

The Management of Land Assets in Dharmasraya Regency Based on WebGIS

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ABSTRACT

WebGIS is a system that can connect to the internet and is utilized for collecting, storing, and displaying georeferenced information without GIS software. Despite the rapid development of WebGIS, it has not been optimally utilized by the government of Dharmasraya Regency for asset management. This research aims to map the spatial and non-spatial data distribution of land and building assets owned by the Dharmasraya Regency government and to present the visualization of land assets based on WebGIS. The research reveals that the government's land assets, spread across 11 districts, amount to 246 assets, with the highest of number in the Sitiung District (59 assets) and the lowest in the Asam Jujuhan District (5 assets). In terms of land area, the widest distribution is in the Koto Baru District (289.93 hectares), while the narrowest is in the Asam Jujuhan District (4.23 hectares). Based on usage classification, land asset management is primarily employed for educational purposes (110 assets). The WebGIS is designed by QGIS application, and storage and published using Github and Netlify services, with the results presented on the Dharmasraya Regency Perkimtan Department's website

Keywords: Asset management, land assets, WebGIS,
Dharmasraya Regency

1. Introduction (11 pt, Sentence case)

In general, assets refer to anything that has the potential to generate economic value in the future [1]. In governance, government assets refer to the wealth, properties, and resources managed and owned by government entities. Government assets can include land or buildings owned by the government, such as schools, government office buildings, sports facilities, hospitals, health centres, and public infrastructure like waterways, roads, electrical networks, and bridges [2].

Since the establishment of Dharmasraya Regency based on Undang-Undang No. 38 Tahun 2003 [3] to the present day, the list of assets owned by this regency amount to 672 plots of land [4]. From the data obtained, the management of land assets has not been running optimally. In response to the land asset issue, asset management can be the appropriate solution in land asset management. Asset management demands a deep understanding of asset management that not only considers the condition and problems of assets but also strives to capture opportunities in managing and preserving land assets in the future [5]. Data collection is one part of the regional asset inventory process.

Considering the importance of data collection and asset presentation to make it easily understandable and effective, and since asset inventory has been in analogue form so far, the use of Geographic Information System (GIS) applications is highly needed for this research [6]. The Geographic Information System is beneficial for depicting the distribution of land assets owned by Dharmasraya Regency's government, which can provide an evaluation of government-owned land assets by utilizing visualizations of asset locations, making it easier for Dharmasraya Regency's administration to manage land assets.



2. Development method

The system development of this research can be observed in Figure 1 below which is divided into three steps: preparation, data processing and web design.

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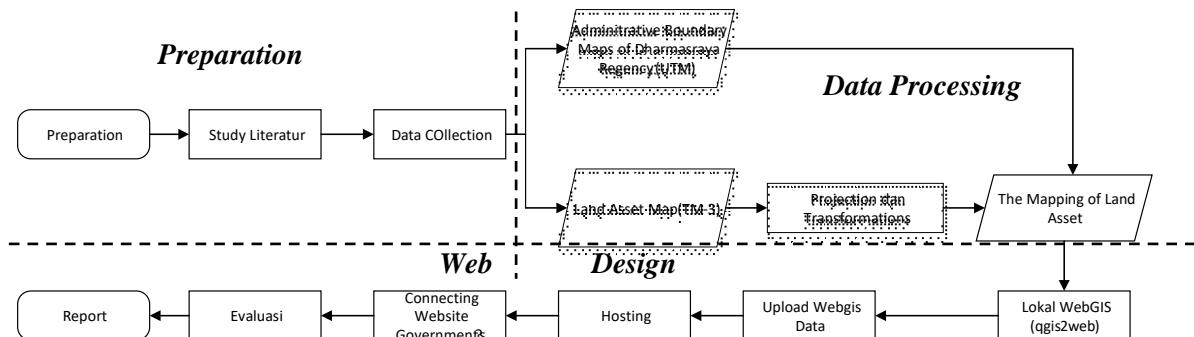


Figure 1. System Development

2.1. Preparation

The first stage in this research is to create a request letter for data from the government agency that owns the survey data of government-owned land assets in Dharmasraya Regency. This data is obtained from Badan Pertanahan Nasional in Dharmasraya Regency. Additionally, coordination will be carried out with the Dinas Pekerjaan Umum dan Tata Ruang in Dharmasraya Regency to request administrative maps for Dharmasraya Regency.

2.2. Data Processing

During the data processing phase, the results of coordination with relevant agencies yield land asset data owned by the Dharmasraya Regency government with TM3 coordinates and administrative maps of Dharmasraya Regency with Decimal Degree coordinates. To enable the overlay of these two datasets, coordinate transformation is performed. The land parcel map obtained from the National Land Agency is transformed from TM3 to decimal-degree coordinates. Once the maps share the same coordinate system, they are overlaid, and data attributes for each land parcel are then filled in as shown in Figure 2. The data attributes that are populated in each land parcel include Object Name, Object Area, Object Location based on Nagari and District regions, Certificate Issuance Date, and Land Identification Number (NIB). Here are the results of the attribute table and the distribution map of land assets owned by the Dharmasraya Regency Government (Figure 3).

Aset Tanah Kabupaten Dharmasraya — Features Total: 246, Filtered: 246, Selected: 0						
	Nama_Objek	Luas	Nagari	Kecamatan	Status	Hak
1	Bangunan Gedung Sekolah Menen...	Luas 14990 m2	Nagari Sikabau	Kecamatan Pulau Punjung	Bersertifikat	Hak Pakai No. 01
2	Bangunan Instalasi Sarana Air Bersih	Luas 2000 m2	Nagari Koto Baru	Kecamatan Koto Baru	Bersertifikat	Hak Pakai No. 04
3	Broodstock Center Sungai Dareh	Luas 22943 m2	Nagari Sungai Dareh	Kecamatan Pulau Punjung	Bersertifikat	Hak Pakai No. 10
4	Broodstock Center Sungai Dareh	Luas 48217 m2	Nagari Sungai Dareh	Kecamatan Pulau Punjung	Bersertifikat	Hak Pakai No. 11
5	Embung Nagari Koto Ranah	Luas 22702 m2	Nagari Koto Ranah	Kecamatan Koto Besar	Bersertifikat	Hak Pakai No. 07
6	Embung Nagari Koto Ranah	Luas 12587 m2	Nagari Koto Ranah	Kecamatan Koto Besar	Bersertifikat	Hak Pakai No. 06
7	Embung Nagari Kurnia Selatan	Luas 15000 m2	Nagari Kurnia Selatan	Kecamatan Sungai Rumbai	Bersertifikat	Hak Pakai No. 02
8	Embung Nagari Kurnia Selatan	Luas 15710 m2	Nagari Kurnia Selatan	Kecamatan Sungai Rumbai	Bersertifikat	Hak Pakai No. 03
9	Fasilitas Umum	Luas 25810 m2	Nagari Sungai Duo	Kecamatan Sitiung	Bersertifikat	Hak Pakai No. 186
10	Fasilitas Umum	Luas 4749 m2	Nagari Taratak Tinggi	Kecamatan Timpeh	Bersertifikat	Hak Pakai No. 05
11	Fasilitas Umum Jorong Balai Tangah	Luas 6646 m2	Nagari Sungai Rumbai	Kecamatan Sungai Rumbai	Bersertifikat	Hak Pakai No. 7
12	Fasilitas Umum Jorong Batas Baru	Luas 8149 m2	Nagari Kurnia Selatan	Kecamatan Sungai Rumbai	Bersertifikat	Hak Pakai No. 10
13	Fasilitas Umum Nagari Sipangkur	Luas 1608 m2	Nagari Sipangkur	Kecamatan Tiumang	Bersertifikat	Hak Pakai No. 03
14	Fasilitas Umum Piruko Selatan	Luas 10067 m2	Nagari Sitiung	Kecamatan Sitiung	Bersertifikat	Hak Pakai No. 33
15	Fasilitas Umum Piruko Selatan II	Luas 2580 m2	Nagari Sitiung	Kecamatan Sitiung	Bersertifikat	Hak Pakai No. 40
16	Fasum Bukit Tujuh Ranah Palabi	Luas 33040 m2	Nagari Ranah Palabi	Kecamatan Timpeh	Bersertifikat	Hak Pakai No. 21

Figure 2. Atribute table

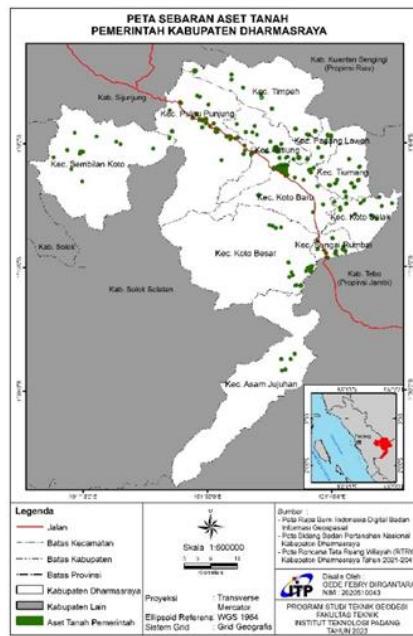


Figure 3. Land asset distribution map

2.3. WebGIS Design

The design of WebGIS is carried out through several steps, which are:

The first step is to create a local WebGIS using mapping software such as QGIS. This local WebGIS is created by installing the qgis2web plugin, and the data is still stored on the programmer's computer.

Once the local WebGIS is ready, the data is uploaded to GitHub, which is a website and cloud service that helps users store, manage, and develop their IT projects. To upload WebGIS data, you first need to create an account and a Repository (folder). The maximum free storage limit on GitHub is 100 GB.

After the WebGIS data has been uploaded to GitHub, it is then connected to the Netlify provider to create a hosting name under a single account, making it possible to publish the WebGIS publicly. Here are the results of the WebGIS map using the Netlify provider.

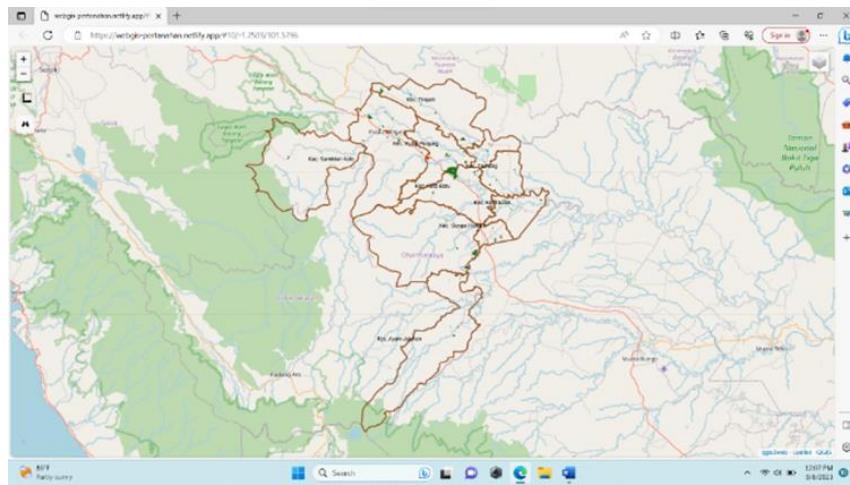


Figure 4. WebGIS interface

3. Results and discussion

3.1. Mapping of land asset owned by the Dharmasraya Regency

In this research, the total number of land assets is 246 parcels, and when examining their distribution, it is evident that the number of land assets in each district of Dharmasraya Regency is not uniform. The results of the distribution of land assets owned by the Dharmasraya Regency Government can be seen in Table 1.

Table 1. Distribution of land asset

No	District	Area	The Number of Asset
1	Asam Jujuhan	5	42,347
2	IX Koto	14	57,278
3	Koto Baru	21	2,899,300
4	Koto Besar	24	236,912
5	Koto Salak	18	78,369
6	Padang Laweh	12	96,563
7	Pulau Punjung	41	417,458
8	Sitiung	59	316,034
9	Sungai Rumbai	18	179,602
10	Timpeh	17	183,976
11	Tiumang	17	100,646
Total		246	4,608,485

3.2. Visualization of land asset in Dharmasraya Regency using WebGIS

The visualization using WebGIS aims to facilitate the local government in monitoring the development and distribution of assets in the region. The WebGIS map that has been successfully created using the Netlify provider is then integrated with the website of Perkimtan Department of Dharmasraya Regency. On the WebGIS page, users can access identification information contained in each land asset, which will appear when users hover their cursor over one of the land objects.

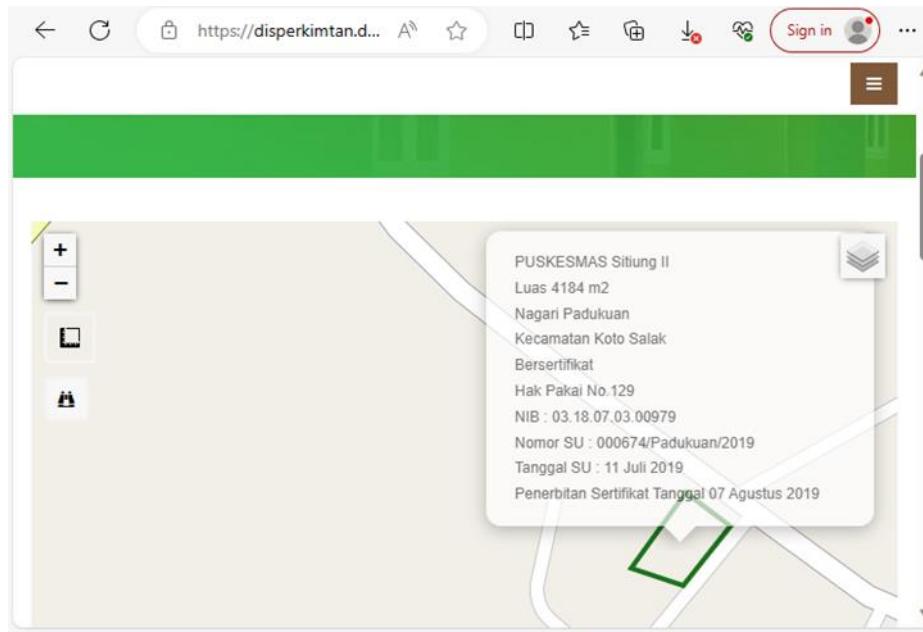


Figure 4. Identify object

4. Conclusions

Based on the results of the Final Project research on the management of government land assets in Dharmasraya Regency, the distribution of land assets owned by the Dharmasraya Regency Government across 11 districts

reveals that out of the total of 246 assets, the highest number of assets is in the Sitiung District, totalling 59 assets, while the lowest number is scattered in the Asam Jujuhan District, with only 5 assets. In terms of total area, the land assets scattered throughout Dharmasraya Regency cover a total area of 4,608,485 square meters (460.85 hectares). The largest land asset owned by the Dharmasraya Regency Government is situated in the Koto Baru District, with an area of 2,899,300 square meters (289.93 hectares), while the smallest land asset owned by the Regional Government of Dharmasraya Regency is in the Asam Jujuhan District, with an area of 42,347 square meters (4.23 hectares). The visualization of land assets owned by the Dharmasraya Regency Government using WebGIS can be accessed on the website of Dinas Perumahan Kawasan Permukiman dan Pertanahan of Dharmasraya Regency at the website address: <https://disperkimtan.dharmasrayakab.go.id>.

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