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Geospatial Intelligence For The Selection Of Locations For The New Indonesian Presidential Palace

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Abstract Geospatial Intelligence (GEOINT) has expanded to various fields of life. By combining with the science of geography to produce defense geography. This study aims to see the ability of GEOINT in assisting the selection of the location of the presidential palace, which is planned to be moved from Jakarta to East Kalimantan. Using photogrammetric data can produce an overview of the planned location of the capital as a basis for competent respondents to make choices. Of the eight respondents, all of whom live or work around the planned location of the capital city, they got the best alternative based on GEOINT data. Respondents chose alternative 1 because it had the highest score from the aspect of physical geography and socio-cultural geography. From the interviews, most of the respondents wanted a location that was safe from flooding and far from residential areas and there was no relocation of residents. The conclusion is that GEOINT can summarize the condition of the planned location of the new state capital from a physical and socio-cultural perspective. GEOINT is not only useful for military purposes but also for non-military interests.

Keywords: geospatial, intelligent, capital

Abstrak Intelijen Geospasial (GEOINT) telah berkembang luas ke berbagai lini kehidupan. Dengan menggabungkan dengan keilmuan geografi menghasilkan geografi pertahanan. Penelitian ini bermaksud mellihat kemampuan GEOINT dalam membantu pemilihan lokasi istana Presiden yang rencananya dipindahkan dari Jakarta Ke Kalimantan Timur. Menggunakan data hasil fotogrametri dapat menghasilkan gambaran lokasi rencana ibukota sebagai dasar para responden yang berkompeten untuk melakukan pemilihan. Dari delapan responden yang kesemuanya berdomisili atau bekerja di sekitar rencana lokasi ibukota diperoleh alternatif terbaik berdasarkan data GEOINT. Responden memilih alternatif 1 karena paling tinggi nilainya dari aspek geografi fisik dan geografi sosial-budaya. Dari hasil wawancara sebagian besar responden menginginkan lokasi yang aman dari banjir serta jauh dari permukiman warga serta tidak ada relokasi penduduk. Kesimpulannya bahwa GEOINT mampu memberikan gambaran terkait kondisi rencana lokasi ibukota negara yang baru dari segi fisik mapun sosial-budaya. GEOINT bukan hanya berguna bagi kepentingan militer namun juga bagi kepentigan non-militer.

Kata kunci : geospasial, intelijen, ibukota

1. Introduction

Moving the capital city of Indonesia to East Kalimantan still raises the question of where is the presidential palace located? The Presidential Palace is very important for a country as a symbol of the existence of a nation. Even the President of Kazakhstan, Nazarbayev, declared his country's new capital, Astana, the Heart of Eurasia. (Koch, 2010). According to Yacher (2011) that theoretically, handing over the design of a capital city to a foreign entity signifies the country's ultimate potential. A nation's capital reflects the country's economic, political and social strengths, and an international worldview. Indonesia has been planning to move its capital for a long time. From the colonial era to the government of President Joko Widodo. Picture 1. Like other countries that wish not to use a capital, that is a legacy of colonialism, such as Malaysia, which refuses to use a former colonial capital and replace it with a city that symbolizes the national ideology and aspirations of the state. (Moser, 2010). Several countries also described in Schatz (2003) moved their post-colonial capitals such as Mauritania, Pakistan, Libya, Nigeria and Kazakhstan.

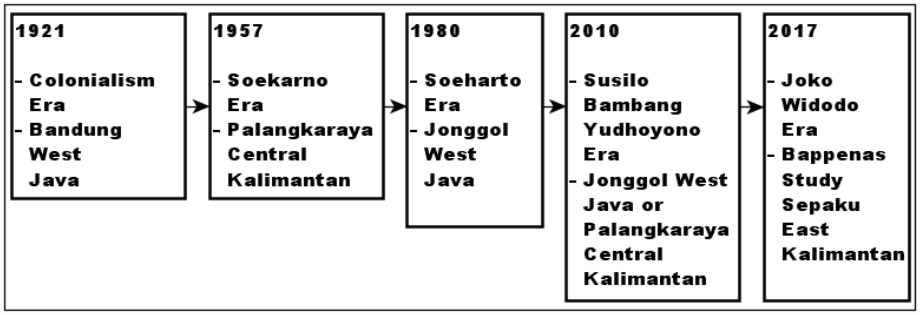

Figure 1. A historical summary of the discourse on moving the capital of the State.

Source : Ministry of Finance of the Republic of Indonesia (2019)

In the era of President Joko Widodo, the design of the capital city of Indonesia began in 2019 with a design competition held and in 2020 it held another building design competition. There has been a difference in location between the results of the contest design winners and the building design winners. In the image posted on social media youtube, we can see that the topography around the palace plan is different in the two competitions. The location of the winner of the competition depicts a palace surrounded by a lake, while roads and trees surrounded the location of the winner of the design of the building. Figure 2.

Figure 2. Two different presidential palace design plans.

The difference between these two designs is natural because planning a national capital is not the same as planning an ordinary city. Planning a new capital city requires a full combination of the country's urban design techniques and political, economic, and academic knowledge, and the physical planning of a new capital involves not only solutions to the country's urban spatial needs, but also its national vision and philosophy. That is, capital cities have important implications for urban design. (Kwon, 2015). Countries such as Astana and Brazil build their presidential palaces with elevations above 50 mean sea level (msl). Meanwhile, Malaysia built its presidential palace with the average building being above 30 msl. (Morris et al., 2016). Figure 3.

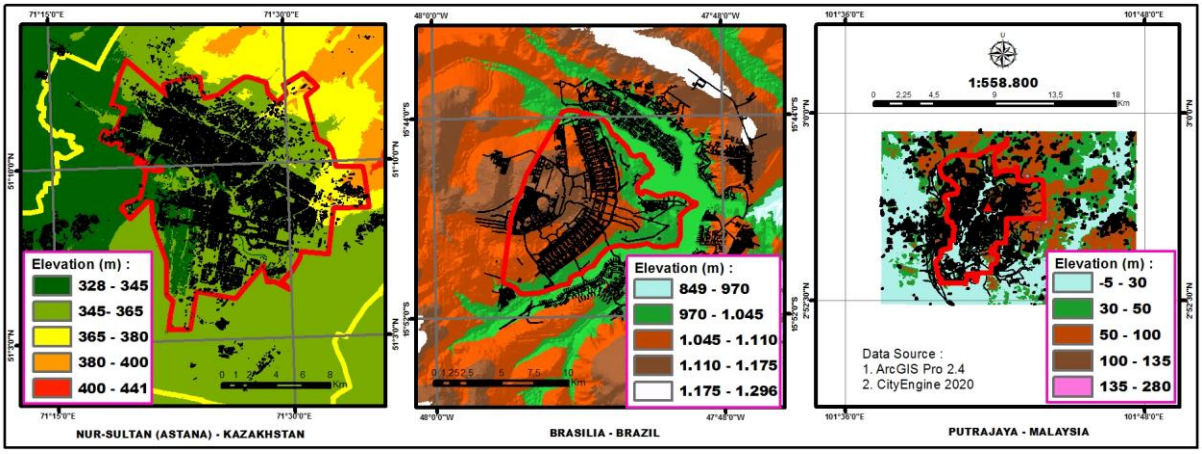

Figure 3. Comparison of the capitals of Kazakhstan, Brazil and Malaysia

During the administration of the second President Joko Widodo (2019-2024), Indonesia was built in the periphery by strengthening villages within the framework of a unitary state (Neilson & Wright, 2017), rural development (Hill & Negara, 2019). The capital of the country is the embodiment of a strong state economy. (Williams & Selle, 2016). The development of the national capital must combine all elements of geography, including in terms of defense and security. In Supriyatno (2018), Rajab & Supriyanto (2019), regarding the analysis of the relocation of the state capital, it is stated that the elements of physical and socio-cultural geography that are considered in the selection of an area to become the state capital, namely from physical geography consist of: spatial relationship, topography and drainage, geology and soil, vegetation, in land water, oceans and seashore, weather and climate, daylight and darkness, and gravity and magnetism. meanwhile, the socio-cultural geography consists of: population pattern, social structures, logistics supply, industries and land use, transportation network, telecommunications, and military installation. We can describe both factors in table 1.

Table 1. Geographic Factors

Physical Factors	Cultural Factors
Spatial Relationships	Racial and Ethnic Roots
Topography and Drainage	Population Patterns
Geology and Soils	Social Structures
Vegetation	Languages and Religions
Oceans and Seashores	Industries and Land Use

Weather and Climate	Transportation Networks
Daylight and Darkness	Telecommunications

Source : Collins (1998)

The rapidly changing strategic environment will always go hand in hand with the wider threat that has a negative impact on national defense. The extent of threats can be divided into military threats, non-military threats and hybrid threats which are divided into two, namely real and unreal threats. (Kementerian Pertahanan Republik Indonesia, 2015). The higher the threat level, the higher the challenges for the intelligence world. Intelligence is about reducing uncertainty in conflict. The typical goal of intelligence is to establish facts and then develop appropriate, reliable, and valid conclusions (hypotheses, estimates, conclusions, or predictions) for strategic decision-making or operational planning. (Clark, 2013). The intelligence challenge level is shown in table 2.

Table 2. Levels of Intelligence Challenges

Level	Parameter
Level 1	Subterranean
Level 2	Topography—roads, chokepoints, etc..
Level 3	The Cityscape—the buildings
Level 4	The Service Infrastructure
Level 5	The People—human terrain
Level 6	The Networks—social or criminal capital
Level 7	The Flows—people and things
Level 8	Forms and Spaces of Governance
Level 9	The Rhythm of the City
Level 10	The Cyber and Electronic Layer

Source : Williams & Selle (2016)

Remote Sensing, GIS, GPS and AHP strategy is an essential instrument for Identification, examination and multi-standard dynamic investigation of metropolitan improvement site's appropriate arranging and the board. (Parry et al., 2018). Geospatial Intelligent (GEOINT) is a technology that can combine the four instruments. GEOINT is a combination of imagery, imagery intelligent and geospatial information. GEOINT utilizes the abuse and investigation of symbolism and geospatial information to portray, evaluate, and imagine actual highlights and topographically referred to exercises, whether or not it is utilized for military of compassionate purposes. (Clarke, 2020). Military geography, for us, is about attempts to capture the range of social practices through which armed conflict comes into being, and all the things which surround, support, and sustain the pursuit of war. (Rech et al., 2015).
Drone technology is still relatively new to use in Indonesia. From several previous studies, no one has discussed finding the presidential palace using drone technology. Drone technology is a cheap technology compared to using airplanes (Tang & Shao, 2015) (Ancin-Murguzur et al., 2020) and produce large-scale maps. (Leksono et al., 2019). In this study, it will combine the data obtained from the acquisition by airplanes and data acquisition by drones.
From the description of the conditions above, I built this research with the following objectives: (1) Describe the condition of the planned location of the new Presidential palace; (2) Knowing the

residents' choices regarding the location of the planned presidential palace; and (3) Seeing the residents' perceptions regarding their regional plan to be the location of the presidential palace;

2. The Methods

The research area, which is within the Penajam Paser Utara Regency, precisely in Bumi Harapan Village, Sepaku District, is located at 104° 18'–105° 12' East Longitude and 05° 05'–05° 56' South Latitude in East Kalimantan (Borneo Island). Figure 4. The expected translocation of the city requires immediate research efforts to document the current biotic and abiotic conditions of the area receiving the new capital, to better understand the effects of anthropogenic perturbation in the biological and physical properties of Borneo.

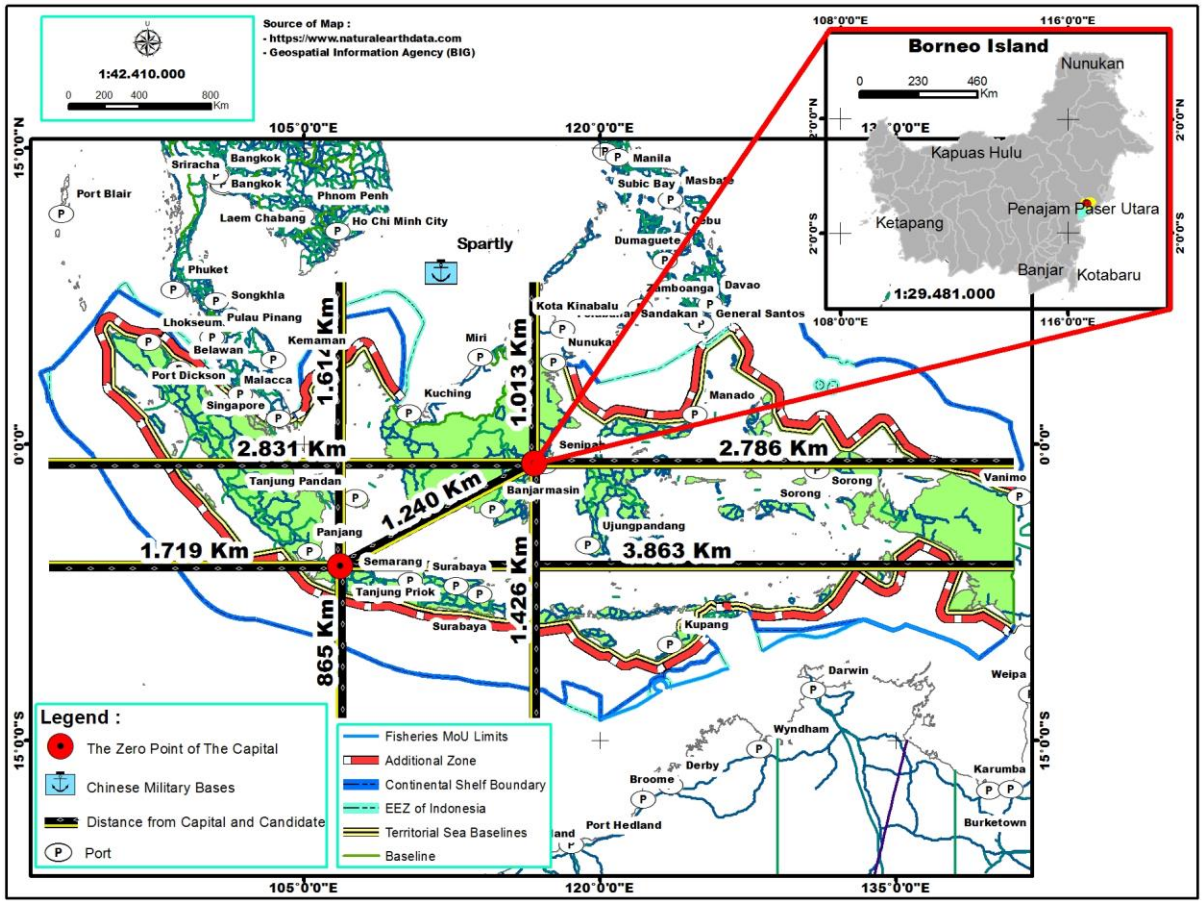

Figure 4. The position of the palace and the plan of the presidential palace

This type of research uses mixed methods research with embedded design research, where quantitative research is the primary basis of research. In this study design, one of the data collection methods dominates and the other one is embedded in it with all data collected at the same time. (Creswell & Clark, 2017). In quantitative research, it describes the topographical conditions of the planned location of the capital and gets choices from respondents. Meanwhile, quantitative research is carried out simultaneously by asking the respondents unstructured questions.

This study examines the opinions of eight competent respondents regarding the control of the area where the planned state capital is located. It took eight people as respondents, namely 1 Paser traditional leader, 1 Javanese traditional leader, 1 religious leader, 1 Bumi Harapan village head, 1 Employees of Itci Hutani Manunggal Limited Liability Company (in Indonesian is PT. IHM), 1 sub-

district officer, 1 police officer, and 1 military officer. All respondents are domiciled or work in the Sepaku District, which is the planned location for the state capital.

The instruments used comprise : (1) survey and mapping equipment, GPS Geodetic type with the Galaxy G6 brand, Drone Quadcopters with the Phantom DJI 4 brand and GPS Navigation type with the Garmin Montana 650 brand. We can even combine this type of Geodetic GPS with CORS for underwater measurements with an accuracy of 0.12 m. (Song et al., 2020). Multirotor drones such as quadcopters have distinct advantages compared to other systems. Other UAVs, such as durability, high maneuverability, and low buy and maintenance costs. Multirotor drones have been used for non-military purposes. (Harvey et al., 2016). (Irizarry dan Costa 2016). The results of orthomosaic drone photos are able to describe the topography well. (Wahyudi et al., 2020). Figure 5.

Figure 5. Instruments used for mapping in research
Source : Field survey in December 2020

Questionnaires are used to find out the opinion of competent respondents regarding the geographical conditions of the planned capital city location. The function of the questionnaire describes the physical geographical and socio-cultural conditions of the location of the planned capital city. This main instrument is supported by other instruments that are useful for clarifying the questionnaire. And will be clarified through interviews with respondents. The AHP is a technique that can be utilized to set up measures in both the physical and social areas. (Saaty & Vargas, 2012). Figure 6.

The research was conducted for three months with preparations in the form of searching for information on the approximate location of the presidential palace. Information was got through competition data from the Ministry of Public Works and Public Housing, through webinars and online media in the form of news and photos. We can know all information through the GEOINT technique by entering the location coordinates and matching the image to the initial location. We then brought the data to the field for further description and additional locations. Then the location that has been got is mapped using a mapping instrument. It generated the mapping results from processing using geospatial applications into various thematic maps that will help respondents to determine the choice of the location of the Presidential palace. Then the data from the respondent's choice is processed using the Expert Choice application so that the selected alternative is got.

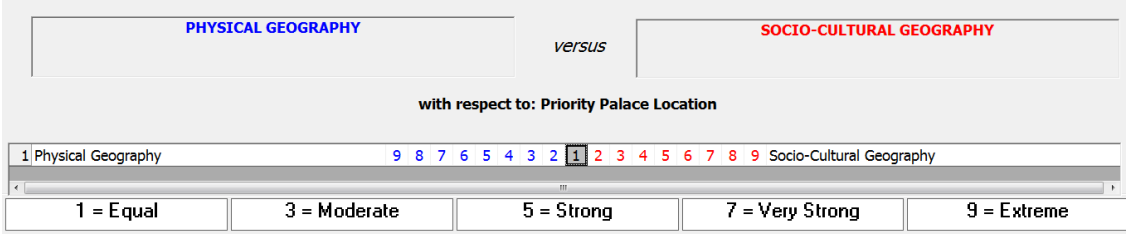

Figure 6. Compare the relative importance in AHP

3. Result and Discussion

The gap in the state's distance palace to the western and eastern hemispheres of Indonesia makes Indonesia west-centric. Comparison of the distance between the capital city of Jakarta to the western tip of the island of Sumatra to the tip of the island of Papua is 1,719 km: 2,786 km. Figure 4. The transfer of the presidential palace from Jakarta to the village of Bumi Harapan, Sepaku District, North Penajam Paser Regency, East Kalimantan Province as far as 1,240 Kilometers. The capital in Sepaku should follow the pattern set by Malaysia in Putrajaya. Putrajaya is the planned administrative capital of Malaysia, which was built to accommodate the growing ministry of the federal government. (Morris et al., 2016). Indonesia does not have to follow the pattern of moving its capital city like Kazakhstan and Brazil. Figure 3. The relocation of the two countries is not suitable for Indonesia, which has many large islands. Indonesia can still move residents on the island of Java to other islands besides Kalimantan, such as the island of Papua.

The formation of a new capital city in Kalimantan can be a big biodiversity disaster if there are no biotic and abiotic conditions for the location of the planned new capital city. (Van de Vuurst & Escobar, 2020). By using GEOINT able to describe the biotic and abiotic conditions of the location of the capital plan. From the results of surveys and mapping using GPS Geodetic, drones, and GPS Navigation as well as geospatial data from Geospatial Information Agency (in Indonesian is Badan Informasi Geospasial / BIG) and PT. IHM produced high-resolution orthomosaic images as material for making topographic maps and thematic maps. Figure 7. Thematic maps produced include land use maps, geological maps, elevation maps, and slope maps. Figure 8.

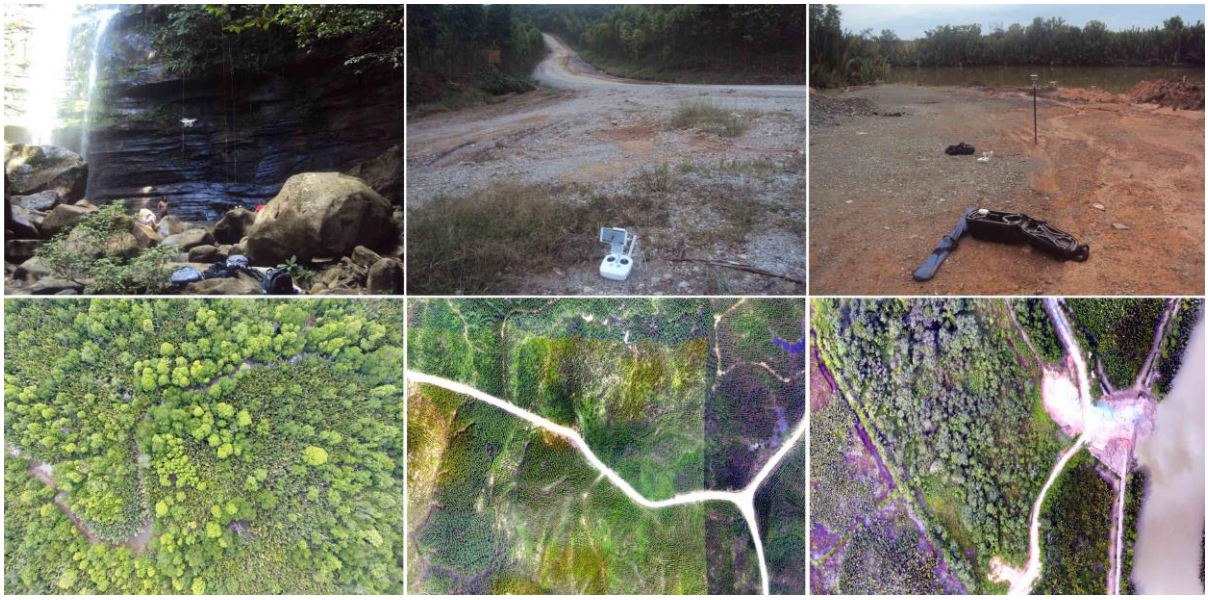

Figure 7. Survey and mapping of the planned location of the Presidential palace
Source : Field survey in December 2020

Taking the opinion of Clark (2013), GEOINT can combine aerial photos, geospatial information (maps, photos), and location information from various sources to describe, assess, and visually describe the physical features and activities around the location of the presidential candidate's palace. As shown in Figure 9. From various intelligence information, they can find three alternative locations of the Presidential Palace. These three alternatives will be the choice of competent respondents for conditions in Sepaku District.

Based on various maps produced, the eight respondents could choose candidates for the presidential palace based on physical geography and socio-cultural factors. Figure 10 shows each of the criteria and alternatives as a treeview of the Expert Choice application. In determining the hierarchical weighting factor and the evaluation factor, it must carry a consistency test out (CR < 0.100). (Saaty & Vargas, 2012). Figure 11.

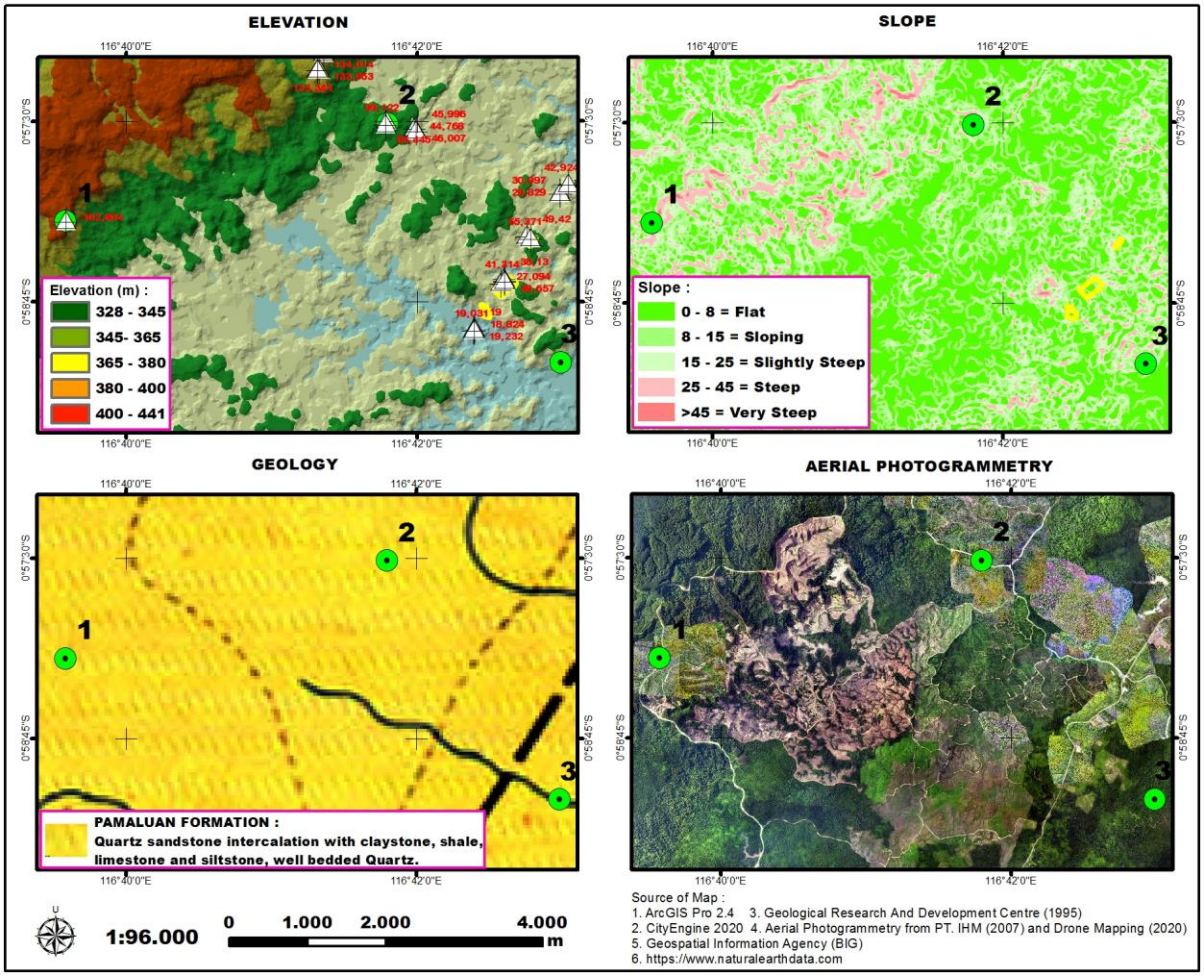

Figure 8. Thematic map of the results of processing intelligence geospatial data

Figure 9. Alternative for the location of the Presidential palace
Source : Field survey in December 2020

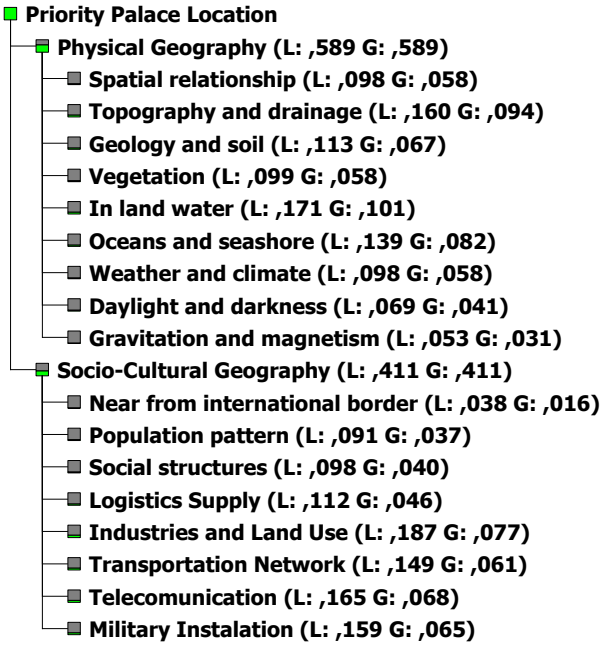

Figure 10. Tree view in AHP

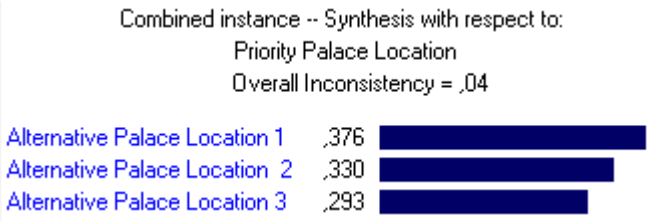

Figure 11. Results of respondents' choices for the location plan of the Presidential palace

Besides filling out the questionnaire, I also asked the respondents some unstructured questions. The key question asked is why choosing one alternative, especially the top choice, is alternative 1. The answers given are: (1) alternative 1 is far from settlements; (2) alternative 1 is on land controlled by the government; (3) alternative 1 has a higher elevation because the Sepaku sub-district has experienced flooding; (4) alternative 1 is not directly connected to the Sepaku river which is the original habitat of freshwater crocodiles; (5) the villagers of Bumi Harapan experience anxiety when there will be population relocation; (6) residents do not want them to be left out by the arrival of immigrants such as the Betawi tribe who were evicted in Jakarta; (7) According to the village head, most of the residents are farmers, so they are still afraid of losing their jobs because their territory is the state capital. However, overall, none of the respondents refused to have their territory become the state capital, as long as there was no eviction.

4. Conclusion

Geospatial intelligence data has made it easier for respondents to make choices regarding alternative candidates for the location of the new Presidential palace. By using survey and mapping tools combined with field information, it generated accurate and thorough intelligence. The change in the design's location of the presidential palace shows that the data on physical geography and socio-cultural geography of the designer is incomplete.

Alternative 1 has been chosen as the location for the presidential palace where the location is not the second location. The results of the competition show that respondents who are more familiar with the area of the candidate for capital have different opinions. According to them, other locations have weaknesses because of the relatively low elevation and too close to community settlements.
It is hoped that the results of this study can provide input to the Government, especially the institution in charge of planning the location of the Presidential palace. The main input is that geospatial intelligence is one of the concepts in integrating physical and socio-cultural elements into useful data in making decisions regarding the location of candidates for the presidential palace or other capitals.

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