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Strategizing the Methodology in Assessing Malaysia's Heritage Urban River Corridor Landscapes

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Strategizing the Methodology in Assessing Malaysia's Heritage Urban River Corridor Landscapes

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Abstract. The river corridors of Malaysia's heritage river cities have long been contributing to the livelihood of diverse communities within these places. Recently, the speedy city development progress in Malaysia to accommodate the up to date cultural-based heritage economy, coupled with severe climate change and lack of community consultation in designing and developing the river corridors has made a difference to the landscape settings of these places. These have raised concerns among the local community, particularly the local workers who are depending on the resources along the river corridors. This paper explains the strategy in triangulating multiple research methods to identify and assess the important landscape character settings of Malaysia's urban river corridors, which are significant in the routine of the working communities at these places. The experiential landscape survey (ELS) - the phenomenological approaches in landscape assessment created by Thwaites and Simkins was tested. Three inter-connected processes that consist of Process 1 – defining preliminary river corridor boundaries, Process 2 – looking for relevant occupations and individuals (as participants), and Process 3 – identifying and assessing the significant landscape setting successfully strategized in this study. The outcome helps to assess the landscape character in relation to working communities' experience for heritage urban river corridors in Malaysia. It also expands the conventional landscape character assessment through multiple methods, including site observation, ELS, and interviews.

Keywords: river corridor, experiential landscape, heritage cities, working communities, Malaysia, Melaka City, Kuala Terengganu

1. Introduction

The Riverfront Development Guidelines [1] defined a river corridor in the Malaysian context as, "the river, including the area extending fifty (50) meters beyond the river reserve on both sides" (Figure 1). The definition clearly emphasized the condition of river corridor in form and position, with less information on the ecological and dynamic characteristics, which are essential to define the primary territory of these strips of land along river channels.

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Figure 1. Urban river corridor territory according to the Department of Irrigation Malaysia (Source: adapted from [1])

A natural river corridor landscape is complex and it is tough to determine its boundary, as the river corridor territory can include various landscape settings and living systems connected to a complex river system [2–4]. A developed river corridor in different is significant as it offers more resources for urban communities to support their socio-economic, social, cultural and urban ecological needs in the contemporary living environment. Yet there is an outdated understanding among urban design teams (especially those between 1990s and early 2000s) that river corridors in Malaysia, generally, are just similar. This is reflected from their response in regards to the standard design and development applied in almost all of the urban river corridors and riverfront properties in this country. The disregard for the ecological characteristics of river corridors in the design process, combined with lack of enforcement in the design outcomes have resulted in many urban river corridors in Malaysia to be unsustainable and in an inferior standard of quality.

Recently in Malaysia, there is an awareness among urban managers and urban design teams to enhance the quality of the urban river landscape. This is because most of the urban river corridors are deemed as important and valuable assets to the urban community from diverse socio-economic and multi-ethnic backgrounds. Unfortunately, there are limitations to the current approaches in looking for the main stakeholders whose livelihood and working routine are depending on the values offered by the urban river corridors. Yet, their uncommon experience and understanding of the river corridors can assist the urban design teams in developing a better design outcome for community's important landscape settings. Urban design teams, therefore, need a powerful method to assist them in acquiring community consultation and public participation to gain insights into the important landscape settings among the community. This paper attempts to discuss the inter-connected processes developed and strategized for this study. Qualitative methods were chosen to assess the vital landscape character settings of the selected urban river corridors, as distinguished by the working communities of Malaysia's heritage river cities. The processes utilized are useful to strengthen the landscape design process for the river corridor landscape development in these cities.

2. Methods

This study adopts the experiential landscape concept - a phenomenological technique in the landscape character assessment (LCA) created by Thwaites and Simkins [5] to identify the landscape settings that are crucial in influencing the routine among working communities of the urban river corridors in heritage river cities of Malaysia. The experiential landscape concept consists of these elements – center, direction, transition and area [5]. Therefore, this study attempts to evaluate the people's important landscape settings according to the local context.

2.1 Research areas

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Two urban river corridors in two prominent heritage river cities of Malaysia were chosen for this study. One is located at Melaka City while another one is situated at Kuala Terengganu (Figure 2, 3 and 4). The selection of these areas is based on the following criteria:

- They have significant growth in terms of historical, ecological and physical development contexts;
- they are a living niche for the local communities, who come from various cultures and socioeconomies;
- the rivers in these cities are outstanding in influencing the physical, social and cultural development for the research areas; and,
- they have similar characteristics in terms of:
 - situated in historic cities and geographically located at an estuary area;
 - in the jurisdiction of the city council;
 - experienced expiditious urbanization, cultural-based development and active tourism-oriented development; and,
 - possessed established river corridor design, development, and management activities.



Figure 2. The research areas in Peninsular Malaysia, as shown in red dots: (1) Melaka City and (2) Kuala Terengganu (Source: [6])



Figure 3a & 3b. The research area at urban river of Melaka City (left) and Sungai Melaka's river system (right) (Source: [7,8])



Figure 4a & 4b. The research area at urban river of Kuala Terengganu (left) and Sungai Terengganu's river system (right) (Source: [7,8])

This study involved two stages of fieldwork activities, each stage was designed with different aims.

2.2 Stage 1 Fieldwork

The Stage 1 fieldwork is aimed at identifying relevant occupations in terms of working scopes, activities, and routines that are related to the sources offered by the urban river corridor landscape in Melaka City and Kuala Terengganu. This stage also aims to distinguish and select relevant individuals who are involved in the identified occupations before inviting them to participate in this study. This study had also gathered information from the Internet and on-site to achieve the aims of Stage 1 fieldwork. Information drawn from this stage was used to construct two primary tools for the study, which are further used to support data collection activities in Stage 2 fieldwork, involving ELS and semi-structured interview sessions.

2.2.1 Exploring and gathering information via the Internet and local publication. This study has used the Internet and local publications as the primary medium to explore the site since the researcher involved is an outsider and had little understanding about the condition in the research areas. Google Earth, Flickers, Facebook, blogs, websites and Instagram provide free access to satellite images, image-based social media networks and web resources, to be used as the reference for online site exploration. With the abundant resources from the Internet, the significant areas in terms of physical and cultural aspects (exposed to the public and promoted online) within the heritage urban river corridors were identified. The online exploration has helped the researcher make reflection and understand the condition of the research areas from the surface. Also, this has assisted to get prepared prior to the next exploration stage, need to be done on site.

2.2.2 On-site exploration and familiarization. In the next stage, this study involved on-site exploration and familiarization activity. The the research areas are unique. Therefore, the areas need to be explored intensively to support the familiarization activity within the heritage urban landscapes. Some types of equipment were made ready to aid the on-site tour and familiarization attempt in both research areas:

- Site map with the up-to-date information;
- Data recording equipment such as Nikon digital camera, cam-corder, Sony voice recorder, broadband, fieldwork checklist, notebook, stationeries, and appropriate clothing attire for conducting survey works;
- Itinerary for survey activities; and,
- Personal transportation and assistants.

In this stage, various transportation modes were utilized, including walking, driving, and using public transport available on sites, such as river cruise boat and trishaw.

2.3 Stage 2 fieldwork

The Stage 2 fieldwork was more focused on strategizing process to identify and assess the landscape settings of the research areas using two survey techniques; ELS and interview.

2.3.1 *Experiential Landscape Survey (ELS).* ELS involves touring and scrutinizing the participants' experiential landscape in their working ground in order to seek and evaluate the landscape settings that play a part in their earning. ELS was conducted to follow their journey based on their working routine at their urban river corridor ground.

2.3.2 Semi-structured Interview. This approach is used to look into the relationship between studied working communities and their living landscape [9,10]. Five sets of questions were designed for the interview to gain insights into five working community groups in Melaka City and Kuala Terengganu. The participants were selected among the insiders who have been working for a living there. They were also chosen from diverse occupation background (from professional to general worker level) where the nature of their job routine has a significant relationship with the river in the research areas. They are

urban manager, city journalist, tourist guide, boat skipper and rickshaw puller. The questions were developed in Malay and English languages to cater to their native tounge preference. This study employed thematic coding, open coding and map overlay in analyzing the interview feedbacks and ELS data to identify the crucial settings based on the experiential landscape theory.

3. Outcomes

There are three inter-connected processes that are successfully strategized in this study has, as part of the processes to assess the working communities' important landscape character settings:

- Process 1 Strategizing online exploration activities
- Process 2 Strategizing Stage 1 fieldwork activities
- Process 3 Strategizing Stage 2 fieldwork activities

3.1 Process 1 - Strategizing online exploration activities

Five activities were outlined in this process, to assist in defining the preliminary research boundary of the urban river corridor sites in Melaka City and Kuala Terengganu (Figure 5). Online exploration activities were conducted from a distance, which is a unique yet critical process. Since the researcher is not familiar and has limited access to both areas, this process contributes to the development of the next processes.



Figure 5. Process 1 - Strategizing online exploration to develop and define the preliminary research boundary of the studied urban river corridors in Melaka City and Kuala Terengganu.

The boundary in this study was established to the areas where the research participants (urban design team and special interest individuals) with relevant occupations were found. The defined research areas show that the heritage urban river corridor landscapes in Melaka City and Kuala Terengganu are unique, and thus require intensive exploration that is deemed practical in both areas.

3.2 Process 2 - Stage 1 fieldwork activities

3.2.1 Strategizing Stage 1 fieldwork activities. Process 2 - the stage 1 fieldwork 1 is to guide in identifying the individuals with relevant occupation as the research participants within the defined research areas. It is also for the researcher to explore, discover, and get familiar with the working routine of the locals in the dynamic and complex urban river corridor landscape (Figure 6). The initial findings were obtained from two groups; i) urban design teams and ii) special interest individuals.

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Figure 6. Process 2 - Finding individuals with relevant occupations as the research participants

There are four activities in Process 2 that cover the durations before, during and after fieldwork activities; i) to define purpose, scope and prepare for the field work 1; ii) the first impression of the research sites; iii) field exploration and familiarization to identify appropriate occupations and, iv) to identify relevant participants.

 $3.2.2 \ Process 2 - Stage 2 - First impression of the research sites.$ In Stage 2, the researcher recorded her impressions of the views, ambiance, reactions, ideas, feelings, and understanding of the place (research areas) during the first visit, using the landing approach by Girot [11]. The landing technique is necessary because it makes use the researcher's experience as an outsider of the places, as an expertise (the researcher background as a landscape designer), and the researcher's sense of curiosity about the place during the first visit, The purpose is to identify the indicators of places that are regarded as the centre of outdoor workplaces, which are to the working communities, especially the urban design teams and special interest public.

3.2.3 Process 2 - Stage 3 – Site exploration and familiarization to track down appropriate occupations. Stage 3 involves critical site exploration, observation, and familiarization activity with the defined working communities working ground. The purpose is to track down appropriate occupations as well as individuals among the urban design teams and special interest groups as the research participants. The researcher identified the urban river corridors locations and characteristics that are deemed significant for the participants to earn their livelihood. In stage 3, this research applied grounding, finding and founding techniques introduced by Girot [11]. The research participants are the individuals who are knowing well the study sites and have active working routines within the study areas. The criteria to select the relevant participants are as follows:

Urban design team members:

- currently attached to the city council as part of the urban design team in the research areas; and,
- involved as decision makers in developing the urban river corridor landscape within the research areas.

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Special interest public members:

- actively operating within the research areas (either at Melaka City or Kuala Terengganu);
- who are familiar with the research sites; and,
- in contact with the public in particular places through their daily working routine activities.

3.2.4 Stage 4 – Identify the relevant research participants. This stage involves finding and selecting the most appropriate insiders of the occupations as participants based on the below criteria:

- have significant work experience abd achievement in their field; and,
- possess broad proficiency of their landscape settings based on the relationship they have with the research areas via their working routine.

Ten insiders (five participants for each research area) representing the identified occupations were found to be the most appropriate participants. They have been suggested by their colleagues. Overall, this process enables the identification of:

- the ground centre for the working communities;
- relevant occupation; and,
- competent individuals (from the discovered occupations) as research participants.

3.3 Process 3 – Strategizing Stage 2 fieldwork activities

Process 3 is to find and evaluate the landscape settings via four main activities: i) to design experiential landscape survey (ELS); ii) to develop ELS brief description and to arrange a tour; iii) to administer ELS with the participants; and, iv) to classify and describe.



Figure 7. Process 3- Indicating and evaluating the important urban river corridor settings with the identified research participants.

3.3.1 Stage 1- Strategize ELS. ELS was used as the main approach to reinforce Stage 2 fieldwork. The field study would be conducted by identifying participants with the actual outdoor working ground in river corridors of the research areas. ELS involves touring and studying the participants' experiential landscape within their working range to discover and evaluate the landscape settings that important and have contributed to their earning. Interview questions for ELS were provided to escort their journey

based on their working routine at the studied areas. This is matching with the concept of experiential landscape in investigating and scrutinizing human experience in a landscape because based on Thwaites and Simkins, "this is the reality of how places are experienced" [5].

The tools used to support the ELS approach are:

- a) interview questions, base map as well as tape/video/recording devices; and,
- b) ELS protocols sets of rules in the survey, established to facilitate the survey activities that cover three sessions; before, during, and after the ELS activities.

3.3.2 Stage 2 – Organize briefing session and planning ELS journey with the participants. At stage 2, the researcher arranged a briefing session with each of the participants before undertaken the survey activity according to their preferred schedule. A set of ELS tools that consist of protocols, semi-structures interview questions, consent form, and the site base map was been given to them during the meeting. The tools did also help in giving some ideas to them about how ELS activity will be conducted and types of data that need to be obtained. The participants have also been requested to propose the ELS tour according to the exact journey that they have been taken while conducting their job in the studied area.

The session at this stage allows the researcher to:

- uncover the participants' sense of interest and capabilities, whether they are keen to be committed in the survey or not;
- gain introductionary information about the places; and,
- obtain a preliminary tour plan designed by the participants based on their daily job routine at the urban river corridors in these cities, as well as the recommended transportation modes for the ELS activity.

3.3.3 Stage 3 – Conduct ELS with the participants. Stage 3 involves conducting ELS and interviews to find and evaluate the landscape settings at the urban river corridors deemed important by the participants. Most of the sessions were conducted in Malay.

3.3.4 Stage 4 – Classify and describe. Stage 4 involves arranging and mapping the landscape settings that important to the participants according to the experiential landscape characteristics developed by Thwaites and Simkins [12]. The characteristics that emphasize values and meanings of the settings were revealed and described by them. Three categories of analyses were undertaken including thematic analysis, mapping and general map overlay, and open coding. Overall, Process 3 leads to the main findings of this research:

- the best to the slightest landscape settings which are outstanding and momentous to the working communities;
- the settings' characteristics;
- the usefulness and intrepitation of the settings from the working insider communities' perspective and experience with these places;
- the distribution of working insider communities' important urban river the settings.

4. Discussion

This study has successfully strategized and undertaken three processes in evaluating the working communities' relevant landscape character settings of the urban river corridors via human experience as shown in Figure 8.



Figure 8. The flow of the three major methodological processes for this research.

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This study also demonstrates that the triangulation of multiple techniques is significant in supporting the assessment process as highlighted in Figure 9. Observation, exploration, and interview are the main procedures conducted by the researcher were used to define the research area preliminary boundaries. Observation and interview approaches were further used to identify the individuals with relevant occupations as research participants. Meanwhile, ELS is the primary technique, which is based on the evaluation of key users (represented by the research participants as the working communities) was applied to appraise the essential urban river corridor settings from the users' experience.



Figure 9. The main idea of the multiple method triangulation used in the assessment.

In general, the assessment processes have further advanced the conventional landscape character assessment (LCA). This study has engaged stakeholder participation covering extensive areas of the urban river corridors. The locals are highly included in assisting the expert in understanding their important landscapes. This research has also found the diverse working communities who have worthwile experiences and unique knowledge of what is relevant in the urban river corridor settings, which worth to consider in supporting urban design team's design decision making.

5. Conclusion

The development of the processes involved in this study has further extended the landscape character assessment (LCA), by factoring in community feedback to enhance the recent landscape design for the forthcoming development of urban river corridor in Malaysia. Indeed, this study has come out with a new approach for the Malaysian urban design teams to evaluate the landscape settings that are crucial yet significant for diverse working communities via experiential landscape survey (ELS). In particular, this study reveals the working communities' reliance on the landscape character to earn a living in the urban river corridors of the heritage cities.

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Challenges for Community Based Rural Tourism Continuity and Resilience in Disaster Prone Area: The Case of Mesilou, Sabah

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Abstract. There is no doubt that the tourism sector has become one of the major contributors to development and considered as agent of change for many parts of the world. The strengths of tourism (or community based rural tourism, CBRT in this context) are described in various forms; as a tool in economic and physical development and as means to enhance the social and human capital development and conservation of natural environment. In rural areas especially in developing countries, tourism development had been eagerly embraced as a panacea for revitalising the rural economy, hence many government agencies, particularly tourism-related bodies, have also invested heavily to promote more sustainable forms of community-based tourism in rural areas. Under normal situation i.e. where CBRT is operated outside disaster prone areas or with notion of less considerations on reducing disaster risk in operating a tourism business, CBRT might flourish in rural areas, and in return would be able to secure local job creation, stable income generation, curbing outmigration among youths and workers, protecting natural resources and local culture, etc. As for CBRT programmes which are operating in disaster-prone areas, their operators might not share similar opinions as they have to cope with different issues and challenges, which in this context, challenges in generating sufficient income for sustaining their operation and also in reducing disaster risk and potential losses to their business. This paper will discuss possible challenges in sustaining CBRT programmes in disaster-prone areas based on the findings from data analysis of a case study of homestay operators in Mesilou Village in Sabah, Malaysia, particularly after the 2015 earthquake.

1. Introduction

Extreme climate, rapid urbanization, and environmental degradation substantially increase our exposure and challenges to natural hazards and disaster risk particularly in developing tropical countries. With the spirit underlying the Sendai Framework on Disaster Risk Reduction 2015-2030 adopted in the United Nations General Assembly 2015, this paper presents a community-based platform for disaster risk reduction (DRR) emphasizing on empowerment and sustainability of community based tourism business in facing those emerging challenges. The development of community based rural tourism (CBRT) was an outcome of the federal government's to strengthening household income through diversified the rural economic activities, since agriculture sector alone is no longer holds the key to rural development [1,2].



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Under this initiative, a more sustainable form of tourism is being promoted in rural areas, with government heavily investing into infrastructure development, training and promoting of CBRT. These efforts have in turn, being supported and eagerly embraced by communities involved as a panacea for revitalising the rural economy [3].

Operation of any CBRT particularly under normal situation i.e. tourism that operated outside disaster prone areas or with the notion of lesser need for reducing disaster risk in a tourism business, might flourish in rural areas and will foster local job creation, stable income generation, curbing outmigration among youths and workers, protecting natural resources and local culture, etc. However, the operators of CBRT programmes in disaster-prone areas, might not share similar opinions as they have to cope with different issues and challenges; which in this context, challenges in generating sufficient income for sustaining their operation and also in reducing disaster risk and/or potential losses to their business. This paper will discuss possible challenges in sustaining CBRT programmes in disaster-prone areas based on the findings from data analysis of a case study of homestay operators in Mesilou Village in Sabah, Malaysia, particularly after the 5th of June 2015 earthquake.

2. Community Based Rural Tourism in Disaster Prone Area

2.1 The nature of CBRT

Ever since the concept of sustainable development came into the development and conservation debate, many government agencies, particularly tourism-related bodies, have invested heavily to promote more sustainable forms of tourism in rural areas. The term 'sustainable tourism' has come into tourism literature as an extension of the idea of sustainable development, but with more focus on tourism needs – "a tourism development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [2]. What is Rural Tourism? At first glance, a simple answer can be given: rural tourism is tourism, which takes place in the countryside [4]. The reality of rural tourism, however, is more complex as many early commentators have pointed out on deeper consideration where a simple definition of rural tourism is inadequate for many purposes [2,5]. Equally, it is difficult to produce a more holistic definition which could be applied to all rural areas in all countries. Researchers in tourism (refer to [4–8]) have suggested some key elements that can be used in characterising rural tourism:

- 1. Located in rural areas and functionally rural built upon the rural world's special features of smallscale enterprise, open space, contact with nature and the natural world, heritage, 'traditional' societies and 'traditional' practices.
- 2. Rural in scale both in terms of buildings and settlements and, therefore, usually small-scale.
- 3. Traditional in character growing slowly and organically, and connected with local families. It will often be very largely locally controlled and developed to benefit the immediate area in the long run.
- 4. The complex and varied patterns of rural environment, economy, history and location result in differing kinds of rural tourism.
- 5. A high percentage of tourism revenue benefits the rural community.
- 6. Permits participation in the activities, traditions and lifestyles of the local people.
- 7. Provides personalized contact with the rural community.

On the other hands, community based rural tourism (CBRT) is an extension of the sustainable rural tourism paradigm which emphasised on the management and ownership of business by the community with funding and assistance from government agencies or NGOs, for the community, with the purpose of enabling visitors to increase their awareness and learn about the community and local way of life [9]. Based on a study by Kamarudin [3] on the sustainability of CBRT in the East Coast of Malaysia, he suggested the following criteria to be used in guiding the development of a CBRT:

1. Based on activities and services are developed through partnerships with all relevant parties, and enhanced by engaging a broad range of local stakeholders.

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- 2. Managed and owned by a formal community group (termed the CBRT committee) rather than by individuals or specific interest groups within a community.
- 3. Empowered local people to define and represent their own communities based on local or traditional knowledge and skills.
- 4. Involve an equitable distribution of benefits and costs among all participants in the activity.
- 5. Promote sustainable community development and establish a balance between economic, environmental, social and cultural sustainability goals.
- 6. Offer high level of tourist satisfaction through activities which utilise the local or surrounding attractions (natural, cultural and human).
- 7. Enhance local development capacity (local leadership and the local CBRT committee or organisation).
- 8. Involve constant monitoring of impacts to ensure a continuous and long-term sustainability of CBRT programmes.

2.2 Dynamics of rural tourism and natural hazards

According to UNEP, there are more than 200 million people affected at a global level every year by disasters associated with natural hazards including droughts, floods, cyclones, tsunamis, earthquakes and wildfires/bushfires [10]. The impacts of disasters on the livelihoods of the affected are greater with the issues of growing populations, environmental degradation and global warming. Such phenomenon posed a clear indication that the global community is now highly vulnerable to these types of disasters and therefore, finding and implementing better mitigation procedures to protect the victims and the environment is becoming more urgent. The sustainability of tourism destinations in rural areas are very much dependent on the ability of tourism players, host communities and other stakeholders to gain more knowledge on how to effectively manage natural disasters and adapt their planning and management practices accordingly while taking into account the impacts of climate change.

Since rural tourism has always been regarded as the impetus that brings in new business opportunities and economic development for various parts of the world, there are several key factors that have impacted the sustainability of tourism businesses, both positively and negatively. One of these factors is the emerging concern on natural disasters and climate changes that occur in tourism destinations unexpectedly. Minimizing losses of life, livelihoods, tourism infrastructure and property during a natural disaster is generally an indicator of the destination's capacity to adequately prepare for and effectively manage disaster events. For many communities, the huge challenge is to make the tourism businesses more resilient to disasters through community-based initiatives.

3. Lifeline Model - Linking between Resilience Rural Community, CBRT and SDGs

The authors using the lifeline model to explain the concept of rural community resilience towards disaster (Figure 1). To guide the discussion, the authors created two assumptions, firstly, by formulated three different scenarios using different colour strings (and by assuming under all three scenarios, the community possess similar capital and functions) namely; Line "1" (green string) represents the community progress towards Sustainable Development Goals (SDGs) without disturbances (disasters) i.e. without taking the element of disasters into equations. Line "2" (blue string) showing the community's progress towards SDGs with element of disasters and by taking into account the resilience concept which was instilled in the community. Line "3" (red string) on the other hands, represents the progress towards SDGs with inclusion of elements of disturbances (disasters) but by excluding the concept of community resilience.

Second assumption was that for each coloured string (green, blue and red) has the same length. These green, blue and red strings will be placed accordingly in horizontal axis to represent the SDGs 2030 target achievement i.e. improving the community livelihoods while tackling climate change and conservation of natural resources. The blue and red strings then were pulled down in vertical axis to represent distortion i.e. the disasters which impacted the community functions and productivity. Using simple comparative on the length of each string, it becomes obvious that the green string (Line 1) will

stretch all the way to year 2030 (i.e. achievement of SDGs) in normal progress without taking into account any disaster elements. On the other hands, for the red string which experienced severe systemic impacts and distortion by disaster (the string was pulled down dramatically) and the community will fall behind for a few years as compared to Line 1 (indicating a slower recovery process of capital and functions), thus will require longer time to improve their functionality and productivity to achieve SDGs target.



Figure 1. Resilience concept as in lifeline model (using different colour strings) (Source: authors, 2019)

As for the community that incorporated the resilience concept and DRR, they will experience minor systemic impacts, however shall maintain most of the vital functions and productivity for recovery. By developing capacity in dealing with distortion, local stakeholders should be able to mitigate all possible damages and speed up the recovery process and will less depending on the constant assistance and recovery towards SDGs 2030 (as compared to community represented by Line 3). In conclusion, the green string represents an ideal situation however it is almost impossible to be translated into a complex real world as we observed today (considering climate change etc.). On the other hands, the red string represents undesirable living condition and threat to livelihoods, and the blue string is the intended scenario which need to be nurtured so that the community could react accordingly in improving livelihoods (and their CBRT businesses in this case) with the occurrence of disasters.

4. Research Methodology

A total of 20 respondents participated in the survey conducted on 10th October 2018 consists of local stakeholders, particularly homestay operators, business people, and residents from within the communities who work in tourism-related sectors, i.e. both in farming and non-farming activities. The respondents were interviewed to represent their opinions and perceptions of the tourism business performance in Mesilou Village, and in relation to the concept of disaster risk reduction and community resilience in disaster-prone areas. As shown in Figure 2, the development of homestays project in Mesilou village can be explained based on spatial distribution. The lower section of the village (marked with red circle) is the cluster of early homestay projects which owned and operated by local people. Meanwhile, the upper section of the village (marked with yellow circle) is cluster of newer chalet and resorts developed and operated by investors both the local and nearby businesspersons. The newer tourism projects are more scattered as compared to the early homestay projects that is more concentred and closed to one another. The survey of local stakeholders was conducted using questionnaire-guided interviews (to obtain quantitative data) and it is supported by qualitative information derived from a series of interviews and informal discussions with local informants, the youth group Mesilou Volunteer Club (MEVOC) and the head of the community. Personal observation of local tourism activities during the fieldwork has also been included.

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Figure 2. Location of Mesilou village, Kundasang, Sabah & distribution of homestays (and other tourism enterprises) in Mesilou as observed and recorded during research fieldwork in October 2018 (Source: as stated on each image)

5. Results and Discussions

The popular tourism and major vegetable production areas of Ranau-Kundasang in Sabah in general, and Mesilou village in particular have come into the limelight after the 6.0-magnitude earthquake shook Sabah in June 2015. Many experts considered the earthquake as the strongest to affect Malaysia since the 1976 Sabah earthquake. Based on local news report, eighteen fatalities were recorded and all occurring on Mount Kinabalu. Many of the local tourism attractions and highland farming areas have been closed temporarily for repair works, however many are yet to recover due to severe and/or permanent damages particularly on the basic infrastructure (collapse bridges, water supply disruption and damaged main roads and farm roads) (Research Fieldwork [11]).

5.1 Profile of respondents and CBRT business in Mesilou village

Survey of local stakeholders as presented in Table 1indicated the majority of respondents i.e. business persons are homestay operators (45%), followed by owners and/or workers in non-farming projects but to some extent, also support the local rural tourism development (40%). The remaining respondents are involved in tourism services as a tour guide/porter, farmer and an owner of a food-based small and medium enterprise (SME) respectively.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Homestay operators	9	45.0	45.0	45.0
	Tourism-related (porter/tour guide)	1	5.0	5.0	50.0
	Agriculture-related (farmers, machine operators)	1	5.0	5.0	55.0
	Food-based SMEs	1	5.0	5.0	60.0
	Non-farming (transportation, catering, coffee shop, mini market, <i>pasar tamu</i> , etc.)	8	40.0	40.0	100.0
	Total	20	100.0	100.0	

Table 1	l. Type	of local	businesses /	['] services	(n=20)
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Source: research fieldwork [11]

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Based on the survey findings in Table 2, more than 55% of the respondents have established their businesses before the 2015 Kundasang earthquake. It is also interesting to learn from Table 2 that local tourism businesses continue to grow even after the disaster. In 2016, two new CBRT businesses were established, followed by another seven new businesses established in 2017. This finding can be interpreted as a positive sign of the resilience of local tourism businesses after a major disaster. It also proved that a place with high tourism potential such as Mesilou is not defined by the earthquake. In this instance, a major disaster event did not deter local and nearby investors to continue developing tourism and other economic projects in the study area.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Early 2000 to 2010	4	20.0	20.0	20.0
	2011 to 2015 (before earthquake)	7	35.0	35.0	55.0
	2016 (post-earthquake)	2	10.0	10.0	65.0
	2017	7	35.0	35.0	100.0
	Total	20	100.0	100.0	

Table 2. Year of establishment of business (n=20)

Source: research fieldwork [11]

In terms of starting up their tourism business, the majority of the respondents specifically mentioned they were using their own money or money from their own savings (55%). On the other hand, about 20% of the respondents were reluctant to share any information related to business capital and their financial source for starting up their business. Another 15% of the respondents obtained funding via a bank loan, whereas "shared capital with partners" and "loan / financial assistance from government" comprises of 5% of the respondents each when asked about the source of their business capital (Table 3). A few respondents stated that they have started their business in an organic manner where they started small before growing into a bigger entity and along the way, they learned the ups and downs in business, accumulating valuable experience and skills to rejuvenate their business. It is the norm to expand homestay units only when they have sufficient cash or capital and most of the construction works have been carried out in-house (by the owners with the help of their relatives and/or children). By doing so, they are able to reduce cost and avoid unnecessary loans, thus ensuring the business can survive in the long run so that it can be passed on to their children in the future.

Table 3. Business capital (to initiate the business) (n=20)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Using own money / own savings	11	55.0	55.0	55.0
	Shared capital with partners	1	5.0	5.0	60.0
	Loan from bank / financial institutions	3	15.0	15.0	75.0
	Loan / financial assistance from government	1	5.0	5.0	80.0
	Others (not specify)	4	20.0	20.0	100.0
	Total	20	100.0	100.0	

Source: research fieldwork [11]

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5.2 Challenges for CBRT business continuity and resilience in Disaster-Prone Areas

As presented in Table 4, the majority of the respondents stated their businesses were directly and/or indirectly affected by the disasters, and mainly experienced once or two times of disruptions (80%). From this percentage, 15% of the respondents agreed that their business were disrupted many times by the disasters and the remaining 5% stated his business was spared from the disasters. Among the reasons given by the respondents for the low level of business disruptions is many of the homestays are located at the centre of the village which is located quite far from the Mesilou River, a high risk area due to the debris flow and mud flooding (refer to Figure 2). The earthquake, followed by debris flow wiped out the main bridges but most of the major infrastructures in the village remain intact and were spared from any serious damages.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, disrupted many times	3	15.0	15.0	15.0
	Yes, only once or twice	16	80.0	80.0	95.0
	No disruption	1	5.0	5.0	100.0
	Total	20	100.0	100.0	
		C		1_ [11]	

Table 4. Business disruption prior to disasters (n=20)

Source: research fieldwork [11]

In relation to business recovery challenges, the majority of the respondents (70%) mentioned that their business activities have fully recovered within a month after the disaster (refer Table 5). 30% of the respondents were able to resume their business operations just within 24 hours prior to disasters, followed by 20% needing less than a week and another 20% needing less than a month.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Within 24 hours	6	30.0	<u>30.0</u>	30.0
	Few days but less than a week	4	20.0	20.0	50.0
	Few weeks but less than a month	4	20.0	20.0	<u>*70.0</u>
	Few months, but less than 6 months	4	20.0	20.0	90.0
	> 6 months	2	10.0	10.0	100.0
	Total	20	100.0	100.0	

Table 5. Length of business recovery prior to disasters (n=20)

Source: research fieldwork [11]

Findings from the survey indicated that past and current disasters posed various challenges to the local tourism businesses. Based on the multiple choice answers given, many respondents mentioned their answers as in combination of few challenges. The highest percentage is the combination of three factors namely: (1) the closure of the main road to the village and main tourism attractions; (2) declining numbers of tourists visiting and; (3) higher booking cancellations (40%) (refer Table 6). Second most popular answer given is a combination of "closure of the main road to the village and tourism attractions, decline in numbers of tourists, temporary closure of local transportation and infrastructure damage" (35%).

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		Percen			Cumulative		
		Frequency	t	Valid Percent	Percent		
Valid	Closure of main road & tourism attractions & <u>decline in number of</u> <u>tourists</u> & higher booking cancellations	8	40.	0 40.0	40.0		
	Closure of main road & tourism attractions, <u>decline in number of</u> <u>tourists</u> , disruption of local transportation & damage in infrastructure	7	35.	0 35.0	75.0		
	Closure of main road, high booking cancellations, damage in infrastructure & bring negative image and reputation	3	15.	0 15.0	90.0		
	Decline in number of tourists, high booking cancellations, disruption of local transportation & damage in infrastructure	1	5.0	0 5.0	95.0		
	Not related	1	5.	0 5.0	100.0		
	Total	20	100.	0 100.0			

Table 6. Effects of disaster to local businesses and community (n=20)

Source: research fieldwork [11]

The most pertinent challenge mentioned by respondents is "decline in tourist arrivals" particularly for a few months after earthquake hit their village. Fear about their future safety, many tourists have cancelled their early booking and spreading of negative news (if not false news) in social media about the possible future earthquake had deter potential visitors to Mesilou (Research Fieldwork [10]). Figure 3 summarised the list of challenges facing by respondents in sustaining CBRT in Mesilou village, particularly after the 2015 earthquake. Despite challenges and disturbances caused by disaster to their business performance i.e. combination of various internal and external factors (Table 6 and Figure 4), many of local CBRT operators were able to persist and continue to accommodate new visitors within the first 30 days or less than three months.

The result also can be linked to Figure 1 of this paper i.e. lifeline model (blue string: Line 2), whereby the CBRT business in Mesilou was affected by disaster, however majority of operators were able to bounce back and become resilient. The findings also in line with information on CBRT establishment in Mesilou (refer to Table 2), which indicated many new businesses were established after 2015-earthquake; sending clear massage there are huge potential and demand for CBRT in highland and disaster-prone area and disaster did not deter both tourists and investors from Mesilou village.

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Figure 3. Effects of disasters to local tourism and community in Mesilou village (Source: research fieldwork [11])

6. Conclusion and The Way Forward

As Mesilou is one of the most popular tourist destinations in Sabah, the occurrence of a major disaster will inevitably impose certain challenges for CBRT businesses and will implicate the image and reputation of the business community in the village. In this light, the research has identified several challenges of a disaster to Mesilou's image and reputation, and the extent to which these factors effected the CBRT performance and its ability to bounce back and becoming more resilient. As discussed in the analysis and findings section, the majority of the respondents stated that disasters imposed short-term negative implications to the tourism business community in Mesilou. However, the situation will improve over a short period of time i.e. visitors return within a month to three months after the earthquake. Furthermore, many of the respondents agreed that safety concerns about the village and surrounding attractions have always been a priority among visitors, as well as to the locals. Safety assurance is therefore very important to regain tourists' confidence.

The advancement of CBRT business and increase interest from investors to develop new homestays and chalets in Mesilou is indeed a good news to local community as the projects will create more local jobs and encourage local people to remain in the village (i.e. curbing out-migration or working outside Kundasang area). Other than that, the popularity of Kundasang in general as gateway to Kinabalu Park, and Mesilou village in particular had drawn steady number of tourists arrivals hence allowed new form of farming-related projects including the aquaponic farms (semi-organic farming integrated with fish pond) to be promoted into local tourism ecosystem (Research fieldwork in 2018). Based on the field observation, many new areas (hilly and near to Mesilou river) have been cleared for future development. Although the land belongs to private owner, they have to bear in mind about the previous history of disaster that strike Mesilou and it would be wise to take precaution and apply certain degree of development control for high risk and environmental sensitive areas. As for the way forward, CBRT operators and local business entity in Mesilou village need to instil awareness to all local stakeholders about the importance of having a balanced development i.e. maintaining long-term economic gains from tourism, while continuously exercising disaster risk management measures and strategies with vision to reduce future risks.

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The Assessment of Social Housing through The Availability of Social Facilities

by Ragil Haryanto

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The Assessment of Social Housing through The Availability of Social Facilities

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Abstract. Social facilities are one aspect that must be fulfilled in a residential environment. The orientation of the provision of facilities as a component of the housing environment and easy-to-reach use should be a consideration of housing development and management. Social housing built by the government through *Perumnas* was built with a large number of units. Over time and the age factor, Perumnas experienced developments and problems so that the quality of the environment in Perumnas decreased. This paper aims to assess social facilities services, using distance and travel time factors based on the concept of neighborhood units. The research uses a quantitative approach as a basis for finding the concept of neighborhood units in mass housing. The results in this study are the level of accessibility to reach social facilities in the Perumnas Banyumanik based on distance and travel time to access social facilities included in the medium accessibility. Besides that, the study found that social facilities as supporting life in mass housing Perumnas can be a strong bond in the neighborhood unit concept. Sustainable housing development requires the management and provision of social facilities through easy access in the concept of neighboring units.

Keywords: social housing, perumnas, the concept of neighborhood units, social facilities

1. Introduction

Service needs in housing for its occupants must be fulfilled by being equipped with infrastructure, utilities, social facilities, and public facilities that are adequate by the population accommodated [1]. Housing units or better-known neighborhood units are interpreted as physical environments that have clear boundaries, and social service services are available for low levels in serving several residents [2]. The orientation of the provision of facilities as a component of the housing environment and easyto-reach use should be considered as a housing development. Accessibility to environmental facilities is based on explaining the use that is easily passed by using the concept of neighborhood units by Clarence Perry's or better known as the concept of environmental units [3]. Monitoring this concept is an evolution of the theoretical concept of Ebenezer Howard Park City and social reform aimed at urban population growth [4].

The concept of the neighborhood unit explains the limitation of a bright environmental unit to the center of housing and consideration of the ability of humans to reach housing facilities. The concept of neighborhood units is based on settlements and family units within a community with a particular physical unit [5]. The primary key in this concept is housing that should provide a sense of security and comfort for the community to fulfill or carry out their activities. Neighborhood unit planning that

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emphasizes physical aspects, in essence, is an effort to realize the balance of the social life of its inhabitants [6]. This means that environmental units are primarily physical models that provide opportunities for social interaction between residents [7].

The housing planning is closely related to access to environmental facilities, housing facilities as housing facilities and infrastructure [8], [9]. The planning of providing housing social facilities usually begins by considering the closeness to the center of the house group so that it can meet the ideal conditions of housing. The existence of a housing social facility is essential to support the quality of life and mobility of residents in the ideal housing, such as the availability of social facilities. The link between housing that considers the healthy distance of residents and facilities can recognize the level of accessibility as well [8]. So, implies that essential factors influence the welfare and quality of the housing environment in the access dimension [10].

Housing for low-income communities (social housing) that was built by *Perum Perumnas* (National Housing Author 4) V Regional of Semarang City is complemented by service needs to support the 4 ctivities of its residents. The existence of social facilities informal housing has a function to provide services and support community needs in social, economic, and cultural aspects [11]. Over time, the physical condition of several social facilities that have been built has decreased in quality. This condition is like what happened in *Perumnas* Banyumanik that it is not necessarily complete the provision of the types of social facilities that exist considering the quantity and convenience of residents accessing. This decrease in quality also affects the interest of residents to access environmental facilities around the location. For example, to go to open space facilities or playing fields for homes that are far from the location of the facility, surely they cannot use the facilities provided or will only use the streets in front of the house as a field. The development of *Perumnas*' age also influences possible access due to some physical changes in it. This paper aims to assess social facilities services, using distance and travel time factors based on the concept of neighborhood units in the *Perumnas* Banyumanik in Semarang City.

2. Methods

The analytical nethod used in this research is descriptive quantitative using the Likert scale assessment method. Likert scale is a scale used to measure attitudes, opinions, and perceptions of a person or group of people about social phenomena [12]. The quantitative approach has one goal to test the theory [13]. This approach uses theory, and the existing literature is chosen as the research variable. One of them is the concept of environmental units, environmental facilities for social housing, provision, and accessibility. The research location is in *Perumnas* Banyumanik located in Srondol Wetan Village, Pedalangan Village and Padangsari Village, Banyumanik District, Semarang City. In the *Perumnas* Banyumani^[2] there are three types of houses, namely type D21, D33, and D36.

This quantitative approach is based on the philosophy of positivism, meaning that it is used to examine specific populations or samples, data collection using research instruments, and quantitative or statistical data analysis. This study uses a specific sample for accessibility representatives of residential neighborhood facilities in *Perumnas*. Besides, this research is deductive to answer the problem statement using the concept of housing environment units [13], and then analyzed to get measurable results regarding the level of access using descriptive statistics.

The analysis carried out to obtain the accessibility level index was carried out by the scoring method. Scoring analysis was carried out by giving score scores on each indicator determined by each of the criteria (Table 1). This assessment uses three levels of scores: 1, 2, and 3. The score is obtained from the questionnaire data, which is converted into numerical form, that is, by giving 1-3 values in each of the answers to the specified questionnaire.

Travel time to

access facilities f

3

f x b

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Indicator	Score					
indicator	3	2	1			
Distance to access facilities	Characteristics of houses with a distance of ≤ 400 m can access facilities (in <i>Perumnas</i>)	Characteristics of a house with a distance of> 400 m can only access facilities (in <i>Perumnas</i>)	Characteristics of houses that have to access facilities from outside the housing sector			
Travel time to access facilities	Facilities can be accessed from 5-15 minutes	Facilities can be accessed 16-20 minutes	Facilities can be accessed in> 20 minutes			

Table 1. Assessment criteria (scores) on accessibility indicators

The assessment of each indicator is then calculated to obtain an index value of the leve of accessibility of each type of house and social facilities by using the Likert scale. For more details can be seen in the calculation of Table 2.

					,		5		
	Low Access			Medium Access			High Access		
Indicator	Frequency	Weight	f x b	Frequency	Weight	f x b	Frequency	Weight	f x b
Distance to access facilities	f	3	f x b	f	2	f x b	f	1	f x b

f

Table 2. The analysis of social facility accessibility index

The level of accessibility index for social facilities, there are three classes which can be translated into grades 1-3 for each specified criteria. Calculating the index value on the valuation, the Likert scale calculation is used so that the results of the category of accessibility index for social facilities are obtained (Table 3).

2

f x b

 \mathbf{f}

1

 $f \mathrel{x} b$

Index Panae -	Highest Index – Lowest Index
index Kunge –	Number of levels of score
	$=\frac{3-1}{3}$
	= 0,67
Table 3. Social fa	cility accessibility index category
Index Value I	ndex Category at Accessibility Level
1.00 - 1.66	Low accessibility
1.66 - 2.33	Medium accessibility
2.34 - 3.00	High accessibility

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3. Result and discussion

3.1. Identification of Availability of Social Facilities at Perumnas Banyumanik

The condition of the Perumnas Banyumanik since the beginning was built has been equipped with several facilities to support community activities in it. The five types of facilities are identified as being available in *Perumnas* anyumanik. of the five social facilities, their needs were identified in the Housing Office based on SNI 03 1733-2004 concerning Procedures for Housing Planning in Urban Areas and SNI 03-6981-2004 concerning Procedures for Planning a Simple Non-Composite Housing Environment in Urban Areas. The following are the results of identification of availability and needs of social facilities based on existing standards in Perumnas Banyumanik with a population of 22,057 people in Perumnas Banyumanik.

Table 4. Amount of availability and need for social facilities at Perumnas Banyumanik

Facility Type	Availability of Eacilities (Existing)	Facility Requirements
Educational facilities	Tacinics (Existing)	(Analysis Results)
PAUD	4	22
Kindergarten	15	22
Elementary school	6	14
Junior high school	1	5
Senior High school	2	5
Health facilities		
Posyandu	15	18
Citizens' Medical Center	3	9
Puskesmas	1	1
Doctor's Practice Site	10	4
Pharmacy	7	1
Trading facilities		
Stall	63	88
Shop	11	4
Market	2	1
Worship facilities		
Islamic Prayer Room (Musholla)	4	88
Citizen Mosque / RW	14	9
Village Mosque	1	1
Church	2	1
Sports and Open Space facilities		
Park Environment / Playground	11	88
Field	17	9
		5

Several types of educational facilities are available in the Perumnas Banyumanik Area to meet the needs of the *Perumnas* community. Educational facilities that are located in the middle of a residential environment and the center of a residential environment. When referring to the results of the needs, the number of educational facilities is inferior to fulfill. However, the community can still reach educational facilities that are outside the housing complex, which are located not far from the Perumnas area.

The existing health facilities at the Perumnas Banyumanik show that they have been completed starting from the *posyandu* (health facilities), community medical centers, health centers, doctors' offices, and pharmacies. The placement of the health facility is located on the main road of the housing environment and is close to the center of the residential environment. Based on the results of

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the analysis, several health facilities are still less than needed. However, the number of existing health centers, doctors' offices, and pharmacies are adequate.

Trade facilities at the *Perumnas* Banyumanik consist of stalls, shops, and markets. Markets in residential areas are Rasamala Market and Damar Market. These two markets are located on the main residential road. The placement of shops and minimarkets in *Perumnas* Banyumanik if it is associated with the principle of neighborhood units has explained the appropriate conditions because it is placed around a traffic lane (main road) that binds several environments. If referring to the calculation of needs, the number of stalls that exist is still less than the requirement based on the standard. However, for the availability of minimarkets and markets, the amount has exceeded the calculation of needs and has the same trade function so that it can cover the lack of stalls.

The worship facilities located at the *Perumnas* Banyumanik consist of prayer rooms, mosques, and churches. These facilities are located on the main residential road and in the center of the residential area. For two churches in a residential area not only serve residents in the housing but also serve the community to all Banyumanik Districts. Based on the number of mosque needs, the number will be very less compared to the number of currently available. However, if look at the number of existing mosques already exceeding the number of needs, so the shortcomings of the mosque can be complemented by the existence of a mosque that can serve a larger population.

Sports and open space facilities found at the *Perumnas* Banyumanik consist of a field, an environmental park, and a playground. Some existing fields are still utilized according to their functions optimally and are also often used to support several activities to increase social interaction between residents of housing. However, several fields are not used optimally as they function, although the Bacation of sports facilities and open space has been in the middle of a residential environment. Based on the results of the analysis of the needs of environmental parks, the number is very less than the number of existing ones. However, the number of available fields, the conditions are appropriate because they exceed the calculation and can replace the same function of the environment playground, which is less than it should be.

3.2. Distance Accessing Social Facilities

The concept of environmental units refers to Perry as the initiator of the neighborhood unit concept explaining that physical closeness is one of the requirements to meet the neighborhood unit so that it can be implemented in planning. Previously to obtain some data on the physical proximity of the house by referring to Perry's sketch of the population in consuming local facilities, the maximum radius that can be reached is ¼ miles or 400 meters on foot. The ease in a distance of accessing social facilities can be seen from Perry's ideal distance, and placement location is still inside or outside the housing [3]. Distance and location of residents in accessing facilities are divided into five social facilities, including educational facilities, health facilities, trade facilities, worship facilities, and sports and open space facilities.

After knowing the selection of distance and location of social facilities that are easily reached by residents of the housing complex, the next step is to conduct the assessment method, that intended to obtain an index value related to the distance that is easily reached by residents.

Facility type	The index v	Perumnas		
r denity type	D21	D33	D36	1 crannus
Educational facilities	1.53	1.71	1.75	1.62
Health facilities	2.08	2.13	1.75	2.09
Trading facilities	2.12	1.96	2.00	2.04

	Fabl	le 5.	. The	index	accessibility	to social	facilities
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Average Index	1.93	2.11	2.10	2.06	
Sports and Open Space facilities	1.59	2.13	2.00	1.86	
Worship facilities	2.69	2.60	3.00	2.66	
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Medium

Medium

Medium

Medium

Table 5 seen the distance of accessing the five social facilities at the *Perumnas* Banyumanik are in the medium category (index value 2.06). Means that the level of ease in achieving social facilities at the *Perumnas* Banyumanik is still included in the medium category. The residents of the housing sector who access facilities with long distances (> 400 m in housing) are quite high in percentage. Besides, the percentage of residents who access facilities outside the housing sector is also high. Although in general, the residents of the housing complex easily reach the social facilities that are in the housing sector. Based on the type of house category, both houses with the characteristics of types D21, D33, and D36 indicate similarities with the index results in the housing sector, namely medium.

3.3. Travel Time Accessing Social Facilities

Travel time is one indicator to assess the level of accessibility. If the travel time is short, then the performance of accessibility is high, and vice versa. To measure travel time, it also needs to be related to the distance to access and the choice of how to access or the mode of transportation used. By the ideal distance that Perry has sketched 400 meters on foot, it can be reached in 5 minutes and a maximum of 15-20 minutes. The following is a description of the travel time to access each type of social facility and typology of houses in *Perumnas* Banyumanik.

After knowing the travel time that is easily achieved in accessing social facilities by residents of the housing complex, the next step is to conduct the assessment method to obtain an index value related to travel time that is easily reached by residents.

Facility type	The index value for each type of house			Perumnas
	D21	D33	D36	1 01 01 01 01 00
Educational facilities	1.47	1.82	2.25	1.66
Health facilities	2.41	2.42	2.00	2.40
Trading facilities	2.39	2.33	2.00	2.35
Worship facilities	2.78	2.84	3.00	2.82
Sports and Open Space facilities	1.78	2.36	1.50	2.03
Average Index	2.16 Medium	2.46 High	2.15 Medium	2.25 Medium

Table 6. Index level accessibility travel time indicators to social facilities

Based on Table 6, the five social facilities in the *Perumnas* Banyumanik has an average accessibility index value (2.25) in travel time. The ease of travel time in achieving social facilities is included in the medium category, because some of the facilities are unable to respond to occupants' preferences so that some residents access facilities outside the housing complex and do not get shorter travel times. Although in general, the housing residents easily reach the social facilities that are in the housing sector and still consider the proximity to existing facilities in the housing sector as a priority. If based on the type of house, occupants in types D21 and D36 have an intermediate level accessibility index level. Whereas the type of house D33 shows the accessibility index in the high category. So, the ease of achieving social facilities in this type of house is shorter than other types of houses.

3.4. Accessibility Level of Social Facilities

The analysis by comparing indicators in accessibility analysis based on both indicators. The two indicators are the distance of residents to reach social facilities and travel time. The following is the result of an assessment of the level of accessibility in *Perumnas* Banyumanik (Table 7).

Indicator	Educational facilities	Health facilities	Trading facilities	Worship facilities	Sports and Open Space facilities	Social Facilities
Distance to access	Low 1,62	Medium 2,09	Medium 2,04	High 2,66	Medium 1,86	Medium 2,05
Travel time to access	Low 1,66	High 2,40	High 2,35	High 2,82	Medium 2,03	Medium 2,25
Accessibility Level	Low 1,64	Medium 2,25	Medium 2,20	High 2,74	Medium 1,95	Medium
Rank	5	2	3	1	4	2,15

Tabel 7. The accessibility level of social facilities

The level accessibility of social facilities in *Perumnas* Banyumanik is included in the medium category, namely 2.15. The index is obtained after considering and calculating the value of each facility on each indicator. For distance indicators, residents reach social facilities with intermediate results (2.05) as well as social facility index values for travel time indicators (2.25). Whereas the lowest level of accessibility is educational facilities (1.64) and the highest level of accessibility is worship facilities (2.74).

The distance indicator of residents reaching social facilities gets intermediate results because the dominance of each value among the five facilities is medium, while high scores are only found in one worship facility and even low scores are found in educational facilities. The low value is because it was found from several residents, many of whom used facilities that were outside the housing sector. The condition is because residents who choose educational facilities outside the housing complex are quite high (reaching 37.76%), so the travel time needed to reach this educational facility is also quite long. So, from the accessibility index of travel time in educational facilities in the low category (1.66). The occupants reach social facilities with the highest index value found in worship facilities, because the majority of residents choose facilities that are close as a priority, so the travel time needed also tends to be short. So, that the level of accessibility in worship facilities is the highest index value among other social facilities.

In general, such conditions which explain the level of accessibility of social facilities in *Perumnas* Banyumanik based on the distance of location and travel time show a final medium value. The medium category indicates a decline in the quality of the housing environment, but residents of the *Perumnas* Banyumanik still use social facilities.

4. Conclusion

The level of accessibility to reach social facilities in *Perumnas* Banyumanik is based on distance and travel time to access social facilities included in the medium category. The intermediate category is caused by several things seen from the distance of the occupants reaching social facilities and travel time to access social facilities that are both in the medium category, because there are still some people who access social facilities within a distance of> 400 m in public housing, and social facilities that are outside the housing sector. The travel time needed to reach educational facilities is also quite long. So that the level of accessibility of social facilities in *Perumnas* Banyumanik based on the

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distance of location and travel time shows a final average value. The medium category indicates that there is a decline in the quality of the housing environment, but residents of the *Perumnas* Banyumanik still use social facilities. It is still by the concept of neighborhood unit Clarence Perry, who stated that in a residential neighborhood where factors of social facilities and distances significant achievement. From the results of this research, further research can be conducted to assess the sustainability of *Perumnas* Banyumanik.

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