



Spatial Arrangement Analysis of Kampung Bintawa Hilir in Sarawak

Mohd. Anis Yaziq bin Alimin¹, Lek Heng Chan¹, Ahmad Sanusi Hassan^{1*},
Yasser Arab¹, Boonsap Witchayangkoon², Joesron Alie Syahbana³

¹ School of Housing, Building and Planning, Universiti Sains Malaysia, MALAYSIA

² Department of Civil Engineering, Thammasat School of Engineering, Thammasat University, THAILAND

³ Department of Urban and Regional Planning, Faculty of Engineering, Diponegoro University, Semarang, INDONESIA.

*Corresponding Author (Tel: +60 4 6576523. Email: sanusi@usm.my)

Paper ID: 12A2K

Volume 12 Issue 2

Received 02 October 2020

Received in revised form 01
December 2020

Accepted 04 December 2020

Available online 08

December 2020

Keywords:

Traditional Malay
Settlement; Kuching;
River village; Riverfront;
Urban design; City node;
Tertiary Landmark;
Religious landmark;
Urban design elements;
City path.

Abstract

This research discusses and identifies our case study's spatial arrangement at Kampung Bintawa Hilir in Kuching, Sarawak. The paper applies the qualitative research method by compiling information through a series of site visits, observations and interviews. The observers perceive their surrounding urban design elements. The noticeable elements may slightly differ from one to other observers, but they are collectively perceived with similar perspectives. The result shows that the district is the dominant urban design element that influences the village's path patterns, compared to the quality of nodes not as prominent as other urban design elements. The exiting nodes are only highlighted by less critical elements that are not easily identifiable through observation. They are only identifiable through the perception of localities. There is no open space or plaza within the village that could create a significant node. In short, the finding shows that the combination of urban design elements is considered satisfactory in highlighting the identity of Kampung Bintawa Hilir.

Disciplinary: Architectural Science and Urban Planning, Heritage Studies, Urban Development.

©2021 INT TRANS J ENG MANAG SCI TECH.

Cite This Article:

Alimin, M. A. Y. B., Chan, L. H., Hassan, A. S., Arab, Y., Witchayangkoon, B., Syahbana, J. A. (2021). Spatial Arrangement Analysis of Kampung Bintawa Hilir in Sarawak. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*, 12(2), 12A2K, 1-15. <http://TUENGR.COM/V12/12A2K.pdf> DOI: 10.14456/ITJEMAST.2021.32

1 Introduction

Sarawak was a south-western district of the Brunei Sultanate that sited along a northern coastal stretch of Borneo during the early nineteenth century. Kuching was one of the several Malay *kampung* situated inland of the swampy tidal basin at the Sarawak River. During the 1840s

before the rule under the Brookes colony, the existing Malay settlements concentrated at the south bank upriver from the Indian bazaar; by the early 1850s, some Malays moved across the river to the north bank, upstream from the Astana (Chon, 2000). The village stood as a self-contained village or neighbourhood with its own identity and structure based on family and social ties. The communities settle in houses built in a cluster pattern. The name is often named after the leader or sometimes the district of origin. This case study is *Kampung Bintawa Hilir*, a river village adjacent to the prominent Sarawak River. The studied site has been categorised as a traditional settlement urban design.

This research aims to identify and investigate the significant urban planning elements for paths, edges, districts, nodes, and landmarks (Lynch, 1960) of urban theories in *Kampung Bintawa Hilir* as a traditional urban design in Kuching. An urban element is essential in designing a city layout to influence a city's movement (Hassan, 2018). A good city planning layout will help the user be more understandable and precise whenever they move toward a destination (Hassan, 2017). Urban design helps with the design of towns and cities, streets, and spaces. It is the collaborative and multi-disciplinary process of interpreting and framing the physical setting for life in cities, towns and villages (Moughtin, 1999; Yao, 2018). Urban design involves building buildings and public spaces, infrastructure, and landscaping (Spreiregen, 1965). Urban planning is categorised into five types of urban elements: paths, edges, districts, nodes, and landmarks (Lynch, 1960).

2 Literature Review

2.1 Background of the Case Study

Kampung Bintawa Hilir is a traditional Malay village sited across the Sarawak River (Figures 1 & 2). It is one of the earliest Malay settlements in Kuching that existed in the 19th century during the Brooke era (Chon, 2000). The current *kampung* shows a high density of low-rise residential housing consisting of 700 houses, mostly one-storey houses. The residents are mostly low-income groups, and the ethnic background is mostly Malay (Utusan, 2019). Most *kampung* residents work as manual labour at the Pending Industrial Estate, located just across the river. Few own a small *sampan* would work as a fisherman or river taxi at the downstream of Sarawak River near Kuching Central Business District (CBD) to bring tourists across from one site to another (Ruekeith, 2010).



Figure 1: Key Plan (Kuching, Sarawak).



Figure 2 : Location Plan (Kampung Bintawa Hilir, Kuching)

2.2 Location of Case Study

The case study is located at the Kuching (Figure 1) North Land District adjacent to the Sarawak River (Figure 2). The river's geographical location allows them to have a small jetty, therefore using the river as one of the transportation routes and small trading and fishing activities. The topography of the site is generally flat and gradient slope towards the river. The site's condition is coastal lowlands comprising peat swamp mainly due to high annual rainfall and high-water table level (Sarawak-Government, 2018; Hassan, 1999).

2.3 Type of Urban Design: Traditional Settlement

Kampung Bintawa Hilir is a traditional settlement village (Figure 3). The village structure is similar to most traditional fishing villages consisting of jetties, small coffee shops, community hall, the marketplace, mosque, and school (Hassan, 1999). The village developed in the form of a parallel water village. It evolves parallel to riverbanks, estuaries, and coastal areas, following the site's topographical condition (Hassan, 2004). The houses were on the mudflats during the early time then the pattern is then further evolved in a parallel direction to the inland, therefore resulting having the pattern formed in a thin and lengthy shaped formation (Hassan, 1999; 2010).

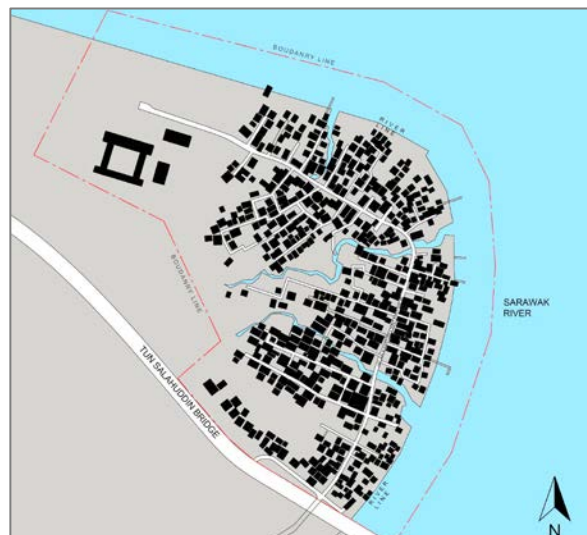


Figure 3: Ground Plan of Kampung Bintawa Hilir.

3 Research Method

This research paper applies the qualitative descriptive method to study the existing urban elements in *Kampung Bintawa Hilir*, Kuching. The five urban design elements based on *The Image of the City* (Lynch, 1960) are paths, edges, districts, nodes and landmarks. Qualitative research is defined as exploratory research to seek answers about the users' experience and perceptions through the site visits. These urban design elements have been measured through computation drawings CAD such as the cadastral plan and the survey plan from the local authority, Sarawak Land and Survey Department; and Google Earth to measure the particular elements' dimension and area. Comparisons are made to obtain the median readings as accurate as possible. The research limitation is caused by the Movement Control Order (MCO). Due to the current pandemic issue, this study could not carry face-to-face interview and site visits; instead, the surveys are done using

social media interviews and observing the site through Google Earth. Below is the measurable factors of five urban design elements – path, edges, districts, nodes, and landmarks:

3.1 Paths

Paths are the channels along which the observer moves. They may be streets, walkways, transit lines, canals and railroads. These elements often show the urban form's character and served as the backbone of urban street networks. The measurement quality of the path is identified by:

- a) The road size, particularly the width of the path including the road reserve
- b) The number of entrances along the path

The hierarchy of the road is determined by:

- a) The Primary path will have a broader road lane to accommodate more oversized vehicles.
- b) The Secondary path is accessed by smaller vehicles such as private cars and motorcycles.
- c) The Tertiary path will be the path for pedestrian's walk or bicycle access.

For ratio comparison, the measurements are taken:

- a) Measuring the length and width of the road, in the unit of the metre (m)
- b) The readings are converted into a percentage.

3.2 Edges

Edges are usually the perceived boundaries of separating two regions. It could be humanmade features in physical form such as road, bridges, building, tower, wall etc., or a way of transition and buffer such as natural landscapes – river, tree, bushes etc. The measurement quality of the edges is identified by the length and width of boundary across the site.

The hierarchy of the edges is determined by:

- a) The Main boundary edge will be the most dominant edge that is separating two regions.
- b) Secondary edge is the significant edge perceived by the local of how it is separating the area within the *kampung*.
- c) Tertiary edge will be least dominant and often perceived as a transition or buffer.

For ratio comparison, the measurements are taken by measuring the boundary's length and width, in the metre (m) unit and it is converted into a percentage.

3.3 Districts

Districts are the areas or sections of the city that recognised as having some common or identifying characteristics. The measurable factors of districts are determined by building usage and building form.

The hierarchical order is determined by:

- a) The primary district will cover an area of the site with common characteristics.
- b) The minor districts will have different features and smaller area coverage.

The result is obtained by measuring the area of districts in the unit of the square metre (m²) and percentage of the area coverage.

3.4 Nodes

Nodes are defined as the focal points within a city that are often junctions or areas where concentrate and attract people to gather as a distinct hub of activity. The factors in determining the quality scale of nodes are the type of activities that creates a concentration point in the site.

The hierarchy of nodes is identified by

- a) Primary nodes will have the highest level of concentration as a social hotspot.
- b) Secondary and tertiary nodes will comparatively have a minor level of concentration.

For ratio comparison, the measurements are taken:

- a) Through measuring the surface area, in the standard unit of the square metre (m²).
- b) The level of social and cultural activities.

3.5 Landmarks

Landmarks are often being recognised by the physical object that stands out and gives a sense of identity to the observers. The users use them as a point-reference to understand and see signs giving the sense of wayfinding (Bala, 2013). The measurable factors can be observed and identified by interviewing people regarding:

- a) The popularity of the objects used as a reference point to navigate through the site.
- b) Outstanding building function or form which can be seen from many directions.

The hierarchical order of the landmarks is measured by:

- a) Major landmark will have an outstanding level of dominance and popularity to be known by not only the local but also the outsiders,
- b) Minor landmarks will have a lower level of dominance and the popularity only restricted to the local people who stay nearby.

For ratio comparison, the measurements are taken:

- a) In the quantity of three-dimensional space, in the unit of volume, cubic metre (m³).
- b) The level of dominance through observation and perception of the observers.

4 Results of Analysis

This study refers to Lynch's theory in urban design elements: paths, edges, districts, nodes, and landmarks.

4.1 Paths

A path is a dominant element among the five elements (Lynch, 1960). The result shows that there are two ways to go inside the *Kampung Bintawa Hilir* from *Tun Salahuddin Expressway* and *Jalan Kampung Bintawa Tengah* (Figure 4). The overall hierarchical order is determined based on the number of entrances to the path as shown in Table 1.

Table 1: Comparison of all the road types in *Kampung Bintawa Hilir*

Path	Number	Width (m)	Total Width (m)	Percentage (%)	Length (m)	Percentage (%)
Highway or Expressway	1	30	30	11.63	3000	60.56
Arterial Roads	2	6	12	4.65	1400	28.26
Collector Roads	36	3	108	41.86	250	5.04
End Roads	36	3	108	41.86	3	0.09
Waterways	1	-	-	-	300	6.05
Total			258	100.00	4953	100.00

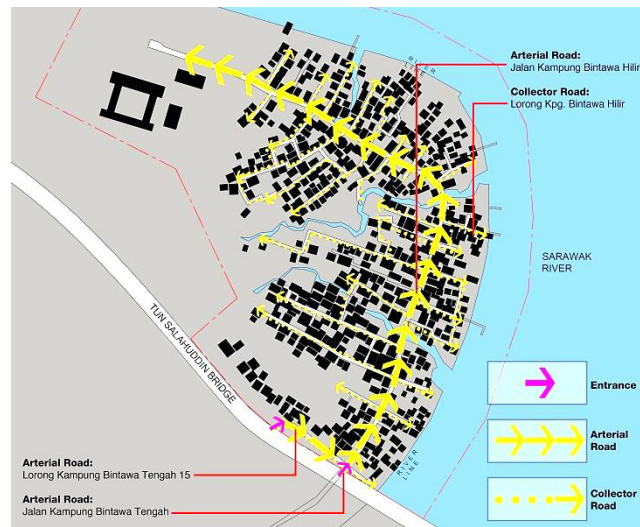


Figure 4: Paths in Kampung Bintawa Hilir, A main entrance starting from Lorong Kampung Bintawa Tengah 15 via Jalan Kampung Bintawa Tengah

4.1.1 Expressway

The *Tun Salahuddin Expressway* is considered a transition between north and south of Kuching city (Figure 5), and it is the only highway near the *Kampung Bintawa Hilir*. The villagers regularly travel via the *Tun Salahuddin Expressway* and via *Jalan Kampung Bintawa Tengah* where it is from another settlement for to and fro of the Kuching city. After travelling via *Tun Salahuddin Expressway*, a road connects to the arterial road and the collector road to access *Kampung Bintawa Hilir*.



Figure 5: *Tun Salahuddin Expressway* near the *Kampung Bintawa Hilir*

4.1.2 Ingress/Entrance

The *Kampung Bintawa Hilir's* main entrance (Figure 6) is via *Tun Salahuddin Expressway*, and the secondary entrance (Figure 7) is from *Jalan Kampung Bintawa Tengah*. Table 2 shows the width of entrance is about 6.70 meter and connected to the secondary road which it is called *Jalan Kampung Bintawa Hilir* where the width is about 6 meter all the way long until before the school compound which the road is becoming wider for better circulation and accessible for people sending their children to *Matu Baru Primary School*. There are about 36 tertiary roads with a width of about average of 6 meters connected to the private area where they are the villagers' houses. The tertiary road is starting from *Lorong Kampung Bintawa Hilir 1* until *Lorong Bintawa Hilir 36* near the school compound.



Figure 6: Main entrance of *Kampung Bintawa Hilir* from *Tun Salahuddin Expressway*



Figure 7: Secondary entrance of *Kpg Bintawa Hilir* from *Jalan Kampung Bintawa Tengah*

Table 2: Overall Entrances' comparative results

Path	Number	Width (m)	Total Width (m)	Percentage (%)
Main Entrance	1	6.70	6.70	4.83 %
Secondary Entrance	1	6.00	6.00	4.32 %
Tertiary Entrance	36	3.50	126.0	90.85 %
Total		16.20	138.70	100.00 %

4.1.3 Arterial Roads

The arterial roads (Figure 8) of *Kampung Bintawa Hilir* can be connected and sharing the same route with *Jalan Kampung Bintawa Tengah* and *Jalan Kampung Bintawa Hilir*. The width average of arterial roads is about 6 meters, including two-lane, which consist of two ways—a total of 1.14 km distance for arterial roads of *Jalan Kampung Bintawa Hilir*.



Figure 8: The end of arterial roads *Kampung Bintawa Hilir*

4.1.4 Collector Roads

The collector roads consist of *Lorong Bintawa Hilir 1* (Figure 9) until *Lorong Bintawa Hilir 36* and can be accessed from arterial roads *Jalan Kampung Bintawa Hilir*. Most of the width *Lorong Bintawa Hilir* is about an average of 3.5 meters, and it can fit with one car only.



Figure 9: The collector road of *Lorong Kampung Bintawa Hilir 2*

4.1.5 Waterways and River

The Sarawak River (Figure 10) is directly reachable from *Kampung Bintawa Hilir* jetty. The locals are vigorously promoted to either go across the river to the opposite waterfront or go to other neighbouring villages. This river allows several public modes of transportation to operate, like the water taxi and river cruise.



Figure 10: The Sarawak River and *Kampung Bintawa Hilir*

4.2 Edges



Figure 11: Edges of *Kampung Bintawa Hilir*

The edge is usually the boundary between two differential areas (Lynch, 1960). It is less noticeable by people who do not have a robust cognitive map of the site. There are three types of edges perceived by the localities in *Kampung Bintawa Hilir* – Shoreline Edge, Road Edge, and Canal Edge (Figure 11). The most dominant edge (Table 3) is the shoreline edge along the village's riverbank, and the total distance of the edges is about 1.35 km. A secondary edge is identified as the

road edge, a boundary created by *Tun Salahuddin Expressway*. The tertiary edges are the canal edges that the two canals within the site.

Table 3: Comparison on all the Edges in Kampung Bintawa Hilir

Edge	Number	Width (m)	Total Width (m)	Percentage (%)	Length (m)	Percentage (%)
Shoreline Edge	1	6	6	13.33	1350	21.42
Road Edge	1	3	3	6.60	1450	23.00
Canal Edge	2	3	6	13.33	500	7.93
Expressway Edge	1	30	30	66.74	3000	47.65
			45	100.00	6300	100.00

4.3 Districts



Figure 12: Figure-Ground Layout Plan showing the Districts of Kampung Bintawa Hilir

From the study (Figure 12), there are two (2) main types of districts in *Kampung Bintawa Hilir* – a Residential district and an Institutional district (locals refer to as a School district). In contrast, the residential district is further detailed into the Landed house and Stilts house district. These districts are differentiated based on building usage and building form. The hierarchical order is determined based on the size of the districts (Table 4).

Table 4: Percentage of all Districts' areas of Kampung Bintawa Hilir

District	Area (m ²)	Percentage (%)	Hierarchical Order
Landed House District	151,755.80	48.00	Primary
Stilts House District	90,313.43	28.54	Secondary
Institutional District	37,928.24	12.00	Tertiary
Open Green Space	36,176.52	11.46	Minor
Total	316,176.99	100	

4.3.1 Primary District – Landed House District

The localities refer to the landed house district as the most dominant district. The houses are built with a zinc roof and brick-wall with a concrete base on the firm ground.

4.3.2 Secondary District – Stilts House District

Across the road is the stilts house district which most of the houses are built on stilts due to high water table and swampy soil to prevent floods and tides from time to time.

4.3.3 Tertiary District – Institutional District

A small parcel of land has been used as an institutional district that is considered the least dominant district in *Kampung Bintawa Hilir*. The land is reserved for building educational and

communal facilities, such as *Matu Baru Primary School (SK)* and clinics (*Klinik Kesehatan Ibu Dan Kanak-Kanak*).

4.4 Nodes



Figure 13: Ground Layout Plan showing nodes around *Kampung Bintawa Hilir*

According to Kevin Lynch (1960), nodes are the strategic focal points that are generally perceived as junctions of roads. This space bifurcates and connects paths to different directions and also open spaces such as plazas (Figure 13). There are four (4) types of nodes in *Kampung Bintawa Hilir* – Traffic Node, Religion Node, Commercial Node, and Activity Node. The hierarchical order is determined by the level of socio-activity of the nodes (Tables 5 & 6).

Table 5: Type of Nodes with percentage and level of socio-activity

Node	Size (L x W) (m)	Area (m ²)	Percentage (%)	Activity Type	Level of Socio-Activity
Traffic Node	22 (radius)	1,515	13.2	Traffic	Good
<i>Majlis</i> Node	24 (radius)	1,890	16.5	Religion	Satisfactory
Commercial Node 1	80 x 18	1,440	12.6	Commercial	Weak
Commercial Node 2	40 x 33	1,320	11.5	Commercial	Average
Sports Node	110 x 48	5,280	46.2	Sports	Very Good
Total		11,445	100		

Table 6: Likert scale of Nodes' socio-activity level

Likert Scale	Remarks
Very Good	Open space that is creating a high level of concentration of human and traffic and used by the local every day
Good	Space that frequently used and creating a gathering hotspot at a particular time.
Satisfactory	A point that has a medium concentration level of gathering spot
Average	Space that shows a low level of concentration level and only accessed by the local at a particular time
Weak	Space that has a low concentration level and is seldom used by the locals. Space is only used by the local once in a while

4.4.1 Primary Node – *SK Matu Baru's* football field (Sports Node)

The most significant node perceived by the local people is the *SK (Primary School) Matu Baru's* football field, serving as an activity-based node. The football field is opened not only for school activities but also for the public; therefore, it creates a concentration point every evening to become a place for everyone in the *kampung* to do sports.

4.4.2 Secondary Node – Road Junction at *Kampung Bintawa Hilir*'s entrance (Traffic Node)

The secondary node was at the junction of *Kampung Bintawa Hilir*'s entrance. The junction is the only ingress and egress for the entire *kampung*, forming a traffic node, especially during peak hour in the morning and evening.

4.4.3 Tertiary Node – Open terrace at *Masjid Darul Islam* (Majlis Node)

Masjid Darul Islam becomes a tertiary node. It is a religious node due to the active religious activities around that area. People often gathered at the terrace area in front of the main prayer hall.

4.4.4 Minor Nodes – *Krispy Naggrey* stall (Commercial Node 1) & *D'Zulila* café (Commercial Node 2)

Minor nodes are mostly commercial nodes – *Krispy Naggrey* roadside stall (Commercial node 1) and *D'Zulila* café (Commercial node 2). Both commercial nodes are selling Malay food, *D'Zulila* café has a bigger crowd than the roadside stall because of having a bigger space for seating and more food varieties.

4.5 Landmarks



Figure 15: Figure-Ground Layout Plan showing landmarks around *Kampung Bintawa Hilir*

Figure 15 shows that there are three (3) landmarks in *Kampung Bintawa Hilir* – two (2) religious landmarks and one (1) institutional landmark. The landmarks are recognised by the people's popularity, not only from the localities and outsiders but also from the point of reference. Its level of dominance determines the hierarchical order of the landmarks (Tables 7 & 8).

Table 7: Types of Landmarks and the level of dominance

Landmark	Length (m)	Width (m)	Height (m)	Area (m ²)	Volume (m ³)	Level of Dominance
Religion Landmark 1 (Masjid Darul Islam)	30	28	6	840	5,040	Good
Institutional Landmark (SK Matu Baru)	92	75	10	3,900	39,000	Very Good
Religion Landmark 2 (Surau Darul Iman)	24	17	7	408	2,856	Satisfactory

Table 8: Likert scale of Landmarks' dominance level

Likert Scale	Remarks
Very Good	An outstanding structure that is well known by the locals and outsiders; has always been used as a point of reference; discernible from distant
Good	The locals use the landmark as a point of reference; visible at a certain distance.
Satisfactory	The landmark that only known by the residents staying nearby.

4.5.1 Primary Landmark – *SK Matu Baru* (Institutional Landmark)

The most dominant landmark shown in *Kampung Bintawa Hilir* is *SK Matu Baru*, an institutional landmark that is identifiable because its scale and architectural form differed from its surroundings. It is a landmark not only recognised by the local people but also by the outsiders of how they locate *Kampung Bintawa Hilir*.

4.5.2 Secondary Landmark – *Masjid Darul Islam* (Religion Landmark)

The secondary landmark is *Masjid Darul Islam*, a religious landmark that the people from the *kampung* well-known. It is identical and visible from a certain distance due to its distinctive Islamic architectural element.

4.5.3 Tertiary Landmark – *Surau Darul Iman* (Religion Landmark)

The tertiary landmark is *Surau Darul Iman*, a religion landmark that only known by the nearby residents due to its subtle location. However, the observers can distinguish it from its octagonal-roof architectural feature.

5 Discussion

5.1 Paths

The path of the site is peculiar and clear to guide the visual perception in urban spaces. The clarity of the paths, both road, and river, lead to precise mental imaging due to its proper sizing for arterial road and collector road. The most peculiar is the collector road (*Jalan Kampung Bintawa Hilir*) with a 6-meters width. *Jalan Kampung Bintawa Hilir* act as a transition between the arterial road makes it high in demand for movement around the site. As for the weakest path, the collector road located on the east side of the site connecting arterial road from *SK (Primary School) Matu Baru* to *Kampung Bintawa Hilir* due to its irregular width and weak visual perception. The usage is less with the only usage limited to villagers.

5.2 Edges

Edges are considered the second most dominant of the five urban design elements in this study area of *Kampung Bintawa Hilir*. The study area has a satisfactory edge element as easily perceived by locals. The predominant edge is the watercourse edge. The Sarawak River stretches across 1.14km and forms a boundary between land and water. Besides being the borderline for the villagers to disembark from the riverfront transportation, it also influences the villager's development structure as it progresses. The weakest edge within the study area is *Jalan Kampung Bintawa Hilir* which separates *Kampung Bintawa Hilir* from the neighbouring village. There is also a vegetation boundary that acts as divisions between two districts, educational and village districts.

5.3 Districts

The most dominant district element is identifiable by the traditional district pattern in *Kampung Bintawa Hilir* perceived by the localities. The primary district is the landed house district which covers the most significant area of the total site, mainly due to the *Kampung Bintawa Hilir* area is a traditional settlement, and the locals gather and build houses themselves, therefore, the residential district has dominated a significant portion of the site since the early settlement. The least dominant district is the institutional district. This district covers a small portion of the total site, and it is a new district as compared to the other two districts which have just been developed since 2011 with schools (*SK Matu Baru*) and clinics (*Klinik Kesihatan Ibu Dan Kanak-Kanak*) to upgrade the basic amenities of the *kampung*.

5.4 Nodes

The nodes at *Kampung Bintawa Hilir* are considered to be weak compared to other urban design elements. The quality of measurable nodes is not easily identified through observation but mostly perceived by the observers and localities. The most significant node in the *kampung* is the activity node - an open football field in *SK Batu Maru* because of its high socio-activity level. People usually hang around the area for leisure and sports activities throughout the day. The least significant node is a local stall's commercial node along the roadside, *Krispy Naggrey stall*. The place lacks elements that could create a concentrated gathering point for customers such as tables and chairs for seating or any covered open space to provide shade. Therefore, this commercial node is comparatively less successful than the other commercial node - *D'Zulila Cafe*, a small eating place that allows people to hang out.

5.5 Landmarks

The overall result is at a satisfactory level in showing the urban design element. *Kampung Bintawa Hilir* has three landmarks that are perceived by the localities. The most prominent landmark is *SK Batu Maru* due to its popularity and building scale, visible and identifiable from a distance. The building's distinctive contemporary outlook has made itself stand out from other traditionally built houses around that area as a vital urban element in the *kampung*. The least prominent landmark is *Surau Darul Iman* that has the least popular due to its subtle location and only known by the localities.

6 Conclusion

Throughout the study, the quality of the urban design elements for *Kampung Bintawa Hilir* has been identified as dominant with district and edges elements that influence the path pattern. The overall result of all urban design elements is considered medium in the dominance of showing Kuching urban design. The highest and distinctive urban elements in *Kampung Bintawa Hilir* is the district element. The district pattern can be distinguished and influencing the path pattern within the site. An example of a good district pattern is that the buildings with the same function and similar architectural features are allocated simultaneously, thus forming a district.

On the other hand, the node is the weakest urban design element, mainly because it is not easily identifiable through observation as other urban design elements. The studied area does not equip a significant node that could create a district's focus and epitome. Examples of weak nodes are traffic nodes and commercial nodes which do not play crucial roles in defining *Kampung Bintawa Hilir*. Recommendations to improve the node are to create open space at the centre of the district that is easily accessible by the localities. It is to create a concentration point that stands out with socio-activities that highlight the kampung's identity.

We have encountered a few limitations and restrictions while conducting the study. One of the limitations is that we cannot carry out site visits in person due to the current pandemic issues and Movement Control Order (MCO) implemented by the government and observe the site through Google Street. Face-to-face interviews are also limited and forced to be done by social media. In short, *Kampung Bintawa Hilir* is a traditional settlement that shows the planning and urban network fulfills the five urban design elements studied for this paper. However, due to the Darul Hana project's development, the *kampung* residents will soon be asked to relocate and move out of the village. We hope the government could preserve the village with a well-planned development plan to upgrade the village rather than demolish the whole area to give way for the development project. This proposal ensures the existence and sustenance of traditional Malay settlements and their cultural identities in Kuching Sarawak.

7 Availability of Data and Material

The generated data and the result of this study are available upon request to the corresponding author.

8 Acknowledgment

The authors express their sincere appreciation to the Universiti Sains Malaysia to support this study under a Bridging Grant, Number 304.PPBGN.6316521.

7 References

- Chon, H. A. (2000). *Kuching in Pictures 1841-1946*. Kuching: See Hua Daily News Bhd.
- Hassan, A. S. (1999). Corak Penempatan Perumahan Tradisional Berkepadatan Tinggi. *Journal of Housing, Building and Planning*.
- Hassan, A. S. (2004). Sustainable Future Urban Patterns and Socio-economic activities of Tropical Wetlands in Southeast Asia. In S. Sassen, *Human Settlement Development: The Central Role of Cities in our Environment's Future-Constraints and Possibilities*. Oxford, UK: Eolss Publishers.
- Hassan, A. S. (2010). Fishing Villages Resemblance of Pre-colonial City Landscape at the Straits of Malacca in Peninsular Malaysia. *The Arab World Geographer*, 93-107.
- Hassan, A. S. (2017). *Amalan Tebus Guna Tanah, Reka Bentuk Bandar dan Seni Bina di Malaysia*. Penang: USM Press.
- Hassan, A. S. (2018). *Ke Manakah Hala Tuju Reka Bentuk Bandar dan Seni Bina Kita?* Penang: USM Press.
- Lynch, K. (1960). *The Image of The City*. The M.I.T Press.
- Moughtin, C. (1999). *Urban Design Methods and Techniques*. Boston: Butterworth-Heinemann.
- Ruekeith, G. O. (2010, April 28). River Taxi System could be Tourist Draw. Kuching, Sarawak: Borneo Post.
- Spreiregen, P. (1965). *Urban Design: The Architecture of Towns and Cities*. New York: McGraw-Hill.

Utusan-Borneo. (2019). *Penduduk Bintawa perlu diutamakan pindah ke Projek Pembangunan Darul Hana*. Kuching, Sarawak: Utusan Borneo. <http://www.utusanborneo.com.my/2019/02/02/penduduk-bintawa-perlu-diuatama-pindah-ke-projek-pembangunan-darul-hana> Retrieved February 2019.

Yao, W. Y., A. S. Hassan, K. A. K. Hassan, and M. Ismail. (2018). Accessible Circulation and Movement in Building: Case Study of Stesen Sentral Kuala Lumpur. *International Transaction Journal of Engineering Management & Applied Sciences & Technologies*, 9(4), 221-238.



Mohd. Anis Yaziq bin Alimin is a Master's degree student of Architecture at the School of Housing, Building and Planning, Universiti Sains Malaysia (USM), Penang, Malaysia. He obtained his Bachelor of Science (Hons) degree in Architecture at the School of Housing, Building and Planning, Universiti Sains Malaysia (USM), Penang, Malaysia.



Chan Lek Heng is a Master's degree student of Architecture at the School of Housing, Building and Planning, Universiti Sains Malaysia (USM), Penang, Malaysia. He obtained his Bachelor of Science (Hons) degree in Architecture at the School of Built Environment, University College of Technology Sarawak (UCTS), Sarawak, Malaysia.



Professor Dr Ahmad Sanusi Hassan is a lecturer in Architecture Programme at the School of Housing, Building and Planning, Universiti Sains Malaysia (USM), Penang, Malaysia. He obtained his Doctor of Philosophy (PhD) degree from the University of Nottingham, United Kingdom. His research focuses on Sustainable Architecture and Urban Design Development for Southeast Asia, history and theory of Architecture, Computer-Aided Design (CAD) and Computer Animation.



Dr Yasser Arab is a Researcher in Architecture. He obtained his Bachelor of Architecture from Ittihad Private University, Aleppo, Syria. He obtained a PhD. in Sustainable Architecture from Universiti Sains Malaysia (USM), Penang, Malaysia, his research focused on the Environment Performance of Residential High-Rise Buildings' Façade in Malaysia. He is a Registered Architect in the Syrian Engineers Union.



Dr B. Witchayangkoon is an Associate Professor of Department of Civil Engineering at Thammasat University. He received his B.Eng. from the King Mongkut's University of Technology Thonburi with Honors. He got a PhD in Spatial Information Science & Engineering from the University of Maine, USA. Dr Witchayangkoon interests involve Applications of Emerging Technologies to Engineering.



Dr Joesron Alie Syahbana is an Associate Professor in Department of Urban and Regional Planning, Faculty of Engineering, Diponegoro University-Semarang-Indonesia. He also as the Promotor (Dissertation Supervisor) of Sunarti. He has research focused on Community Based Management, Qualitative Method And Urban Planning.

Note: The origin of this article was reviewed, accepted, and presented at the 5th International Conference on Sustainable Architecture and Urban Design (ICWSAUD 2020) (Virtual Conference), a Joint Conference with the 5th International Conference on Engineering, Innovation, & Technology (ICEIT 2020) held by the School of Housing Building and Planning, Universiti Sains Malaysia, Pinang, Malaysia during 22-23 September 2020.