figure. 7. In addition, considering that this site is built for recreational area there are also sport and recreational activities. The commercial activities around this area have specific characters and have taken place since long time ago, and for that reason, the planning for the commercial activities at this place will include developing 'people's market' that will support the recreational activities. This development, also parking area development, will certainly not disturb the previous business activities and the circulation at *Banjir Kanal Barat*.



Figure7. Activity Support Around *Banjir Kanal Barat*.

g. Signage

Signage can be defined as directions, road signs, advertisements, and other signs [6]. The existence of signage will influence visual appearance of a city. Well-designed signage can show the character of buildings' façade and make streets lively. Several things needing to consider in setting signage are the velocity of vehicles, the distance of reactions, numbers of listed words, and the dimension of writings on boards. Based on the study, the location of signage is not well-arranged, and therefore it is still unable to give information clearly. Referring to the problems, the

use of signage will be regulated based on its distance, size and also its existence that reflects the characters of the area. Additionally, the use of signage must also be harmonious with the buildings' architecture around *Banjir Kanal Barat*.

h. Conservation

Conservation must protect the existence of a city's environment and spaces namely building sites or historical areas [6]. *Banjir Kanal Barat* that was built by Dutch in colonial era should be preserved, and this effort can be a way to earn back people's trust [6]. The conservation of *Banjir Kanal Barat* is connected to activities of people who grow and dwell around the area. Moreover, there is also a weir called *Bendungan Simongan* which is included as one of the conserved buildings, can be seen in Figure. 8. This weir was built by the Dutch in the beginning of twentieth century to control water flow from *Kali (River) Garang* to *Kali Semarang* and *Banjir Kanal Barat*. The existence of the weir is still preserved until now, but there are some problems related to treatments, maintenance, and cleanliness causing the accumulation of trash around the weir's gate. If *Bendungan Simongan* were well-preserved, it would bring a beautiful panorama of water. Thus, the regional planning will also contain development of *Bendungan Simongan* to be recreational area offering a journey in which visitors explore the rivers and enjoy views along riverbanks.

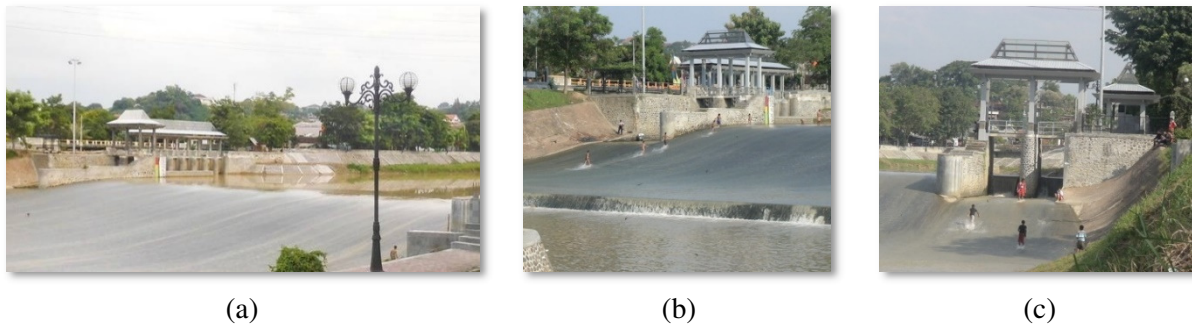


Figure 8. *Bendungan Simongan*.

4. Conclusions

Based on the result and discussion can be known that the lack of harmony between the use of space in *Banjir Kanal Barat* with buildings in the surrounding areas that can be seen from:

1. Land use around *Banjir Kanal Barat* has mixed function such as for settlement, for trade, and for education.
2. Building form and massing is in square or rectangular, and height of the building ranges from 1 until 2 storeys facing toward *Banjir Kanal Barat*.
3. Circulation around *Banjir Kanal Barat* is still overlapped each other, and the pedestrian ways is unavailable, but it's not accessible clearly. The parking area still occupies some part of the street and is not well-arranged.
4. The existing open spaces have not been utilized because they are occupied by street vendors, open space available at the edge of the river.
5. The needs of pedestrians for convenience and safety have not been fulfilled because there is no pedestrian ways and there is no a clear boundary separating vehicles and pedestrians.
6. Activity support like trades are not well-managed, so the area looks slummy and untidy.
7. The existing signage is still not arranged well and less informative.
8. *Bendungan Simongan* is one of conserved buildings that has not got maximum treatment and maintenance even though this weir has vital role for Semarang City.

Acknowledgements

The authors say thanks to all those who have helped in collecting data used in this article as a part of the objective of our research for spatial planning on riverfront urban area.

References

- [1] Jacksi, E. 2011. *Mengenal Kanal dan Fungsinya*. www.elisabethjaksi.blogspot.com
- [2] Sugiyono. 2008. *Metode Penelitian Kuantitatif, Kualitatif dan R & D*. Bandung: CV. Alfabeta.
- [3] Arikunto. 2006. *Procedure Research: A Practical Approach*. Jakarta: PT Rineka Cipta.
- [4] Sugiyono. 2014. *Memahami Penelitian Kualitatif*. Bandung: Penerbit Alfabeta.
- [5] Darmawan, E. 2003. *Teori dan Implementasi Perancangan Kota*. Semarang: Badan Penerbit Universitas Diponegoro.
- [6] Shirvani, H. 1985. *The Urban Design Process*. New York: Van Nostrand Reinhold.
- [7] Rapuano, Met. al. 1964. *Open Space in Urban Design*. Ohio: The Cleveland Development Foundation.
- [8] Mulyandari, H. 2011. *Arsitektur Kota*. Yogyakarta: Penerbit ANDI.
- [9] Nuzuluddin, T R. 2015. *Sirkulasi dan Parkir, Activity Support di Kawasan Peterongan Semarang (Penggala Jalan MT. Haryono Mulai Perempatan Lamper Sari Sampai Pertigaan Sompok)*. *Jurnal Universitas Pandanaran Semarang*.
- [10] Darmawan, E. 2003. *Teori dan Kajian Ruang Publik Kota*. Semarang: Badan Penerbit Universitas Diponegoro.