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Research paper



Determination of Sustainable Heritage Preservation Zone using Multi-Criteria Analysis in Taiping City

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Abstract

Urban sustainable heritage preservation is not just seen as a heritage building only, but also the factors that influence the building that should also be considered so that any changes in any part of the urban will not change the urban fabrics. Therefore, the relationship between heritage buildings with other planning information can be seen in creating integrated area sustainable preservation plan. The aim of this research is to analyze the Geography Information System application in upgrading the existing information together with the urban sustainable heritage preservation information in developing an integrated area sustainable preservation plan. Geography Information System was chosen as tools because of its significant data manipulation, higher efficiency in generate many alternative scenario and accessible to the data. The question is what are the sustainable criteria to selecting of areas heritage preservation? The objective for this study is to produce sustainable criteria in determining the selection of area for action based on the difference information land use and visual quality heritage preservation. The second question in this study which is how to determine the heritage preservation action based on sustainable criteria? The second objective in this study is to design and developing a Geographical Information System database than can be used in the determination analysis heritage preservation area. The third question in this study where are the sustainable area for heritage preservation in Taiping City? the third objective in this study to produce the result analysis of the analyzing pattern and the thematic maps to identify area of action for preservation zone in Taiping City. This study employed the qualitative approach with the application of document analysis as the research design. Data collection was divided into two groups that is primary data and secondary data. Primary data were obtained through interview with several respondents and secondary data were obtained through documents, books, articles, journals and other sources of reading material. The data of heritage building and planning information the basic in the stage of designing the heritage databases for Taiping. The design of the databases considers all needs in area sustainable preservation. There are two type of analysis model designed based on the integrated conservation actions. The first model is about to determination the threat area and need for conservation. The factors that be considered for this analysis consist land use, visual and location factors. While the second model analysis is about the action control for building sustainable preservation that consists of the history, architectural style and building condition to ensure the appropriate history action through the preservation heritage building. The final output for this research is the area sustainable heritage preservation management plan with the proposal of preservation guidelines for the specific area sustainable preservation in Taiping City. This output where is area and building sustainable heritage preservation plan could help the local authority to determine the suitable preservation for their administrative area.

Keywords: *Sustainable; Heritage Building; Preservation; Geographical Information System*

1. Introduction

The concept of sustainable development has been around officially around 1980s. Sustainable development is defined as activities that generate economic growth and guarantee for building a collection of wealth for the development of social infrastructure [3]. Social facilities and human capital is used to improve the quality of life of the community. Natural environment in turn remained strong and nourished skin to ensure the well-being of the people in a particular place; natural resources are structured and prudent to ensure the survival of the future not only for our self, but for the future of children who will be occupying the same area someday. Association between the three dimensions of the concept of sustainable development can be assessed through the development of policies determined by the ruler. According to [6] "cities with its residents enjoy a high quality of life so that the socio-economic problems, the environment and health are not transferred to another place or to future generations". Rapid development undergone by urban residents has been pressured in terms of socially and economically. Hence, it has added difficulties in the planning and management of a town. It is a very common thing where development takes place first before managing a town. Implicitly, development pressure will bring threats to the places which are rich with heritage and culture. In order to conserve the heritage buildings strictly stated that any efforts in conserving of heritage buildings need to be done by taking up few factors such as historical values, heritage, architecture, age, functions, building materials, maintenance, and the supports from all ranges of related parties [2]. This rapid urban growth led to the construction of buildings that feature the latest modern design and appearance affect the town where the old buildings that have its own architecture will be replaced with new buildings. This can cause the extinction of the elements of history and architecture if there is the absence of conservation efforts done [5]. Destruction of old buildings can be seen more pronounced in old store buildings, the majority located in the town center. Its strategic location at the economic impact has increases the value of property in urban areas, thus, causing certain

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parties and also the owners of the buildings rather to replace the old store buildings with modern buildings. However, most of this heritage building according to [5] is not restored properly and most of them are bad which pushed up due to building damage factor. More unfortunate again some of this heritage building is being threatened because of destruction ignored beginners and demolished development pressure and lack of public attention in efforts to conserve heritage buildings [1]. The demolition of the old store buildings is on the ground for commercial purposes. In order to preserve the heritage buildings, the role of the Local Authority (LA) is important in realizing the concept of monitoring and care in the administration. Conservation is a field that involves the maintenance and upkeep of heritage buildings from being destroyed by taking into account its importance to the nation and society as historical and aesthetic factors are there in a heritage building [1].The need for the information of heritage buildings is very important in determining actions to be taken by local authorities for the maintenance work. Data storage is also important to facilitate local authorities to achieve the data to design guidelines and programs relevant to the conservation of heritage buildings. Local authorities should also know that heritage preservation planning is more efficient and practical, and can only be achieved through better information. The information should come from information retrieval systems more robust. Local authorities need to actually change the system in the form of information storage to file storage system for better information. The development of information technology has created a better and wide variety of information storage systems, sophisticated and efficient [7]. Among them is Geographic Information System (GIS), which has the capability and the ability to store, manipulate, analyze stored data and able to answer many questions of planning. To facilitate and optimize the planning and management of heritage buildings, the use of GIS can be applied as a tool of analysis in implementing an application inventory of buildings of historical heritage namely to control development and so on. With this ability, the application of GIS is seen as a tool to manage the preservation of the heritage. With the ability of geographic information system in terms of data management and analysis of information, further in the planning, management and monitoring of heritage.

2. Problem statement

In order to ensure the preservation of the heritage in line with sustainable development is the development of the built environment will harmonies with nature in which their relationship was balanced and mutual with conservation includes the replacement of resources, changes in the manner of use and pay attention to the 'intangible' factors such as value convenience and heritage. Planning and management in preserving the historical heritage is a particularly challenging area of planning for local planning authorities as well as the increase of rapid development. Some problems in the preservation of the heritage are major challenges to the efforts of preservation. One of these is the pressure and the threat of development on heritage buildings. Rapid economic development increases the demands of the use of space in urban or rural areas. Most of the heritage buildings located in the downtown area is in a threat of destruction due to the increase in the value of land and market forces to dominate the area. It is to accommodate new development to replace it with multi-storey buildings which is able to provide superior returns [1]. Thus, historical areas will be affected directly or indirectly by new development programs whether residential, commercial and industrial. As the rich heritage of successful tourism resources, development pressure on the area is to be managed in a systematic manner in order to avoid impairment to the quality and value of the historical buildings. According to [2] if a building was last up to 100 years of age, accordingly it should be called a heritage building. In Malaysia, most of the shortlisted buildings as heritage buildings were built between the years 1800 to 1900. In addition, there was no comprehensive planning and management for the purpose of preservation of the heritage [2]. In the preservation of heritage buildings, it requires careful planning and a thorough and requires statutory planning documents such as the Local Plan, Structure Plan and the Special Action Plan for support. Requirements of the development plan is to ensure a sensitive area in terms of historical sources can be categorized as successful conservation zones to protect and preserve this heritage of successful resources development from any threat. The least efficient of manual management in managing maintenance data also provide data availability is a key factor in ensuring the planning and analysis of the resulting planning decisions are justified and accurate, especially in the field of heritage conservation area. Generated inventory data can form a clear understanding of the context of heritage preservation. This requires a lot of data, such as land use information, features of historical buildings, infrastructure, landscaping and so on. Data management requires time and complicated work where it takes a long time mainly manual methods. At this time, the collection and storage of data for heritage buildings are still done manually. Through a study, comparing manual techniques to computerized technique to record the monumental structure data, it shows that the use of computerized techniques provide advantages in terms of accuracy, time and accuracy. Looking at the above statement, most disputes can be resolved with an effective management system to assist decision-making heritage conservation and manage data [4]. One of the most common system used in the application of planning and management is a Geographic Information System (GIS) or more simply. GIS allows data retrieval process done systematically and automatically. Display data can also be done easily with the support of the map can reveal potential areas for development [4]. Applications in GIS are also able to answer complex questions and can be shared by multiple parties.

3. Methodology

The research methodology process includes the research design, research process, and method of data analysis as well as the findings on data analysis. The explanation on methods and techniques used for this research study are briefly described further in this chapter in order to meet the objectives of this study. A strategy chart is created to show a flow in achieving all the objectives of this study. Basically, there are two phases involved in this study as illustrated in Fig 1. The following portray the phases involved and their related activities. The first phase is an early stage that needs to find its issue, problems statement, and research gaps of the study through the instrument of literature review by using articles, journals, books, proceedings, magazines, seminar papers and reports. Then, the aim, research objectives and research questions of the study are created. Objective one which is to produces sustainable criteria in determining the selection of area for action based on the difference information land use and visual quality heritage preservation carried out. An extensive literature review and interview with the heritage specialist held to achieve objective one. Meanwhile, objective two which is design and developing a GIS database that can be used in the determination analysis heritage preservation action based on determination sustainable criteria. In the second phase, the criteria incorporated from the survey earlier analyzed and the best practice produces the result analysis of the analyzing pattern and the thematic maps to identify areas of action for preservation in Taiping City. After that, validation of the developed maintenance best practice done through a simple face-to-face validation interview with the local authority expert in order to verify it. From the data analysis obtained, the objectives of the study can answered. Then conclusions and recommendations for future research made based on the finding from the data analysis.3.1.

4. Result and analysis

Model analysis performed to determine the areas that require action and building maintenance management requires specific maintenance action in retained its heritage elements in Taiping City. This could indirectly serve as a guide in creating maintenance control plan for development in the study area. In its rationale, the determination of the preservation and conservation action undertaken is the building in order to help local authorities can take immediate action on areas with the designation of the planning guidelines for the preservation of the heritage preservation efforts and actions delay will only put these heritage resources in conditions increasingly threatened by development. The development of heritage database which stores all sources of relevant information to improve the efficiency of heritage resources can help local authorities to achieve quality information. This also helps local authorities outlining and preparing policies and guidelines on the preservation of control in administrative areas more efficiently. Formation plan appears to minimize the cost of maintenance and repairs drive towards creating a more integrated care management. Management and integrated care planning are able to repair town image and identity, promoting the influx of tourists and maintain historical architectural heritage.

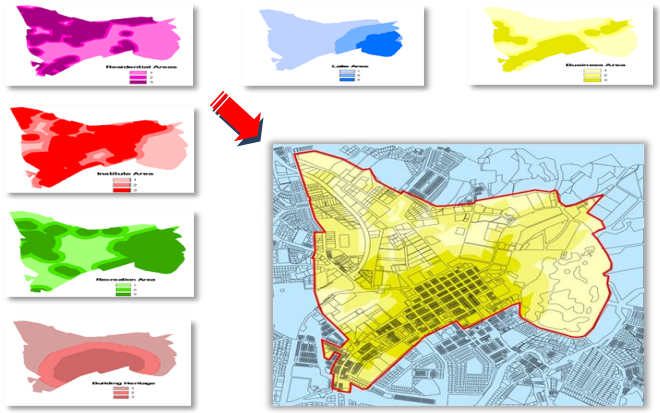


Fig. 1: Analysis model of sustainable preservation zone

The main features of the city's zoning zones are such as containing a row of buildings and heritage monuments, elements that contribute to the formation of urban images and areas that are of great importance to the appearance of the city. Most of the legacy of old buildings are located within this zone. The city's preservation zone is a historical core area that needs to be strengthened in line with its function as a major heritage area. It is recommended that the business activities that become the heart of the city are preserved as a scene of events that have taken place. In addition, the existing architecture and architecture of the building should also be maintained and any activities carried out in this zone should not damage the appearance of the original building. The original design of the building is an important aspect of maintenance and repairs that must be given to this aspect.





Fig. 2: Analytical model implemented by Geographic Information System as a computer based system to assist planning and decision making for the successful development of sustainable heritage preservation.



Fig.3: Analytical model implemented was able to identify areas requiring sustainable preservation and buildings requiring specific maintenance measures.

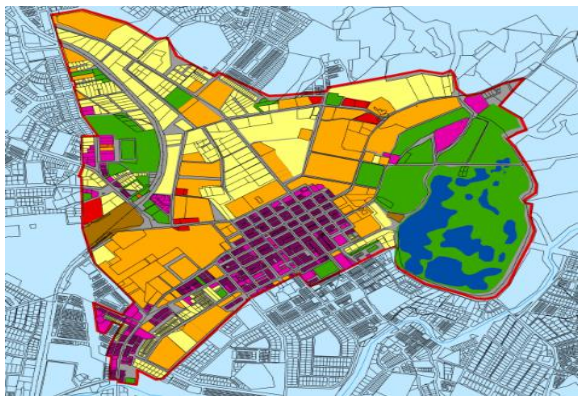


Fig. 4: Analysis model of building use in critical heritage zone

The main features of this zone include a number of historical heritage assets or monuments located outside the current urban conservation zone such as the Taiping Prison building, State Museum, which not only includes historical buildings within the city of Taiping only. This is to ensure that all of the most important assets available in Taiping are protected and obtain special control protection so that they are not neglected. The existence of this zone is a mechanism to control any development that can put pressure on the assets of the heritage. Development in this zoning area must also be controlled so that it can support the image of Taiping Heritage City.

5. Conclusion

GIS application development is not limited to the creation of a database only, but it also involves the display of data and storage information. Its use extends to the stage of the analysis where it can generate models of different development scenarios based on

various criteria. In this case, the determination of the GIS data is an important stage in view of the data will used for the purpose of analysis. If the data stored in the database cannot be used for analysis, this means that the development of the database less meaningful and GIS functionality is limited to the extent of the database development as well as the portrayal of GIS data only. Therefore, database development should lead to the generation of analysis to be produced. Analysis on the other hand is aimed at fulfilling the needs of a particular concept or planning. Effective and systematic analysis will drive the planning and development towards a more sustainable and holistic. In addition, the quality of the planning drafting decisions can be enhanced when the available data can be used in a way that's fast and up-to-date computer-aided. Preservation of the historic area that is part of planning and resource management heritage is important for guarantee areas and buildings that have special value is preserved.

References

[1] Andrés, M., & Pozuelo, F. (2009). Evolution of the architectural and heritage representation. *Landscape and Urban Planning*. Vol. 91, No. 2, pp. 105-112.

[2] Avrami, E., Mason, R., & Torre, M. D. la. (2000). Values and heritage conservation: Research report. The Getty Conservation Institute, Los Angeles.

[3] Gretzel, U., Go, H., Lee, K., & Jamal, T. (2009). Role of community informatics in heritage tourism development.. In: Hopkin W. Gretzel U., Law, R. (eds). Information and Communication Technologies in Tourism. Springer: Vienna.

[4] Parcero-Oubiña, C., & White, P. (2013). GIS-based tools for the management and dissemination of heritage information in historical towns. The case of Santiago de Compostela (Spain*). International Journal of Heritage in the Digital Era*. Vol. 2, No. 4, pp. 655-675.

[5] Pickard, R. (2001). *Policy and law in heritage conservation*. CRC Press: Taylor & Francis Group.

[6] Stanco, F., Battiato, S., & Gallo, G. (2011). *Digital imaging for cultural heritage preservation: Analysis, restoration, and reconstruction of ancient artworks*. CRC Press: Taylor & Francis Group.

[7] Stewart, D. (2001). New tricks with old maps: urban landscape change, GIS, and historic preservation in the less developed world. *The Professional Geographer*. Vol. 53, No. 3, pp. 361-373