

The Use of Webgis as an Implementation of Smart Sustainable Cities Concept in Parepare City, South Sulawesi

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Abstract. The New Urban Agenda will focus on Smart Cities and Sustainable Cities. The smart city is a smart city concept designed to support various community activities and provide easy access to information for the public. Under the smart city agenda, presently, many government agencies are attempting to engineer an urban transformation to tackle urban prosperity, live ability, and sustainability issues mostly through the means of technology solutions. This study aims to formulate a website on land use. The method used in this study begins with a study of the literature to find indicators for Smart City. After determining the indicators and benchmarks for the smart city of Parepare City, the survey of the required data is carried out, the processing of survey data and the analysis and evaluation of current conditions. After learning about the current state of the city of Parepare, the website-gis formulations were carried out as one of the instruments of the smart city. Smart City is one of the new city development and management strategies. This WEBGIS displays the distribution of land use. This model should be a tool used by the Municipality of Parepare to develop land use policies.

1 Introduction

Ecological, social and financial emergencies have happened on a worldwide scale since the mid-twentieth century, which has influenced the lives of our kin [1]. Metropolitan territories around the globe have constructed and improved urban framework and administrations, as a fascination and seriousness of urban areas [2]. The pattern towards worldwide urbanization makes an earnestness to discover more brilliant approaches to deal with the difficulties that go with it [3]. Populace development presents difficulties to urban foundation, administrations, for example, water, vitality, transport, and others, just as the administration of framework and administrations [4]. Worldwide urbanization and the difficulties of maintainability add strain to the urban framework. Another perspective, with an accentuation on the frameworks point of view, will be expected to defeat this test [5]. Given the global scale and the impact of urbanization, and the difficulty of tackling urban challenges by local governments acting on their own, the United Nations Open Working Group on Sustainable Development has devoted 1 " one of the 17 Sustainable Development

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Goals (SDGs) to replace the Millennium Development Goals (MDGs) when they are completed in 2015 in urbanization. More specifically, the content of ODD11 aims to "make cities and human settlements inclusive, safe, resilient, and sustainable" [6].

The growth of a prosperous world population over the past 50 years has been the development of a prosperous total populace in recent years has been marvelous. Since the quantity of huge urban communities is expanding quickly, a large portion of them doesn't create. An urban extension is generally higher in rural territories because of the accessibility of the farming area. Be that as it may, this development doesn't happen consistently in every rural zone [7]. A technique dependent on the arranging and usage of coordinated measures for manageable country improvement is vital [8]. This has achieved changes in urban and country land-use designs just as the issue of extending framework extension in India. The size of urban development designs presents genuine social and financial issues that impact affect urban foundation [9]. The size of the urban populace has squeezed essential enhancements, for example, wellbeing, training, water, power, media communications, transport, and so forth. So there is no uncertainty this is one of the fundamental concerns influencing the improvement of the nation in the 21st century. Town arranging can be considered as a perplexing and dynamic framework that requires uncommon procedures to oversee regional change [10].

Shrewd urban communities must speak to interconnected, maintainable, agreeable, alluring, and safe advancements [11]. Savvy urban communities use city information to advance city administration capacities [12]. This reality supports the utilization of innovative assets for the administration of urban administrations [13]. The improvement of the city triggers financial advancement as an inside for capital, work, information, data, and innovation. In any case, worldwide urban communities likewise face many significant difficulties, including traffic clog, a startling turn of events, helpless guidelines of land use, and absence of essential administrations. The need to build up a brilliant domain is a worldwide test.

The arranging of lodging zones is something critical to consider in urban arranging, particularly in Indonesia where urbanization from country zones to urban communities is extremely high. Every year, numerous individuals look for the abundance of the city, with the goal that urbanization will consistently remain. Moreover, as indicated by the ongoing city highest point in Indonesia, it is assessed that by 2050, 70% of the national populace will live in urban territories [13]. Thus, the lodging region will be thick, which doesn't relate to the arrangement of sufficient offices. On the off chance that the zone is clogged and without satisfactory help offices, this can cause a few issues in the region. As of late, different arrangements have been proposed to battle the issue of the outcomes of impractical urban arranging. This incorporates embracing another worldview to make urban areas increasingly practical, tough, and more astute - and thusly produce thriving, fundamental abilities, and prosperity for residents, and make urban communities all the more naturally well disposed. the earth [14].

To get an "insight" in the six estimated classifications, every city needs a reasonable and worldwide technique [15]. Altogether, a widespread fixed framework for shrewd urban communities might be hard to characterize with the assortment of qualities of urban communities around the world. In any case, it has been clarified that the definitions presented by specific urban areas calling themselves 'savvy urban communities' need all-inclusiveness. A brilliant city evaluation must consider that urban areas have various dreams and needs for accomplishing their goals, and that each urban focus must advance an incorporated improvement of various parts of savvy framework [16].

Parepare City is one of the urban areas in the region of South Sulawesi, whose populace development has risen altogether. The state of land spread in the investigation area changes essentially, it very well may be seen from the guide of shading changes that show changes

in non-rural territories that are getting greater. The territory of settlements in the Municipality of Parepare in 2019 is 961.70 ha, while the zone of green space is separated into six sections, to be specific: open land, bush, timberland, while the bit is: open place where there is 1121.77 ha, bush zone of 776, 52 ha, woods as much as 1731.07 ha, burial ground as large as 21.87 ha, mangrove as large as 3.12 ha, while green space inclusion is 22.36 ha.

Land use for horticulture in 2018 is partitioned into three sections: 959.47 ha of farming area, 568.20 dry land agribusiness and 3032.97 ha of blended nursery. Land for creature farming is partitioned into two sections, in particular: animal cultivation of 43.83 ha and lakes of 86.77 ha. Hydrological land in the city of Parepare in 2019 is isolated into two sections, to be specific: body demeanor of 3.97 ha, stream region of 83.63 ha. Land use for offices and framework is isolated into twelve sections with an all-out territory of 154.45 ha. Other land utilizes in the Municipality of Parepare are barrier and security at 12.89 ha. Industry and exchange are isolated into two sections, to be specific: exchange of 28.58 ha, exchange of 28.58 ha and different enterprises of 17.55 ha. While the utilization of land for mining covering a region of 35.56 ha.

The issue of land-use change is not new, but new things are needed to make a breakthrough towards a smart city. The smart city indicator that will be used in this research is the smart environment. The implementation of a smart city to control the residential environment is used effectively, identifying cultivation areas and protected areas that are in line with the guidelines of the land-use plan. The GIS website is an information technology instrument that can be used to implement a smart environment for the implementation of a smart city in a separate city.

2 Materials and methods

2.1 Research location

The total area of the City of Parepare is $\pm 99.33 \text{ Km}^2$, and administratively it is divided into four districts namely West Bacukiki District covering six villages, namely Bumi Harapan Village, Cappa Galung, Kampung Baru, Sumpang Minangae, Tiro Sompe and Lumpue. Bacukiki sub-district covers four sub-districts namely Lemoe, Lompoe, Watang Bacukiki and Galung Maloang. Ujung District covers five villages namely Mallusetasi, Labukkang, Lapadde, Ujung Bulu and Ujung Sabbang. Soreang sub-district covers seven districts, namely Bukit Harapan, Bukit Indah, Pisang Village, Lakessi, Ujung Baru, Ujung Lare and Watang Soreang. A picture of the boundaries of the City of Parepare can be seen at.

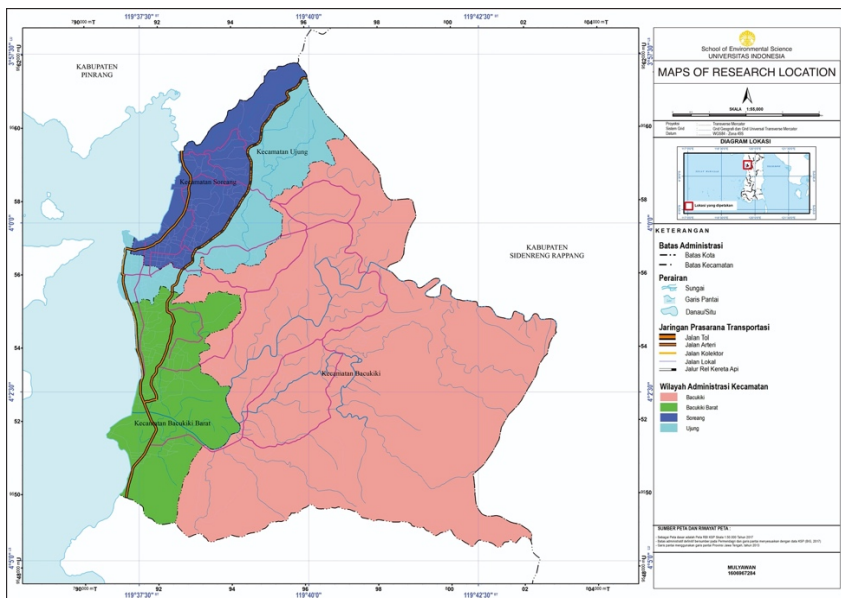


Fig.1. Research Location

2.2 Study method

2.2.1 Data Collection

The collection of primary data is done through direct interviews with shareholders associated with Smart City who have the capacity to answer questions related to the phenomenon under study, which in this study is the process of construction and management of the cities of the city of Parepare towards smart cities. Interviews are conducted openly, so that the information obtained is more numerous, not limited to the answers to certain questions. In addition, a secondary data meeting also took place. Secondary data to be collected can be planning documents, financial statement reports, administrative documents, official announcements, media articles, as well as other written documents containing information about Smart City studies that are in the study. Secondary data can be obtained from various government agencies (linked to the SKPD) or from non-governmental organizations that have the necessary data during this study. In addition, secondary data can also be obtained from certain official websites on the Internet.

2.2.2 Data analysis

In this study, the analysis used is to identify the position of local government in Parepare City in policy development, program planning and activities with the Smart City concept. This arrangement also pays attention to the experiences of cities abroad, as well as within the country towards Smart City, especially for comparison or to take lessons and experiences from other cities.

The different programs are then grouped into appropriate categories, for example including infrastructure, government, human resources, the environment, the economy, public services, disaster management and transportation. From each area, the categories are again organized paying attention to the order of time, drawn with a chronology in order to see which programs are executed earlier than the others. In addition, it is also necessary to

identify the conditions of the city of Parepare related to the seven dimensions of the smart city, namely the smart economy, smart people, smart governance, smart mobility, smart environment, intelligent life and intelligent disaster management. The results of the identification will be used to formulate Smart City indicators in accordance with the conditions of the city of Parepare. Thus, the preparation of the roadmap for this study should be clearly visible, in particular for how long and when the city of Parepare can actually implement the Smart City.

3 Results and discussion

3.1 Land availability for settlements

Based on the treatment of the 2013 spatial model map overlay with the Parepare City land cover map in 2018 in this study, it was found that the availability of land for colony development is 1216, 45 ha, and the current settlement area of Parepare City is 961.70 ha and the total area of land for the colonies. is 2178.15 ha in accordance with the development plan of the city of Parepare 2011-2031. The map of the availability of residential building land is presented in Figure 4.30. Currently the city of Parepare. The city of Parepare is divided into 4 districts and consists of 22 villages. This study shows that the district with the greatest availability of land is Lemoe of 248.57 ha, and the lowest level of availability of residential land is the Ujung Sabbang district of 0.14 ha. The results of this study show that out of 22 districts, there is 1 district who no longer has land for the development of colonies, namely the village of banana trees district, Soreang district. Population growth is high, so that land use for residential areas will also be high and increasing. The Banana Village is the most populous village in the Soreang district with a population of 3,296. Land availability for settlements can be seen Fig2.

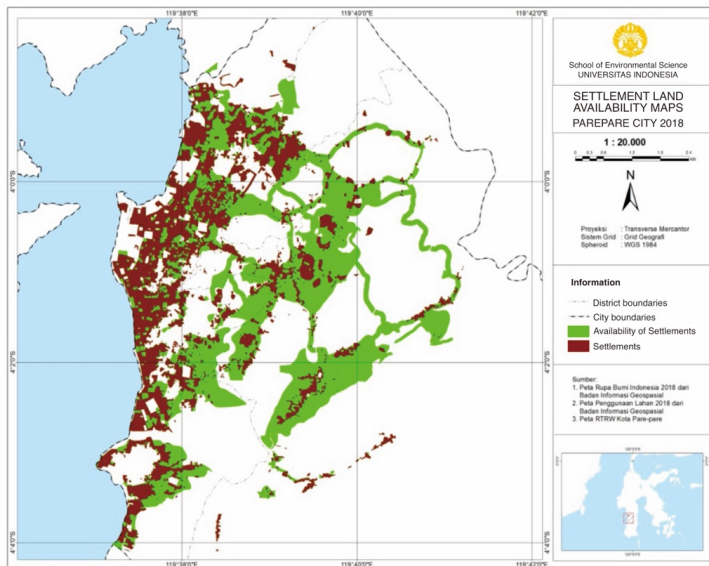


Fig. 2. Land availability for settlements

3.2 The practice of smart cities in Parepare city

For the time being, sustainability becomes a basis of development in every single area. Our Common Future, stated in Brundtland Report, defined sustainable development as strategies that meets the present needs without compromising the ability of future generations to meet their needs. According to Nair 'meet the present's needs' refers to sustainability of development aspect, i.e. economic, social, cultural and political issues. Whereas 'without compromising the ability of future generations to meet their needs' refers to environmental aspect. Smart City concept focuses on providing the infrastructure services and utilities to urban settlements with the integration of the modern technology (ICT) with the aim to improve the quality of living [17].

The concepts of sustainability and sustainable development have been applied to urban planning and design since the early 1990s, thereby the emergence of the notions of urban sustainability and sustainable urban development. Urban sustainability denotes a desired state in which the urban society strives for achieving a balance between environmental protection and integration, economic development and regeneration, and social equity and justice within cities as long-term goals through the strategic process of sustainable urban development as a desired trajectory. Thereby, it seeks to create healthy, livable, and prosperous human environments with minimal demand on resources (energy, material, etc.) and minimal impact on the environment (toxic waste, air and water pollution, hazardous chemicals, etc.), to draw

Cities that are called smart cities are cities that initially have new breakthroughs in solving problems in their cities, and successfully improve the performance of their cities. The development of the concept of smart city indeed brings a better understanding in terms of technology, this is not wrong if in its application still sees other aspects that are also needed by a city in general, then these aspects are considered as a whole as a whole until it can be called a city intelligent. Application of the concept of smart city by utilizing technology and communication to realize better community services. This study discusses the concept of smart city by using the GIS website, to evaluate the development of settlements in the city of Parepare.

The application of webGIS in an urban setting has many functions. One of the main functions of the application of webGIS when viewed in terms of government, in this case the Regional Development Agency (BAPPEDA) is related to spatial planning. WebGIS can also be used by governments to distribute information to the public. If viewed from the side of use by the community, webGIS will help the community a lot in finding the location of urban infrastructure because it can be accessed from anywhere. Through the use of this application, planners or designers can balance the amount of density in the area with the provision of necessary facilities in a very short time [18]. This empirical research work shows that developing countries' growth in the IT field needs to be situated improve in terms of the quality of Internet features [19].

3.3 Application System Design

The city of Parepare webGIS design in this study was built using the open source admin-LTE template as a base page interface and uses the Google maps API framework to build layers and geographical information system features on webGIS pages. In general, this system implements jQuery, JavaScript, and CSS functions to enhance your appearance. Bootstrap CSS is a CSS framework that is used in building this application system, thus allowing the application system to adjust to the screen size of various devices used (responsive). The design of this application system as a whole can be translated into two

main parts, namely: Building a webGIS system design architecture that explains the relationship between back-end and front-end as a whole.

1. Build a webGIS php page framework with expressive and elegant syntax using Bootstrap CSS. In addition, support for the use of jQuery and JavaScript functions is also added for the sake of system effectiveness.
2. Building a webGIS page based on the Google maps API V3 script with various features available

The webGIS architecture design of the geospatial information infrastructure of the city of Parepare. Bootstrap is a framework for building responsive web design. That is, the web display created by Bootstrap will adjust the screen size of the browser used both on desktop, tablet or mobile devices. Here is a map of the overall webare city PIS framework. WebGIS pages that are built still use page panels such as on the home page, man page, and data page. Following is the display of the Parepare city webIS page and the Google maps API script functions that are implemented to produce it. webgis home can be seen in Fig 3.

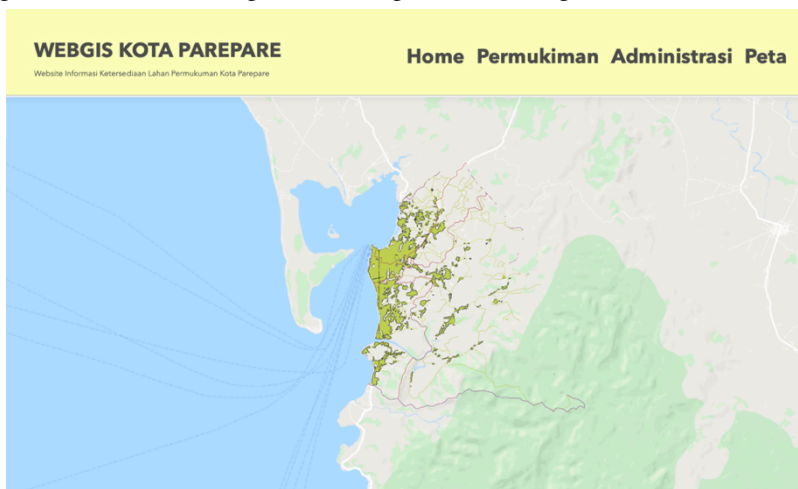


Fig. 3. Webgis Home

Parepare webGIS display in this study was designed using Bootstrap CSS. Bootstrap is a framework for building responsive web design. That is, the web display created by Bootstrap will adjust the screen size of the browser used both on desktop, tablet or mobile devices. The following is the settlement and worship page providing available geospatial data on the residential areas and Parepare City Worship houses. The data raised is dynamic data that is raised in accordance with the webare database of the city of Parepare. On this page are available seven subpages consisting of government office data, educational facilities, health facilities, worship facilities, banking, tourism, and road networks. Feature of webgis home can be seen in Fig 4.

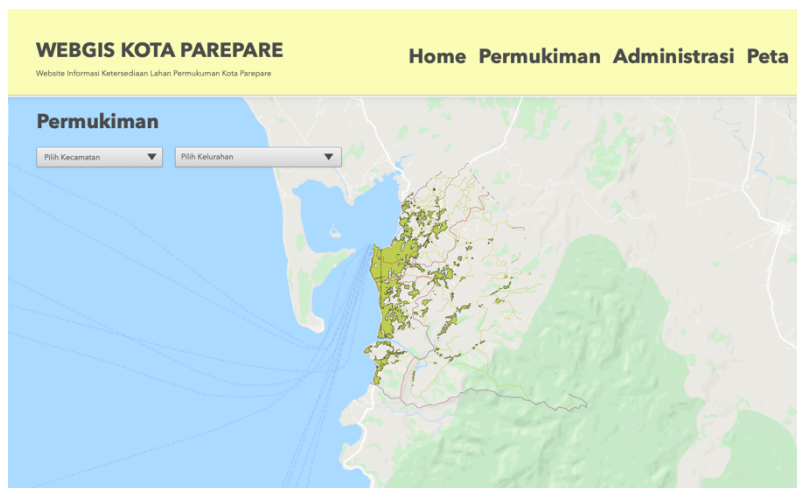


Fig.4. Feature of Webgis

The use of attractive and good interface design makes users feel comfortable when using webGIS in the city of Parepare. The design of a web-based geographical information system is clearly very easy for users to get access to geospatial information in real time. The use of a web-based geographic information system allows users to access the webGIS anytime, anywhere, and with any type of device connected to the internet.

4. Conclusion

The design of a web-based geographical information system is clearly very easy for users to get access to geospatial information in real time. The use of a web-based geographic information system allows users to access the webGIS anytime, anywhere, and with any type of device connected to the internet. This Websitegis application is expected to help the city of Parepare in making policies related to land use.

Acknowledgment

This Research is funded by the Grant of Indexed International Publication for Final Project of Magister Students from Directorate of Research and Community Service, Indonesia University number NKB-1021/UN2/R3.1/HKP.05.00/2019.

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