

Dissemination of digital map technology for administrative map in Padukuhan Soka, Kandirejo Village

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ABSTRACT

Padukuhan Soka is one of the hamlets that are in the administrative area of Candirejo Village. So that information is needed in the form of administrative maps and public facilities that can be used as a support for the Soka Padukuhan in managing their households. The purpose of this community service is to map the Soka Padukuhan as a basis for regional development in the Soka Padukuhan area, Candirejo Village, Semanu District, Gunungkidul Regency. The methods used include surveys, preparation stages, map making processes, temporary print outs, permanent print outs, and map handover. Community service activities at Padukuhan Soka produce village maps containing geospatial information that can be found in the area. This information is in the form of administrative area boundaries shown on the village map. Therefore, the presentation of the map needs to be updated over time to adjust to the latest conditions in Padukuhan Soka. In development planning, the map is used as material in managing the Soka Padukuhan area so that it makes it easier to find out the administrative areas in the Soka Padukuhan.

KEYWORDS

Soka hamlet;
Map;
Borderline;
Administrative



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1. Introduction

Remembering that community service is a manifestation of academics who are present in the community which involves academics such as students, lecturers, alumni, and other education staff. Apart from that, it is also the embodiment of the Tri Dharma of Higher Education, namely service which in its implementation cannot be separated from the other two dharma. Making administrative maps of Padukuhan Soka is one of the efforts to implement an integral part of the Tri Dharma of Higher Education, namely community service by voluntarily donating maps to Padukuhan Soka. Based on the regulation of the Minister of Home Affairs of the Republic of Indonesia Number 45 of 2016 concerning Guidelines and Confirmation of Soka Padukuhan Boundaries, it is necessary to have an administrative map of Soka Padukuhan to fulfill this as a supporting instrument.

Padukuhan Soka is located in Candirejo Village, Semanu District, Gunungkidul Regency, Special Region of Yogyakarta. Padukuhan Soka has 1 community unit (RW), namely RW 13 and 4 neighborhood units (RT), namely RT 01 - 04. The northern boundary is bordered by vacant land and fields; to the south it is bordered by fields; to the east it is bordered by Padukuhan Colokidul and to the west it is bordered by Padukuhan Gebang. The distance from Padukuhan Soka to the urban village is 1.1 km; the distance from Padukuhan Soka to the sub-district town is 10 km; the distance from Padukuhan Soka to the regency city is 14 km; The distance from Padukuhan Soka to the provincial city is 57 km. The entire area is accessible to electricity, PAM water, and has a telecommunication network.

The map is a picture of the earth's surface displayed in a flat plane. The appearance contained in the map can be used as a source of information by the government as policy makers and planning experts to make decisions in the development process. Maps made in the latest or updated year using the latest

data will of course produce factual and up-to-date data or information so that local government policies are assessed as having integrity.

Administrative maps are technical data that are needed in a hamlet to determine the location and boundaries of an area. The administrative map also contains gampong facilities such as roads, drainage, and others. In general, the map contains a general description of the earth's surface on a flat plane with a certain scale and is equipped with a legend, while the legend contains symbols containing information. Maps are used as a means of conveying information about a condition in the location of an area and the environment around the area, making it easier to get information about an area. The village map consists of information such as the area of the hamlet area, the boundaries of the hamlet area, the hamlet roads and other important information.

Padukuhan Soka is located in the highlands with a typology of padukuhan, namely the settlement is one of several hamlets in Candirejo Village, Semanu District, Gunungkidul Regency which is divided into 4 RTs and 1 RW. The problem faced by the Padukuhan Soka is the lack of geographic information regarding the Administrative Map of the Padukuhan Soka area. The Administrative Map in Padukuhan Soka is a map made in the 90s so the map is incomplete because it no longer matches the existing conditions in Padukuhan Soka. Because the Padukuhan Soka do not yet have the latest Administrative Maps in hardfile or softfile form with complete map information, it is deemed necessary to make a padukuhan administrative map.

Digital maps have been extensively researched by previous researchers as a reference for this community service. Do footbridges and underpasses improve pedestrian safety? The Hong Kong case study using a three-dimensional digital map of the pedestrian network was investigated by Zhu [1]. Mapping Ancient Athens: A Digital Map to Save Excavations researched by Theocharaki [2]. Incorporate GIS digital maps in FLE classes: theory and practice researched by Hellmich [3].

A strictly deterministic global optimization approach for the derivation of secondary information in digital maps was investigated by Eder [4]. IMPROVING RAILWAY DIGITAL MAP FOR SLAM: FEASIBILITY STUDY researched by CHOUGHANI [5]. The Gaussian posterior approximation for digital map-based localization using a particle filter was investigated by Przewodowski [6].

Digital mapping tools: territorial approaches to containment of Fusarium wilt TR4 in Peru investigated by Clercx [7]. The development of a smartphone-based indoor navigation system using BLE nodes for workers in industry 4.0 through a digital map interface was researched by Jose [8]. Towards biogeographical regionalization of the Nearctic region: Area nomenclature and digital maps researched by ESCALANTE [9].

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Digital mapping as a feminist method: critical reflection researched by Fileborn [13]. A three-dimensional low-altitude flight path planning technology based on digital maps was researched by Zerui [14]. Virtual visits: Reminiscences in nursing homes with digital mapping technology investigated by Webber [15].

GIS-based digital mapping and spatial analysis of the Pur-Banera Group in Rajasthan, India, with particular reference to the structural control of base metal mineralization investigated by Ghosh [16]. Digital Map of Atmospheric Refractivity and Atmospheric Channels Based on Meteorological Observation Datasets investigated by Hao [17]. Padmasari [18] examined the usefulness of digital map applications using hand gesture recognition as a history learning medium for elementary schools [18].

Digital Map Simulation and Paleo Stress Analysis of Post-Accretionary Structures in the Southeastern Desert (Egypt): A Case Study of the Wadi Kharit Shear Zone investigated by Younis [19]. Digital mapping of the enrichment of potentially toxic elements in the soil of Lake Urmia due to lowering of the water level was investigated by Alyyar [20]. Reconstruction of lane-level routable digital maps for road networks using low-precision GPS data was investigated by Arman [21].

Digital maps and probability compensation models for repeated positioning errors of the feed axes were investigated by Wu [22]. The Estimation Method for PV Power Plants Along the Highway Based on Digital Maps was researched by Ma [23]. Digital Maps of Accessibility Everywhere through Smartphone-Based Crowdsourcing researched by Aly [24].

Creating a digital map of soil geotechnical characteristics based on GIS technology and remote sensing was researched by El-Banna [25]. In the Design of High Accuracy Sensor Fusion-Based Digital Rail Maps studied by Baldoni [26]. Automatic change detection of digital maps using aerial images and point clouds was investigated by Dahle [27].

Determining the water footprint of sunflowers in Turkey and creating digital maps for sustainable agricultural water management was researched by Bulut [28]. Digital Mapping of Soil Profile Properties for Precision Agriculture in Developing Countries was researched by López-Castañeda [29]. Research on digital mapping methods for maneuvering tracked equipment on soft ground was researched by Mingming [30].

With this background, Muhammadiyah University Group 072 Real Work Lecture (KKN) students took the initiative to help the Soka Padukuhan by making an Administration Map so that village officials and the community could know the boundaries of the padukuhan area, identify the potential of the padukuhan as the first step in planning the development of the potential of the Soka Padukuhan.

The purpose of this community service activity is village mapping as a basis for regional development in the Padukuhan Soka area. Increasing the welfare of Padukuhan Soka needs support from various parties, one of which is higher education institutions. Therefore, this community service is a form of our support in improving the welfare of Soka Elementary School by optimally utilizing geospatial information.

2. Method

Community service activities in the form of making village maps were carried out in Padukuhan Soka, Candirejo Village, Semanu District, Gunungkidul Regency. This activity consists of several stages, namely a preliminary survey in the form of an application for permits from Dukuh Padukuhan Soka, RW (Rukun Warga), and RT (Rukun Tetangga) and provides an explanation regarding the purpose of the activity and the benefits that can be obtained. In addition, an explanation regarding the flow of activities was also conveyed so that the parties fully understood the flow of implementation of activities from start to finish. Next is the primary data collection stage in the form of a survey of public facilities in Padukuhan Soka as well as secondary data from Soka Padukuhan documents in the process of making a map in Padukuhan Soka. Then the process of making this map was then printed out temporarily to consult the state of the Soka Padukuhan equipment. If you can print out the map directly with a scale of 1:1000 which has been consulted with a size of 1500 x 1000 and framing/finishing is carried out. The last stage is the procession of handing over the administrative map to Dukuh Padukuhan Soka.

Materials and tools that support the implementation of activities at Padukuhan Soka are Lansat TM images that have been georeferenced with geometry correction techniques, ArcGIS and Autocad software, laptops/computers, and printing equipment. The following is an explanation regarding the stages of community service at Padukuhan Soka:

1. Preliminary survey by visiting the dukuh residence to explain the aims and objectives of the activity to the dukuh officials, explain the flow of the activity implementation, and describe the benefits that can be obtained from the activity of procuring the administrative map.
2. The preparation stage by collecting supporting data in the process of making administrative maps. The data is in the form of area boundaries according to archival data at Padukuhan Soka, the latest georeferenced 2022 image data, coordinates of public facilities located at the location.
3. The process of making the map is by first digitizing it to make area boundaries that are in accordance with the dukuh data archive. After that, input data for the coordinates of public facilities and other public features, such as roads, were obtained from secondary data. The final step in the manufacturing process is the temporary layout and printout.

4. The results of the temporary printout are consulted in advance with the Soka community unit whether they are appropriate or need to add other information.
5. Next is a printout of the administrative map that has been consulted with a size of 1500 x 1000 cm and framing/finishing is done
6. Handing over administrative maps to the padukuhan apparatus which was carried out at the Soka Padukuhan Hall and witnessed by representatives from the Soka padukuhan community.

Participation of the parties in the implementation of this activity is assisting in collecting supporting data for making maps, preparing map handover agendas, and providing socialization of the use of the Padukuhan Soka administrative map to the community so that understanding regarding the benefits of village maps is not only for the consumption of padukuhan tools but also for the community in general which can be accessed free of charge.

3. Results and Discussion

This community service activity was carried out on Monday, August 15 2022 at the Soka Padukuhan, Candirejo Village, Semanu District, Gunungkidul Regency. This activity consists of a series of events. Community service activities at Padukuhan Soka produce administrative maps containing geospatial information that can be found in the area. The information is in the form of administrative area boundaries, facilities and infrastructure. The fundamental contribution of this activity is to increase the capacity of the local community and government in planning, implementing and evaluating development planning efforts that will be carried out in the future according to the needs and conditions of the local community by looking at the maps that have been made. Apart from that there is a legal report as proof of scientific documents with this community service in the form of a community service report at Soka Padukuhan.



Fig. 1. Map of Padukuhan Soka

The village map was created using GIS software, namely ArcGIS, SAS Planet and Autocad. The SAS Planet page is used to obtain high-resolution image data that has been georeferenced with a geometry correction technique so that the appearance of the recorded objects can be seen clearly. ArcGIS is used for data processing starting from image cropping, adding attributes, and layouts. The presentation of the village map has been adjusted to the Regulation of the Head of the Geospatial Information Agency concerning Technical Specifications for Village Map Presentation. Find out what potential information

exists in a village or sub-district and for regional development needs with more specific data, namely by making a village potential map

The map in Padukuhan Soka previously did not meet the standards for writing maps other than that it only presented information that had not been updated as shown in Figure 1. The figure shows that the map needs to be updated by improving the quality of the village maps in Padukuhan Soka so that it can be utilized by village rankings by optimizing the presentation of good geospatial information. Therefore, it is hoped that this map will be able to improve the quality of the hamlet maps in Soka Padukuhan so that they can be utilized and useful for village officials for various things. Figure 1 below is a map of the Soka hamlet presented at a scale of 1:1000.

The map shown in the figure provides an overview of the position of residents' houses and road access in the Soka hamlet in August 2022. Changes in land use can occur for certain reasons. Therefore, the map presentation needs to be updated over time to adjust to the latest conditions of the appearance of the earth's surface in Padukuhan Soka, so that the map presentation will be more accurate and its utilization will be more optimal.

In terms of development planning, the map can be used as material area analysis by taking into account the existing land cover in the planning area. Besides in addition, the level of settlement density can also be used as analysis material for planning development in the form of public facilities that can be utilized by the community. The Soka Padukuhan area is dominated by residents' land. There are lots of green open spaces which are available. Transfer of land for green open space can also be planned with make use of the map.



Fig. 2. The process of making a frame

The documentation in Figure 2 is a finishing process by making a frame for the map and the process of handing over map grants in community service which is carried out at the Soka Hamlet Hall. The hamlet is very grateful for the map grant so they are willing to establish partner relationships in the future in the context of other academic interests. The hope is that the map can be used as well as possible and used properly.

4. Conclusion

The village map displays geospatial information that can be used as material for government analysis in making a policy. The administrative map of Padukuhan Soka provides information regarding the

surface features of the area, such as residential land cover, vacant land, and public facilities. This information can be used for development planning materials in Padukuhan Soka, Candirejo Village, Semanu District, Gunungkidul Regency. From this service activity it is hoped that it will not stop here, meaning that there is a continuation of this activity, namely in the form of monitoring and evaluation of activities in utilizing the maps that have been made and can be useful for the local Padukuhan apparatus and the Soka Padukuhan community.

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Author Contribution

The activity plan in order to implement digital maps for administrative map in padukuhan soka kelurahan candirejo

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Conflict of Interest

The authors declare no conflict of interest.

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