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Geographic Information System Using Postgre SQL-QGIS for Slum Squatter Distribnution Mapping in North Jakarta

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Abstract: This research aim to build a geographic information system that displays a mapping of slum building distribution in North Jakarta. One of spatial software was developed using a method is the Rational Unified Process (RUP) method. This research aim to build a geographic information system that displays a mapping of building distribution in North Jakarta. This system was built using Postgre SQL and QGIS to build map. The research finding in the research is that there is a tendency for built-up areas to grow in slum areas due to the absence of rental fees, land and building costs, but the feasibility conditions of these areas are very unsuitable. This research is limited to implementing the use of Postgre SQL and QGIS software. Because the rendering process for the visual display is very difficult. I hope that in the future this research will be developed interesting 3D visualization accompanied by charts. The implication of this research is to make it easier to see the distribution of dense and slum areas and become a step for the government in making policies. The originality of this research is that there is still no one who combines the two software in mapping analysis.

Keyword: Building, development, growth, programming

INTRODUCTION

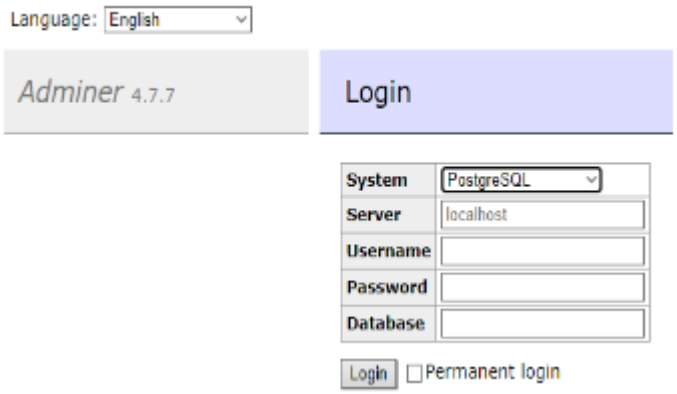
Jakarta is one of the biggest city in Southeast Asia. Its city has many problems especially in population. This population is always increasing and experiencing overpopulation. It is currently recorded that Jakarta will have a population of more than 10 million people in 2024(Markieta, 2022). This is also densely packed with commuters who work every day with more than 4 million people. This condition makes the need for housing

quite high (Aji Bayu Prasetyo & Alfa Susetyo, 2022). The need for housing has caused land prices in Jakarta to soar (Zhou et al., 2016). At the end of the 2000s, land prices in Jakarta were the highest in Indonesia apart from Surabaya and Bali. The increasing price of land and housing means that people have little opportunity to live on decent land or space. It is recorded that many settlements and villages have sprung up on riverbanks, railroad tracks and bridges and on the outskirts of ports. What is most of concern in this study are dense settlements and urban areas in the north of Jakarta (Ruslan Rainis, 2013). This densely populated village in North Jakarta appeared decades ago. Apart from the existence of Tanjung Priok as one of the main ports in Indonesia. Many people are competing to earn a fortune at this port, either as drivers, ship crew, shipyard officers and so on.

Picture 1. Slum settlements condition in North Jakarta

Picture 1 explains the condition of slum settlements in North Jakarta(Christiono & Sama, 2020). This housing condition is very inadequate. Where sanitation and clean water are very dirty. Apart from that, North Jakarta is vulnerable to flood disasters and also land subsidence. Postgresql and QGIS are software for online data databases and map processing. Postgres software was developed by the University of California at Berkeley Computer Science Department. This software is supported by many platforms and is open source. After completing the database creation, this application will be collaborated with QGIS in analyzing slum settlements in North Jakarta.

Picture 2. Postgresql login page

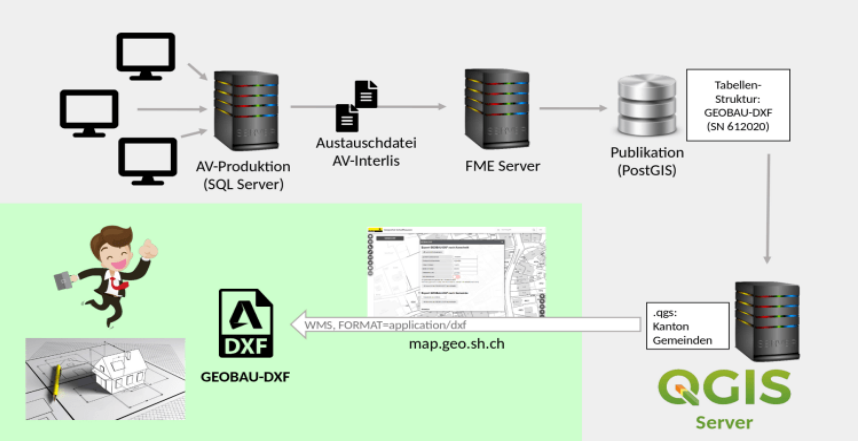


Picture 2 explains logging into the database server in Postgresql SQL. Postgre is very necessary for creating large capacity spatial data..

METHODS

This method is written in descriptive and should provide a statement regarding the methodology of the research, include the type of research, research approach, a source of data and analysis method. The author should explain the mechanism to analyze the sharia issues. This method as much as possible to give an idea to the reader through the method used, this method is optional, only for an original research article. (For Conceptual Ideas without Research Method)

Picture 4. Postgre SQL and QGIS Flowchart for Database and Analysis

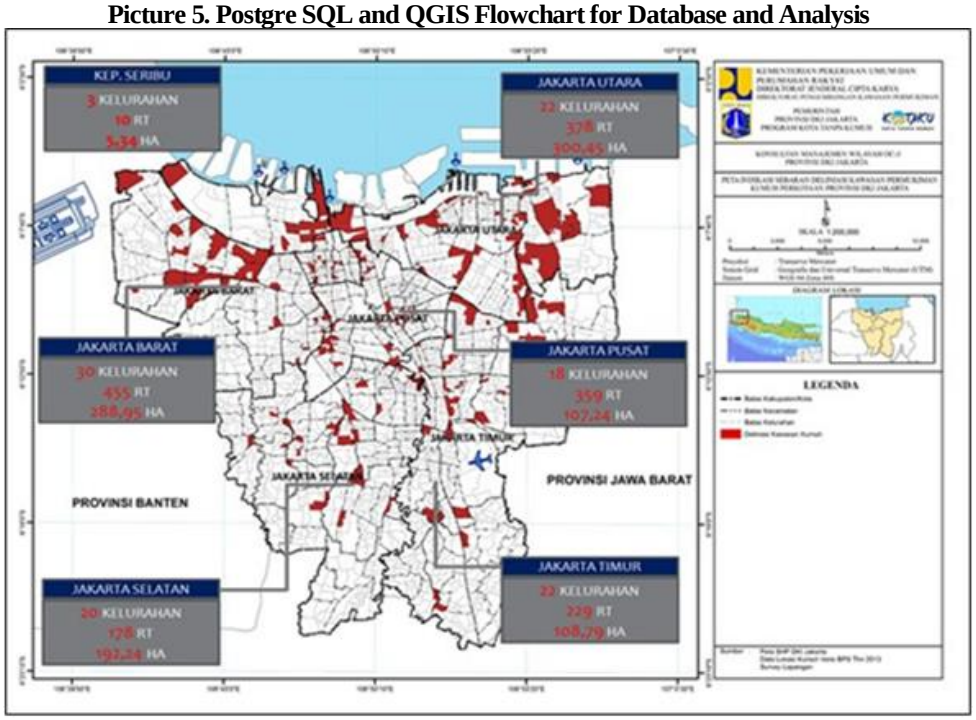


Picture 4 explains that Postgre SQL was integrated with QGIS database server. After the data acquisition process. Then the data will be collected in storage in Postgre SQL. After that, the new data was processed using QGIS in spatial analysis of the distribution of slum settlements in North Jakarta.

RESULTS AND DISCUSSION

Poverty is a welfare-related problem that will impact several other aspects of life. Poverty indicates that people's ability to fulfill their basic living needs is still limited. Poor residents in DKI Jakarta generally live in slum areas that have inadequate environmental quality and physical buildings. Poverty in DKI Jakarta from 2017 to 2018 decreased from 3.77% to 3.57%. The highest number of poor people is in North Jakarta, where in 2018 it reached 95 thousand people. Poor people in general are also low-income people who can get access to housing assistance from the government. North Jakarta has a poor population of 99,310 people in 2022 and 95,860 people in 2023. With a percentage of 5.59% in 2022 and in 2023 it was 5.35%. Figure 5 shows the distribution of slum settlements in Jakarta. North Jakarta has slum areas of 22 sub-districts.

Picture 5. Postgre SQL and QGIS Flowchart for Database and Analysis



Picture 5 show that household ownership status is an indicator to provide an overview of people's ability to access owned housing. North Jakarta welfare statistics data for 2023 shows that 45.33% of households own a house with self-owned status from male heads of household, while

60.22% for female heads of household. Meanwhile, for non-owned houses with male heads of household it was 54.67% and for female heads of households it was 39.78%. The ownership status of a non-own house can be in the form of a rental house, official residence or other forms. The high level of non-own ownership in Jakarta is due to the large number of houses provided on a rental basis by the government to address the high need for housing, especially for low-income people. One form of housing with a rental scheme is rental flats provided by the government.

The condition of the housing environment can be assessed from the use of defecation facilities. The majority of defecation facilities owned by households in North Jakarta are their own, around 83%, and the remainder use other defecation facilities such as communal facilities provided by the government. Final waste disposal sites in this province are also dominated by households that use septic tanks, IPALs and SPALs. The DKI Jakarta government has provided these facilities which are provided on a communal basis that reaches the North Jakarta area.

Picture 6. Settlement Distribution [above] and Slum Squatter Map [below]

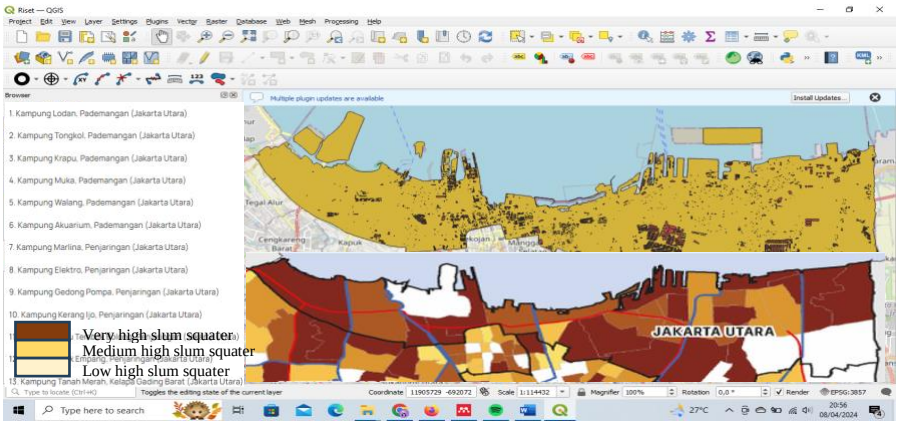


Figure 6 above explains the distribution of slum settlements in North Jakarta in 2023 using digitization and analysis using QGIS. Meanwhile, the image below shows the level of urban sprawl in North Jakarta with a very brown color. Several lists of slum settlements are written on the left side of the map, including Kampung Aquarium, Kampung Lodan, etc.

CONCLUSION

The conclusion that can be drawn is that Postgre SQL and QGIS software can be collaborated to create spatial data and analyze it accurately. Slum settlements in North Jakarta will increase by 99,310 people in 2022 and 95,860 people in 2023, the largest in 13 villages or 22 sub-districts.

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