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2022

E-PROCEEDING OF

1st INTERNATIONAL
E-CONFERENCE ON
GREEN & SAFE CITIES
2022

“Sustaining the
Resilient, Beautiful and Safe Cities
for a Better Quality of Life”

20 & 21 SEPTEMBER 2022

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Cities for a Better Quality of Life ”**

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PRELIMINARY TAX STATUS IN LOCAL AUTHORITIES USING GEOGRAPHIC INFORMATION SYSTEM (GIS)

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Abstract

This paper represents a preliminary write-up identify the preliminary of monitoring tax payments as a significant agenda to identify the status of household payments and the amount of income for the month for local authorities. This research method combines fieldwork and spatial data processing. The non-spatial database can be integrated with the spatial database to display the area requested by the users. It can be mapped digitally and analysed through a Geographic Information System (GIS). Preliminary studies show how the coordinate data of each home is observed in the field before being processed in the office. The accuracy of spatial data is a very important element to ensure that the resulting data is accurate and precise. At the end of this research, status payment tax can be monitor daily by utilising a web application. As a result, the analysis will help the user plan and take actions in the near future to address the issue.

Keywords: *Non Spatial, Database, Monitoring, Local Authorities, Tax.*

INTRODUCTION

This study was conducted to evaluate the use of computerised information systems in administrative matters and services. Tax management by local authorities has become more inspiring due to healthy developments. Property tax revenue is the main income for local authorities which is used to pay for services and maintenance in the local authority administrative areas. An assessment tax is a payment made on all holdings or property within the administrative jurisdiction of a Malaysian municipality. Furthermore, information security is always an emphasising issue for an organisation. The hard-copy filing system may cause insecurity or incompleteness of data storage (Yann, L. S. 2015).

The Ministry of Housing and Local Government (KPKT) regulates assessment tax administration under Section 127 of the Local Government Act 1976 (Act 171), which permits the local authority to impose rates on holdings within the Council's administrative territory. Tax payments can be made through a variety of channels. At the local authority level, they have a variety of assessment tax payment options, including going to a payment counter or using online applications.

Assessment tax arrears have recently become a point of debate among local governments. The assessment tax arrears of about RM6 billion is shocking. In 2020, Kuala Lumpur City Hall (DBKL) has a total arrears of RM350 million. In 2017, assessment tax arrears were RM578 million for all Selangor local authorities and RM98 million for Perak

(Berita Harian, 2021). Although many efforts have been made by local governments across the country to reduce the number of assessment tax arrears, it appears that the efforts have not been effective.

A Geographic Information System (GIS) is one of the instruments that assists in the more efficient assessment of tax management. GIS has been proven to be a powerful tool in tax collection and delinquent taxpayers tracking for raising government tax revenue collection (Khan, M. I., 2021). Local authorities that use GIS will be able to see the distribution of taxpayers by actual location. Every payer's data can be identified and observed. With the help of geospatial technology, the decision makers would be able to efficiently plan and execute the property tax collection process with limited resources and staff (Khan, M. I., 2021).

Information such as payment status can be displayed on an interactive map by region (Jensen et al., 2003). Now, statistics are not only seen in tabular form but can be visualised well. The location and information of each payer can be easily analysed according to what is desired. Models and information that flow from this work will be used in future considerations and assessments of this research.

The aim of this research is to study assessment tax in local authority using GIS technology. The objectives of this study are:

- i. To demonstrate data collection using mobile application
- ii. To determine the location of the taxpayer
- iii. To find out how GIS can be used to improve planning and decision-making.

LITERATURE REVIEW

There have been numerous studies on tax assessment, both domestically and internationally. Numerous problems are emerging, particularly in relation to the decreasing collection revenue and rising arrears. However, research into how GIS might be used to track whether a specific property tax has been paid regularly as a solution to this problem is still limited.

A study by Alias, B. (2002) involved all local authorities in Malaysia and found a notion of injustice taxes between payers and local authorities, current market conditions real estate, payer attitudes and levels of enforcement by local authorities affect the collection of assessment tax. His study, however, does not explain in detail specifically what form of enforcement action that is affect the collection of assessment tax. Therefore, this study improved his study by reviewing in more detail the enforcement activities that have been implemented by local authorities.

According to Leslie, E. (2007), there are many methods by which evaluators attempt to convey the results of an evaluation to ensure that they are easily understood by those who intend to use the information. The types of tools traditionally used to present information include stories, graphs, tables, and figures. Geographic Information Systems (GIS) can be used to assist evaluators in presenting the results of their evaluations in a user-friendly way. The utility of GIS will be demonstrated in the context of a neighborhood renewal project. However, the process we describe of using GIS is applicable to all evaluators struggling to portray change within a defined geographical area, regardless of the context.

Leslie, E. (2007) stated that an introduction to GIS for evaluators who have little or no familiarity with representing information spatially. Therefore, the example the researcher chose to present here is purposely simplistic, using GIS primarily to facilitate the visualization of information. GIS can also be used to analyze spatial relationships. For example, by overlaying map layers with different attributes, GIS can be used to identify areas that meet specific criteria for each attribute (e.g., you can identify areas with housing values within a specified range, etc.). GIS can also be used to model spatial relationships.

According to Yaakub, A. R., et al., (2005). good information management methods including data storage and access are very important to help the smooth administration of an organization. related to the problem of enforcement of laws and regulations at the district level, especially local authorities and the Land Office found that one of the issues that cause this problem is the lack of Computerized Information Management System in local authorities.

A study by Lee, H. W. (2009) focused on identifying the problem of rate collection faced by Manjung Municipal Council through 100 questionnaires distributed to respondents in Manjung council. Furthermore, his study identified five methods that can help local authorities overcome the problem of assessment tax arrears by improving the methods of assessment tax collection, enforcement law, verifying the homeowner's address, improving the services provided to people, and improving the way to send bills and notices.

Khan, M. I. (2021) states that the goal of his research is to examine how spatial technology might be used in the taxation system to enhance the accuracy and productivity of property tax assessment processes. The property tax management system would benefit from more uniformity and consistency as a result of the research. Remote sensing (RS) and Geographical Information Systems (GIS) are the technologies for identifying and pinpointing the precise position of properties with pertinent tax features. He said that the digitizing technique used on satellite imagery is more efficient because it is most appropriate and relevant for his study.

According to Singh et al. (2022), globally, more than 130 countries assemble taxes on the assets, and almost all countries consider it a major source of revenue for local governments to administer effectively. Furthermore, emerging countries depend on it more than developed ones and acknowledge the importance of the so-called local tax. In India, many studies have been carried out to lay down the taxation system of the properties. The area-based taxation is based on factors such as location, usage, type of construction, and age of the building. Therefore, many municipal bodies are planning to adopt GIS-based property tax systems to boost their revenues. GIS can provide a system for inputting spatial data and intelligence for planning and monitoring project implementation. GIS is used to locate assets, track information, and save an organisation time and resources.

Based on Ebifuro et al. (2016), their study's objective is to build a spatial and attribute database of unregistered firms as a means of effectively collecting income from the unregistered sector. The study used a technique for combining remote sensing and geographic information systems (GIS) to get locational data using the Global Positioning System (GPS). This study will also conduct a survey in order to determine the tax payer's impression of their choice to remain informal and their desire to pay tax. Even though the majority of business owners have been in operation for more than 11 years, it was discovered that tax compliance in the study area is very low because owners are unwilling to register their companies. The survey results demonstrate that all business owners in the research region are aware of tax payment since they have been told by the Board of Internal Revenue Service (BIRS), friends/colleagues, and the media, despite the fact that the majority of respondents claimed they had never paid taxes.

According to the study, GIS has helped local authorities manage their assessment taxes by promoting efficient planning. However, the current study's map visualisation might be enhanced to make it a more engaging and technologically advanced web application. As a result, the new study, which will be conducted using a web application, will enhance the dynamic map display. All recent research has found that there is no real-time monitoring of whether a particular property tax has been paid or not. The project will involve the integration of geographical and non-spatial financial databases.

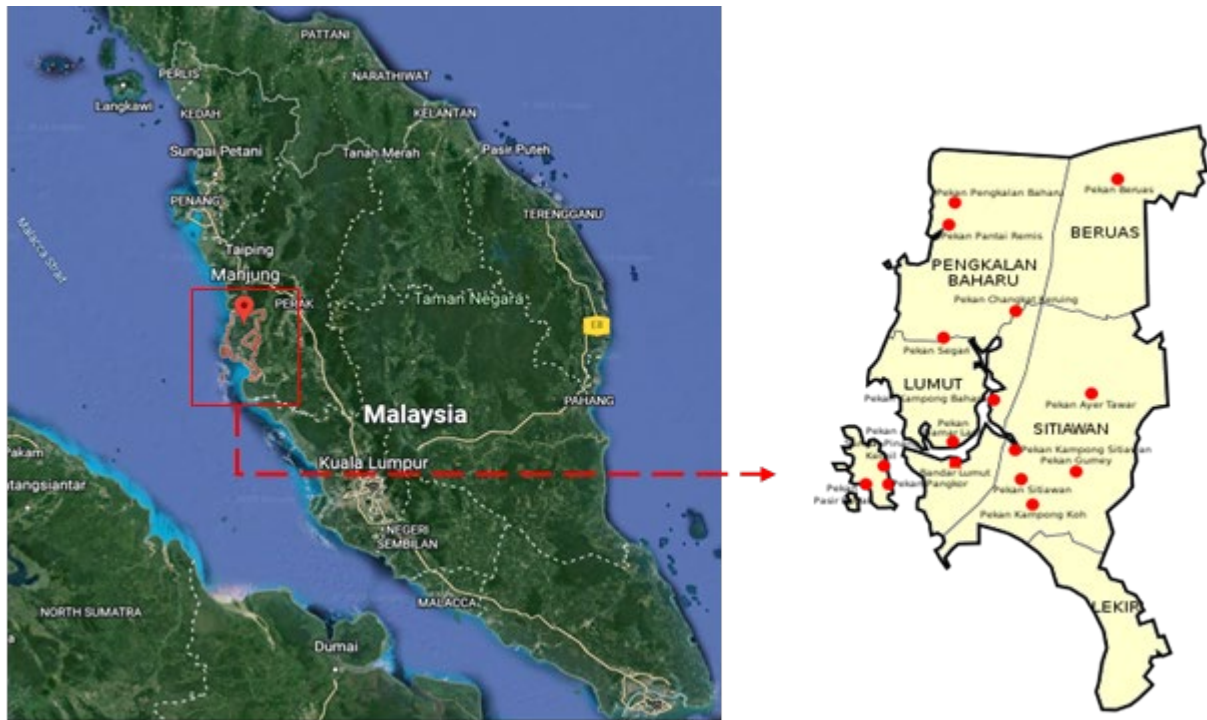
METHODOLOGY

Study Area

This study covers the Manjung District, formerly Dindings. This district is located in the southwestern part of the state of Perak, Malaysia. The district is well associated with Pangkor Island, an attraction in Perak and the home of the Royal Malaysian Navy (TLDM), Lumut Naval Base and dockyard. Dinding was once part of the British Straits Settlements colony. Seri Manjung is the district's principal urban centre while smaller towns include Lumut town, Sitiawan town, Ayer Tawar, Pantai Remis, and Beruas.

Figure 1

Manjung Districts



Note. Figure 1 shows districts of Manjung. (source: Google Maps and Wikipedia)

The major economic sectors in Manjung are agriculture, manufacturing, and the services industries. Agriculture is the main economic sector, making up the majority of the population's employment. Manjung is well known for its livestock production, especially poultry. Sea fishing and fish/prawn farming are the most important economic activities for some community members. At least 5,000 residents are fishermen. Farming of fresh-water fish and prawns is carried out thoroughly in the district. There are more than 300 ponds filled with prawns in operation.

The most popular prawn farming area is along the Dinding River. Manjung District has become the fastest growing district in the state of Perak. Property prices are seeing increases of over 15% in the past few years. In terms of growth of the commercial sector, Manjung is the second fastest growing district in the state, with 5,947 developed units or 13.32%. Many of these businesses and industries are located along the roads connecting Sitiawan, Seri Manjung, Lumut and Ayer Tawar. Industrial and commercial activities are also present in other smaller, neighbouring towns such as Beruas, Pantai Remis, Pekan Gurney, Lekir, and Changkat Kuring.

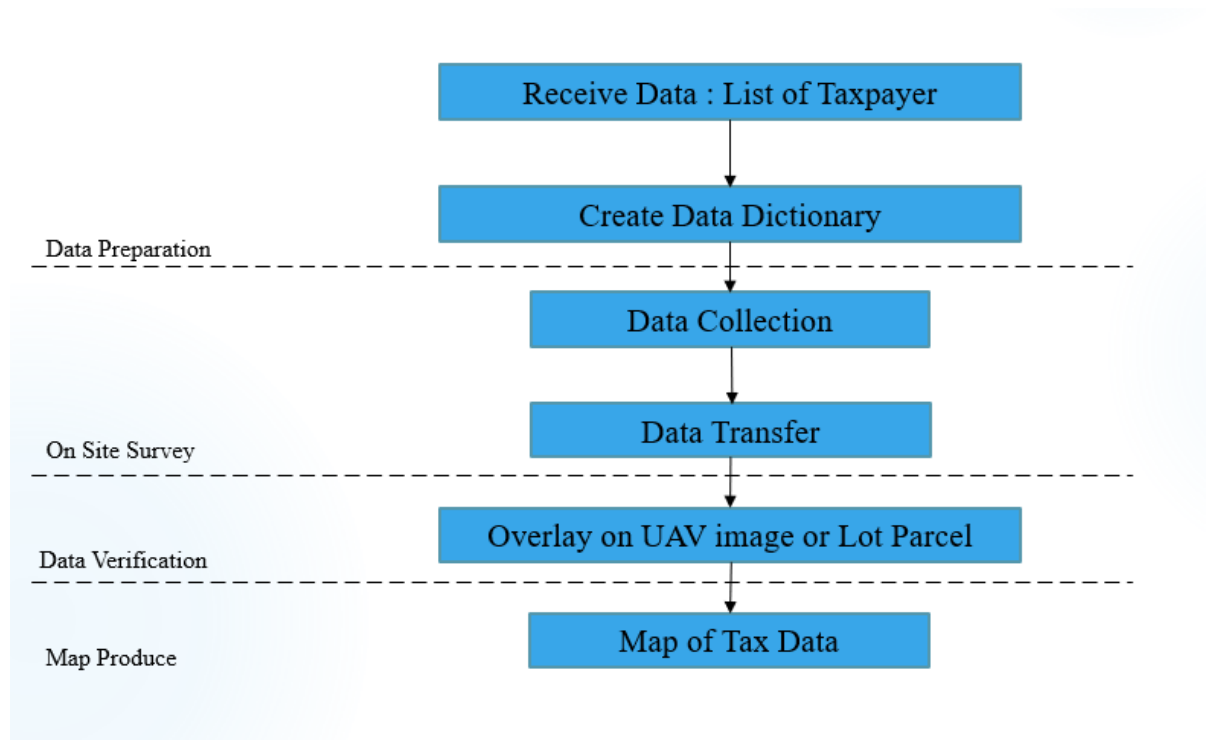
Despite being only 19 years old, the Manjung Municipal Council in Perak demonstrated that it is capable of being titled the best Local Authority (PBT) in Malaysia (Utusan Malaysia). According to the Perak State Socioeconomic Report For 2020, the Municipal Council Manjung earned the most in 2019 for the category group of municipalities in Perak, totaling RM100.7 million. At the same time, Manjung Municipal Council had the highest surplus in the Perak municipal council group, totaling RM9.9 million. Therefore, to continue operating as the top PBT in Malaysia in the upcoming year, a study of how GIS can assist the Manjung Municipal Council manage administration is crucial.

Data Acquisition

Data collection and GIS processing will be carried out. To ensure that the data quality is accurate, a data assessment must be performed. Figure 2 shows the methods that will be used throughout this study. It starts with data collection from a chosen local authority.

Figure 2

Research Methodology



Note. Overall Methodology

The preliminary study investigation will begin by obtaining a list of taxpayer data from local authority. Address, number of payments and arrears, race, land category, and payment status are among the details provided in the list. Lists of taxpayer information are non-spatial data. Therefore, there is a need to execute some work in order to transform this data into spatial data.

Site data collection will be carried out to obtain the taxpayer's exact location. This data observation activity will be carried out utilising a GNSS application with a 3-5 metre accuracy. Site data collection will be conducted using the Locus Map application. The multi-purpose Android navigation app Locus Map gives Android smartphones advanced online and offline GPS capabilities. The application allows the easy and fast collection and updating of geodata directly in the field, using a phone or tablet running on the Android operating system. Adding

to the advantage, field data can be collected even without the need for an Internet connection. Depending on the user's smartphone model, the Locus Map application's geolocation accuracy varies. According to Gabryszak (2020), the mean standard deviations of horizontal coordinate determinations made using mobile phones ranged from 2.84 to 5.04 m for Android devices.

Figure 3

Locus Map Application for Smartphones and Tablets



Note. Figure 3 shows the point features overlaid on base map using smartphone and GIS tablet view with polygon feature display. (Source: <https://gisresources.com/>).

The standardisation of data structures, coordinates, and formats should be specified while creating a layer. The data structure needs to take into account what information is to be extracted at the end of this research. All data will be standardised using the same map projection, i.e., WGS84. The GIS data format will be selected according to the suitability of the data to be displayed.

The data will be analysed and cross-checked against other data sources for accuracy. Preferably, taxpayer data will be overlaid on JUPEM's cadastral lot and unmanned aerial vehicle (UAV). Spatial adjustment is required to relocate the taxpayer's position using GIS software to a point that is not accurate.

RESEARCH SIGNIFICANCE

It would be great if the local authorities could track the location of every taxpayer and obtain information about them. GIS also makes it easier for local authorities to monitor specific areas and report them to higher levels more promptly and effectively. As is well known, taxpayer data is stored in a non-spatial database. Currently, assessment tax data is stored in a non-spatial database that cannot be shown on a map. Accordingly, to achieve the study's objectives, data collection and GIS data processing must be implemented. The Land Information Management System developed with the use of GIS software has significant advantages over the existing system (Leelananda et al., 2016). This model will take the form of a taxpayer-friendly concept that will transform Malaysian local governments' current collection performance into effective tax revenue collection.

DISCUSSION AND ANALYSIS

At the end of this research, taxpayer data will be analysed by GIS software. It can be used to do a variety of analysis, whether they are evaluated by geographical or non-geographical elements. The inclusiveness of the data is required during data analysis. One of the types of research that might be offered in this preliminary study is the characteristics of

taxpayers based on their payment status. This model will be in the form of a taxpayer-friendly concept or model that will change the current collection performance and arrears of property taxes in local authorities, thus ensuring the effective tax income collection by local authorities in Malaysia. The outcome of this research is expected to be a workable model that is able to overcome the deficiencies of the existing model as well as having the ability to measure current and future needs accurately. With a working model for the efficient management of property taxes, revenues will be maximised through the outstanding performance of local authorities and arrears will also decrease. Thus, with high yields, local authorities will be able to implement and fulfil the desires of taxpayers for the provisioning of appropriate.

Figure 4

Expected Result for Status of Assessment Tax



Note. **Figure 4** shows the web application of payment status for individual properties. The green colour shows units where tax for the current year has been paid and nonpayers have been shown on the map with the red color. (Source: <https://lup.lub.lu.se/luur/download?func=downloadFile&recordOid=9043807&fileOid=9043823>).

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Tarikh : 20 Januari 2023

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Kelulusan daripada pihak tuan dalam perkara ini amat dihargai.

Sekian, terima kasih.

“BERKHIDMAT UNTUK NEGARA”

Saya yang menjalankan amanah,

SITI BASRIYAH SHAIK BAHARUDIN
Timbalan Ketua Pustakawan

nar

Setuju.

27.1.2023

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