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# Use of GIS to Discover the Existence of Terrorism

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**ABSTRACT**

**Threats to national defense can be military or non-military. The greatest unresolved threat and challenge facing the Indonesian state is terrorism. The Indonesian government has dealt with terrorism, but catching terrorists remains difficult. The purpose of this research is to provide an alternative that uses Geospatial Intelligence (GEOINT) to find out where terrorists are hiding. The limitation of this research is the mountainous region in Central Sulawesi Province. The method used in this study is to use the GEOINT approach which is a combination of remote sensing, geographic information systems (GIS) and cartography, to extract information and analyze the results. The analysis was performed using a weighted linear combination method. The quantification process is carried out on all spatial data used for each parameter related to the presence of terrorists in the mountains. Quantification is done by changing each sub-parameter class to a value between 1-5. Each value is then weighted as a coefficient to arrive at the final score. From the results of the analysis and discussion it can be concluded that the GEOINT analysis can be used as an initial research on terrorist hideouts.**

***Keywords—*** GEOINT, Terrorism, Weighted Linear Combination, Poso

## I. INTRODUCTION

National defense is all forms of efforts to maintain the entire nation's sovereignty, integrity, and safety from threats and disturbances. The Indonesian defense system is universal which involves all citizens, territories, and other national resources. Hence it is prepared early and implemented in a total, integrated, directed, and continuous manner by the government to uphold state sovereignty, territorial integrity, and the safety of the entire nation from all threats. The management of national defense includes all activities at the strategic and policy levels, including planning, implementation, supervision, and national defense control. In its implementation, the national defense must be supported by the components in UU No.3/ 2002, such as principals, reservists, and supporting components.

Human security has been defined in several perspectives, such as Japan, Canada, and the United Nations Development Program (UNDP). Thus, human security can be guaranteed when humans are free from fear. The government and authorities can pay attention to several priorities such as promoting peace, preventing conflict, and public safety [1]. However, the biggest threat and challenge for the world that has not yet been resolved is terrorism. Terrorism is a crime that uses violence to create fear and hurts political, economic, and social aspects [2].

In addition, the actions of a group of terror appeared in Poso Regency, Central Sulawesi in 2019 in Sausu District, Parigi Moutong Regency, and 2021 in East Lore District. This group is known as the Mujahidin Indonesia Timur (MIT) Poso. According to [3], five factors cause terror organizations in Indonesia to emerge: first, the majority factor is Islam in Indonesia. Second, the education level factor. Third, socio-economic factors. Fourth, the factor of the leader who spreads teachings or doctrines about terrorists. Fifth, the geographical factor of Indonesia. Therefore, geographical factors are very favorable for terror groups. However, since there are still many forests and mountains in Poso, it is challenging for terrorist groups to be detected.

Many types of research on spatial analysis related to terrorism have been carried out. Some of them have been researched by Onat [4] about spatial correlation and terrorism using a risk field approach and by LaFree [1] about the spatial and temporal patterns of terrorist attacks that occur, or spatial multi-criteria parameters data overlay technique by Baskurt and Aydin [5], but in this research we used different parameters to identify a terrorist location. This research was conducted using a geospatial intelligence approach, a combination of remote sensing, GIS cartography, and big geospatial data to obtain data and analyze results. The US Federal Geographic Data Committee (FGDC) established a unique portal for geospatial data (www.geodata.gov) to support the government in various sectors [6]. Geospatial data that contain location information and the distribution of phenomena on the earth's surface related to the presence of terrorists is the main strength of this approach because it can detect various kinds of spatial data without direct contact. Therefore, the location of this research focuses on the Poso region, Central Sulawesi. To overcome all threats of terrorist, criminal and separatist groups from both state and non-state actors.

## II. LITERATURE REVIEW

### *A. National Defense*

According to Tippe [7], defense in political science is a concept that cannot separate from life. In order to survive, every living thing needs a sense of

security, which can happen for two reasons. First, for those who have power or a thirst for power, life is a power struggle. Second, for the weak states, defense is a way to gain a sense of security.

The science and art of defense is an applied science, which studies how to prepare the national resources of a country in times of peace and mobilize those national resources in the context of dealing with threats to the territorial integrity and sovereignty of a country, both domestic and foreign threat [8].

The concept of defense relations from a geographical point of view is explained by Supriyatno [8]. That is necessary to understand the location or spatial position of a country. Geography is a crucial component of political decision-making and action. Geography discusses national borders, natural resources, accessibility to and from ports, the division of provinces and districts.

### *B. Intelligence*

Intelligence is (1) Knowledge that enables civilian leaders and military commanders to consider alternative options and outcomes in decisions making; (2) Evidence and conclusions from it are obtained and furnished in response to user requirements. Types of intelligence include signals intelligence, imagery intelligence, human intelligence, other technical intelligence, and open-source intelligence [9].

The purpose of intelligence is to establish facts and then develop appropriate, reliable, and valid conclusions (hypotheses, estimates, conclusions, or predictions) for use in strategic decision-making or operational planning [10].

Intelligence is usually thought of as a conduit for information fraud. So the initial role of Intelligence was to provide opportunity analysis: identifying the potential for implementing fraud in operations plans. Others perceive Intelligence as having more credibility if they have to work hard or spend much money to get it. So the idea is to make Intelligence hard to come by and hard for the opponent to penetrate [11].

### *C. Geospatial Intelligence (GEOINT)*

GEOINT exploits and analyses geospatial imagery and information to describe, assess, and visually describes physical features and geographically referenced activities on Earth [12]. The most widely used combination model in intelligence analysis is the geospatial model. Geospatial modeling combines imagery, geospatial information (e.g., maps and charts), and location information from multiple sources to visually describe, assess, and visualize physical features and geographically referenced activities on Earth.

GEOINT is a relatively new intelligence discipline that promotes detailed data analysis and assessment of the operational environment and investigates problems dealing with that environment. It draws on and synthesizes a long tradition of strategic and tactical geographic knowledge, such as mapping, regional studies, and resource assessment [11]. GEOINT is an intelligence and tradecraft discipline (techniques, methods, and technologies used in modern espionage (spies) and generally, as part of intelligence activities) that have evolved from image integration, imagery intelligence (IMINT), and geospatial information [13].

The National Geospatial-Intelligence Agency (NGA) within the Department of Defense has the primary mission of providing timely, relevant, and accurate imaging, imaging intelligence, and geospatial information collectively known as GEOINT in support of national security. To support its mission, NGA sponsors research that builds the scientific foundation for GEOINT and strengthens the academic base, training the next generation of NGA analysts while developing new approaches to analytical problems [14].

### *D. Related Works*

Several researchers have carried out several studies related to remote sensing technology to determine a pattern, object, and trend of terrorism. In the research, [15] Supriyadi and Manessa explained an assessment related to the vulnerability to terrorism in Java Island using the Spatial Multi-Criteria Analysis (SMCA) method. This SMCA method generates and combines spatial data that describes the factors causing the phenomenon. The main parameters analyzed are the density of past terrorist attacks, areas of arrest, police/military facilities, government facilities, business centers, densely populated areas, and churches. Supriyadi and Manessa conduct research based on past acts of terrorism and the attractiveness of the targeted facilities. Their research can use as inspiration for our research related to the distribution of terrorism locations in several parameters to determine the distribution of terrorism locations.

Research related to the simulation of spatial-temporal patterns of terrorism incidents has been carried out by Hao, et al. [16] in the Indochina Peninsula with a GIS and the Random Forest method. Hao, et al. conducts research based on geospatial statistical methods to analyze the spatial-temporal evolution of terrorist attacks on the Indochina Peninsula. Machine learning Random Forest (RF) method was adopted to predict the potential risk of terrorist attacks on the Indochina Peninsula on a spatial scale with 15 driving factors. In Hao, et al. research, a machine-learning algorithm combines with a geo-information system to simulate the distribution of the risk of a terrorist attack at a pixel scale. Before the simulation, the spatial-temporal variations of terrorist attacks on the Indochina Peninsula analyze using the kernel density method. Hao, et al. research concludes that machine learning algorithms (e.g., RF) combined with GIS have excellent potential for simulating the risk of terrorist attacks. Hao, et al. research follows the approach used in our study, which utilizes a GIS to simulate potential terrorist hideout locations in mountainous areas.

Research with a visual-spatial approach to detecting criminal hotspots has been carried out by Sukhija, et al. [17] in Haryana, India. Sukhija, et al. research aims to highlight areas with a high crime

intensity that damages the environment of certain places. In Sukhija, et al. research, criminal hotspots were detected using a statistical analysis tool (SaTScan). They visualized the results with the help of GIS (Google Earth) to point to the location of crime-prone points at the district level. Sukhija, et al. research is similar to the research we did. Only the parameters used are different, namely in the Sukhija, et al. research [17] using the parameters of criminal events. In contrast, we used geographical parameters in our studies, such as water sources, land cover, slope, and settlements.

The utilization of GIS can be used to map crime and counter-terrorism. GIS provides technology that enables the data collection from LIDAR, aerial photography, and satellite imagery, that capturing, storing, analyzing, and displaying the data on maps. As Alharith and Samak [18] did in their research, they explained that fighting terrorism in the Kingdom of Saudi Arabia was more effective with the help of GIS Alharith and Samak research are related to our study utilizing GIS to map a specified parameter to make it easier for researchers to analyze an object or target.

## III. RESEARCH METHODOLOGY

### *A. Research Method*

This research was conduct using a GEOINT approach, a combination of remote sensing, GIS, and cartography to obtain data and analyze results. The massive use of geospatial data is the main characteristic of the GEOINT approach. Geospatial data containing location information and the distribution of phenomena on the earth's surface related to the presence of terrorists are the main strengths of this approach.

Multi-criteria decision is used in this research, meaning that few parameters are used to analyze data and get the result. All parameters use geospatial data in the same area, so the models that have been built by each parameter can overlay each other. Each parameter has a unique weight and sub-parameters that have their value.

### *B. Research Area*

The research location is in the mountains of Poso Regency and Parigi Moutong Regency, Central Sulawesi Province, as shown in Fig. 1 Precisely in Sausu District (Parigi Moutong District), Poso Coastal District, North Coastal Poso District, East Lore District, and North Lore District. The five sub-districts were choosing to be the focus locations because they are the locations for the emergence of terrorist cases around the Poso mountains. The research location focused only on these five sub-districts, not the entire Poso Regency administrative area.

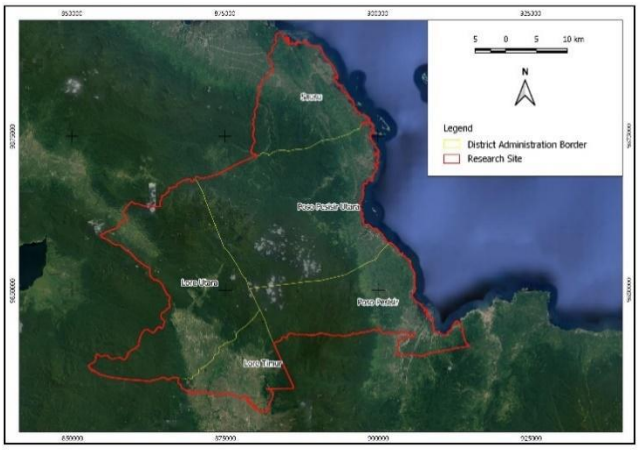


**Figure 1:** Research site administration map

The administrative areas of the five sub-districts cover a mountain range in the north-eastern part of the Poso Regency. The mountains became the headquarters of the MIT group, which until now had not successfully hunt down because they were hiding in the forest, as shown in Fig. 2. Although many terrorist cases appear in Poso Pesisir and Sausu sub-districts, it is necessary to include the Lore sub-district in the study area because the mountainous area is the primary location also part of the Lore sub-district. In geospatial studies, it is necessary to pay attention to the unity of the ecosystem or the region's unity, which is the mountains, because an area considers being still possible for the movement of terrorist actors outside the administrative boundaries of the sub-district.

### *C. Research Tools and Materials*

***1)*** The tools used in this research are:

*a)* Computer set: Intel Core i7, RAM 8 GB.

*b)* Software: ArcGIS 10.4 for spatial analysis and modeling. Microsoft Office 365 for scriptwriting.

*c)* Change number of columns: Select the Columns

***2)*** The material used in this research is:

*a)* DEM (Ina-Geoportal)

*b)* Google Image Basemap

*c)* Spatial Data from Ina-Geoportal

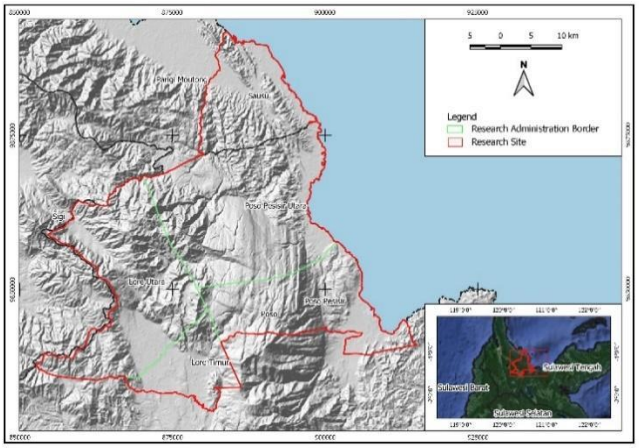


**Figure 2:** Hillshade map of the research area

### *D. Research Parameters*

The study used four parameters, namely water sources, slopes, settlements, and land cover. These four parameters are considered the factors most related to analyzing the location of terrorists in the mountains, and these four parameters have never been used in previous research. Each parameter has its subparameter, which will be described below.

The parameter of proximity to water sources is a parameter that uses the distribution of water flow as an analytical factor for the presence of terrorists. After all, terrorists are humans who need water to live, and it is essential to include the parameters of water sources in this study. The water source used is a river, not all tiny streams can be mapped, and if it is sufficient as a water source, only rivers are selected. The distance variation used is also tiered from 100 meters to more than 1000 meters. The choice of distance variation considers the ability of human activities to reach limited water sources because, in mountainous areas, human mobility is not as easy as in other areas regarding topography and land cover, which quite hinders mobility.

**Table I:** Water Source Parameter Values

| Water Source Subparameter | Values |
|---|---|
| 100 meters from the river | 5 |
| 500 meters from the river | 4 |
| 1000 meters from the river | 3 |
| more than 1000 meters from the river | 1 |

The slope parameter is related to the topography as a limiting factor in the mobility of terrorist actors as humans. The slope can also be a critical factor in finding their base because humans tend to choose to work on flat to gentle slopes, so the flatter the slope, the higher the value. The sub-parameters of slope classification is used Van Zuidam slope classification [19].

**Table II:** Slope Parameter Values

| Slope Parameter Subparameter | Values |
|---|---|
| 0 – 2 % | 5 |
| 2 – 7 % | 4 |
| 7 – 15 % | 2 |
| 15 – 30 % | 1 |
| > 30 % | 0 |

The settlements parameter is a parameter that concerns the relationship between terrorist actors and the supplies they need to survive while in their hiding place. A terrorist, as a human being who lives in nature, still needs supplies from his colleagues to survive in the forest. It could be food supplies, weapons, or just visiting his family who lives in nearby settlements. Therefore, one factor that allows terrorists to descend from the mountain regularly is the distribution of population settlements.

**Table III:** Settlement Parameter Values

| Settlement Subparameter | Values |
|---|---|
| 1000 meters from the settlement | 5 |
| 3000 meters from the settlement | 4 |
| 5000 meters from the settlement | 3 |
| more than 5000 meters from the settlement | 1 |

The land cover parameter is a parameter related to spatial information related to the presence of terrorists that can be extracted from remote sensing data, which in this case is a google image. Of course, the relationship between land cover and the presence of terrorists is dominant in areas with land cover conditions with minimal human activity. Land cover with minimal human activity, such as forest or shrubland cover classes. In contrast, land cover often includes human activities, such as built-up land or open land—the more minimal human activity, the greater the dignity of the subparameter class.

**Table IV:** Land Cover Parameter Values

| Land Cover Subparameter | Values |
|---|---|
| frequent human activities | 1 |
| Rarely human activities | 5 |

All parameters have their respective weights, which are arranged according to their spatial influence, the more significant these parameters, the greater the weight is set, the more critical the role of these parameters in analyzing terrorist locations in the mountains [4]. The weight range of 1-10 in this research was chosen because it was considered suitable for a multiparameter analysis study. The water source parameter has the most significant weight because it is considered the main factor in the survival of terrorist actors as humans, namely the need for water. While the slope has a reasonably significant weight because human activities need relatively flat slope conditions for activity needs. While the settlement and land cover parameters have a moderate weight because they are considered only supporting factors because it is possible that terrorist actors do not have to fulfill the prerequisite conditions for the settlement and land cover parameters.

**Table V:** Parameter Weight

| Parameter | Weight |
|---|---|
| water source | 10 |
| slope | 8 |
| settlement | 5 |
| land cover | 5 |

***E. Design and Research Phase***

The study was conducted using a weighted linear combination method. The quantification process was carried out on all spatial data used for each parameter related to the presence of terrorists in the mountains. Quantification is done by changing each sub-parameter class to a value in the range 1-5. Then each value will be weighted as a multiplier factor to get the final value.

The amount of weight on a scale of 1-10, each parameter has its weight value. The weight is a representative value of the critical value of that parameter to other parameters. In weighting, the greater the weight value, the more critical the parameter. In other words, the more significant the parameter values used in the analysis of terrorist locations in the mountains are. This also applies to the value of dignity in each sub-parameter. This also applies to the value of dignity in each sub-parameter. The greater the dignity, the more vulnerable the sub-parameter class is to terrorist locations in the mountains.

Equation (1) is the algorithm for weight linear combination methods [5]. Final weighting will be counted for all parameters, then will overlay one another. The overlay process is the core of this method because this process can combine various parameters to obtain new impactful information.

$$V(x_i) = \sum_j w_j v_j(x_i) = \sum_j w_j r_{ij} \quad (1)$$

$W_j$ is the weight of a parameter that has been normalized, as in this study is a weight of 1 - 10. The purpose of normalization is that the sum of all weights in all parameters must amount to 100%. The weight of each parameter will be normalized to a percentage proportional to 100. $V_j(X_i)$ is the value of each attribute $_j$, while $X_i$ = (xi1,xx2,…,xin) and $r_{ij}$ are the values that have been transformed into the same comparison scale, which in this study is 1 - 5. The weight of each parameter shows the relative importance of a parameter. The best alternative is finding the maximum value of V(xi) from i = 1, 2, 3, 4, 5.

This study has three data sources: DEM data, Google satellite imagery, and geospatial data from the Geospatial Information Agency taken from Ina-geoportal online. DEM is a compilation of data from various Radar remote sensing images with altitude information at a spatial resolution of approximately 8 meters. Google satellite imagery is a combination and compilation of various satellite images of various scales at a location to see and use the study area for the visual interpretation process. Then the geospatial data from Ina-geoportal is the official primary data issued by the government on a scale of 1:50,000, containing much information that can be directly used for mapping the required parameters.

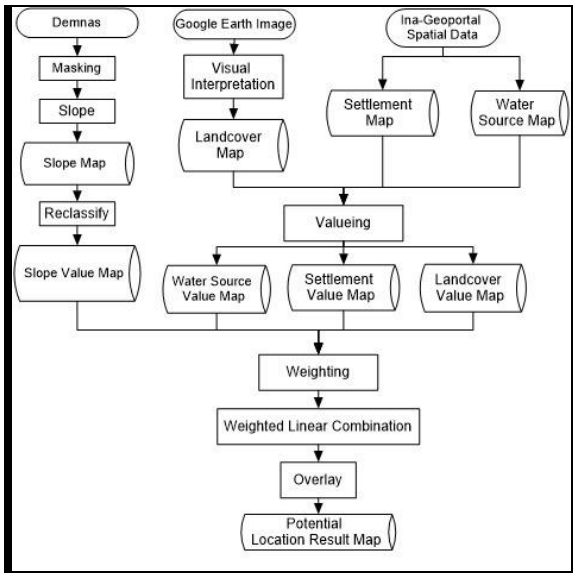


**Figure 3:** Research stages

DEM data for slope parameters are processed with ArcGIS software using the slope feature to find the slope percentage value. Then the results of the slope are classified using the Van Zuidam slope classification. Finally, the classification results are reclassified using ArcGIS to convert the value of each class into a slope grade map.

Google image data is used as input for the visual interpretation of land cover parameters. The visual interpretation was carried out for two land cover classes: the land cover class that was often human activities and the land cover class that was rarely human. The most dominant interpretation keys used are color and association. We will look for forms of land cover that, if human activity is rare, will be categorized as high value as areas prone to terrorist hiding locations.

Spatial data obtained from Ina-geoportal becomes an input for parameters of settlements and water sources. Because the data is official, there is no need for advanced processing, only feature selection is required, and it is displayed in a parameter map with proper symbolization. Then the rating is carried out according to the predetermined value to get a map of the parameter values for water sources and settlements.

The stages of the research after obtaining a map of all parameters are weighting. The weighting is carried out according to the weight of each parameter as a multiplier factor so that the final value will be obtained. The final value of the weighting process using the weighted linear combination formula will be classified again into five classes using an equal interval classification to get the final result in the form of a map of potential terrorist locations.

## IV. DATA ANALYSIS AND DISCUSSION

### *A. Locus Profile*

Poso Regency has 8,712.25 km2 and consists of 19 sub-districts based on BPS data in 2020. This area is located in the range of the Fennema and Tineba Mountains in the west, the Takolekaju Mountains in the southwest, the Verbeek Mountains to the southeast, the Pompangeo, and Lumut Mountains in the northeast. Based on its geographical position, the western boundary of Poso Regency is Donggala Regency and Parigi Moutong Regency. Based on these limits, this research focused on mountainous areas in parts of the Parigi Moutong Regency.

Parigi Moutong Regency was formed based on Law No. 10 of 2002. It has a 6,231.85 H coastline of ± 472 Km, stretching from Maleali Village, Sausu District to Sejoli Village, Moutong District. It has 23 sub-districts, 252 villages, and five sub-districts. The total population (as of 31 December 2013) was 522,026 people, 268,427 men and 253,599 women. The geographical location of Parigi Moutong Regency is 0.75 North Latitude - 1º South Latitude and 120 - 121.5º East Longitude.

### *B. Result of Quantitative Data A*

This study starts the collection, then processed using a Geographic Information System to get results from several parameters used. The following is an explanation of each of the research results.

***1)*** Parameter map: Based on the parameters used in this study, the data collected following these parameters are considered the factors most related to the analysis of the location of terrorists in the mountains and then processed and sorted according to the location of the research focus to obtain various parameters maps. A map and explanation of each of these parameters can be seen below.

*a)* Water source-map: Based on the river map data published by BIG and then pasted it with the research area, it was found that in the study area, there are two classifications of water sources in Fig. 4, namely a river that is visualized in thick blue, a river with a width of more than 25 meters and a small river which is visualized blue. Thin with a width of fewer than 25 meters.

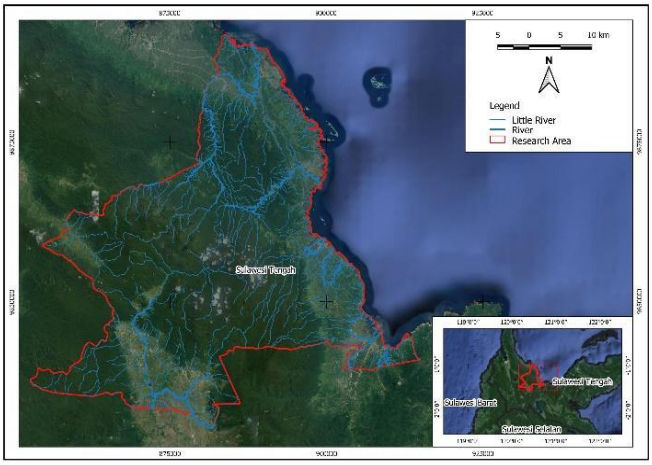


**Figure 4:** Map of water source parameter

*b)* Slope map: This slope data uses DEMNAS data as a data source managed by BIG and then overlaid with the research area and analyzed the slope level. The visualization can be classified based on the slope range of 0%->30%. From the map above, it can be concluded that the slope conditions in this study area are dominated by values 0-15% with dark green to yellow visualization.

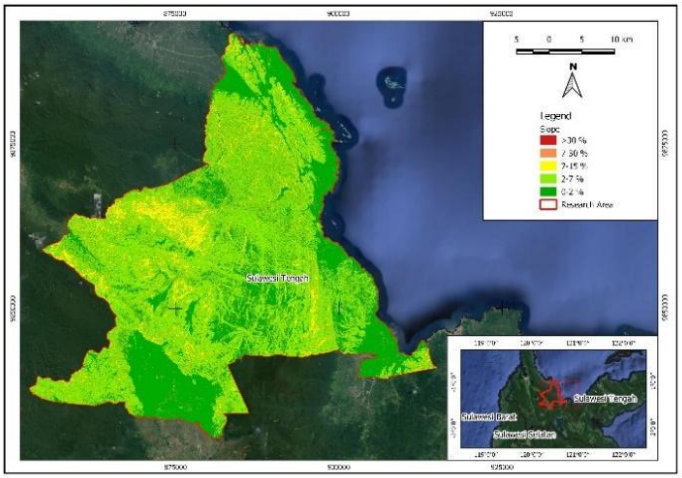


**Figure 5:** Map of the slope parameter

*c)* Settlement map: The settlement data on this settlement parameter map was obtained from Ina-Geoportal managed by BIG and then pasted with the research area. The distribution of settlements visualized in orange can be seen at the research location.

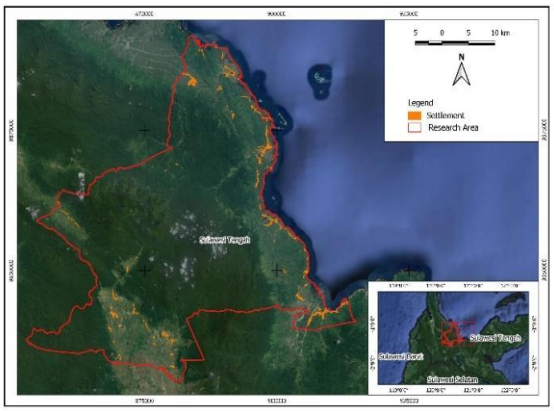


**Figure 6:** Map of settlement parameter

*d)* Land cover map: The land cover data used in this parameter is taken from Google imagery extracted using a terrorist hideout approach dominant in land-covered areas and minimal human activity. For this reason, the land cover obtained is explicitly classified into two, namely infrequent activity and frequent activity. From this classification, it can be visualized, is given as shown in Fig. 7.

***2)*** Value map: The parameter data above will be used as input to be processed and given dignity as a subparameter of the terrorist presence analysis approach to obtain a map of dignity. The map, along with an explanation of each of these parameter values, can be seen below.

*a)* Water source parameter value map: By assigning dignity to the water source parameters, the location with a certain radius from the water source can be known. As seen on the map, the closest location is visualized in red and the farthest in green.

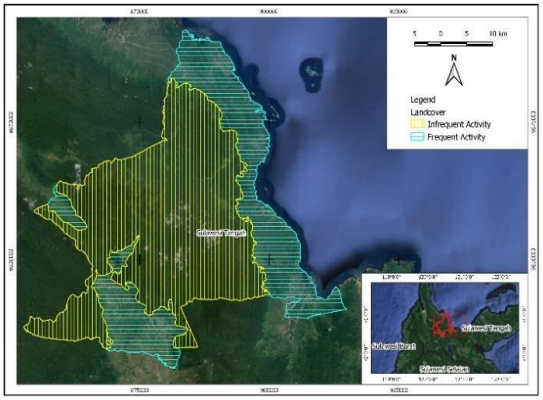


**Figure 7:** Map of land cover parameter

*b)* Slope parameter value map: As visualized on the map in Fig. 9, the red and orange areas are relatively flat. Red is a flat area, and dark green is an extreme slope of above 30%.

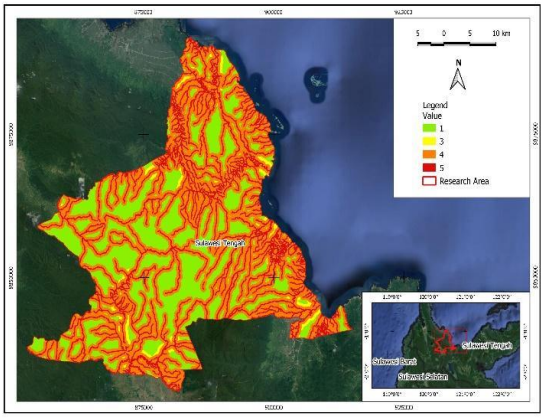


**Figure 8:** Water source parameter value map

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*c)* Settlement parameter value map: The settlement parameter map is given a rating to determine the potential area of terrorist presence based on the classification of distances from residential areas ranging from 1000 meters to more than 5000 meters.

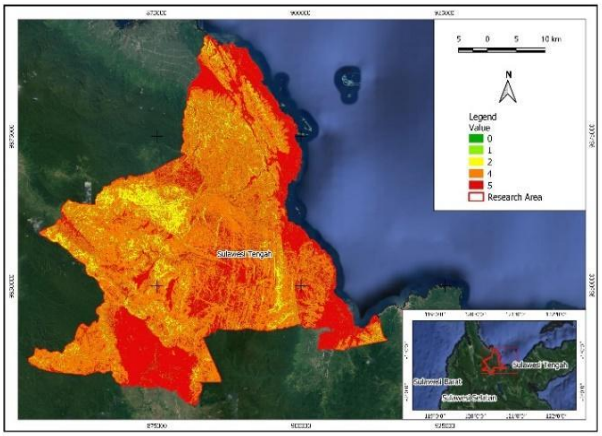


**Figure 9:** Slope parameter value map

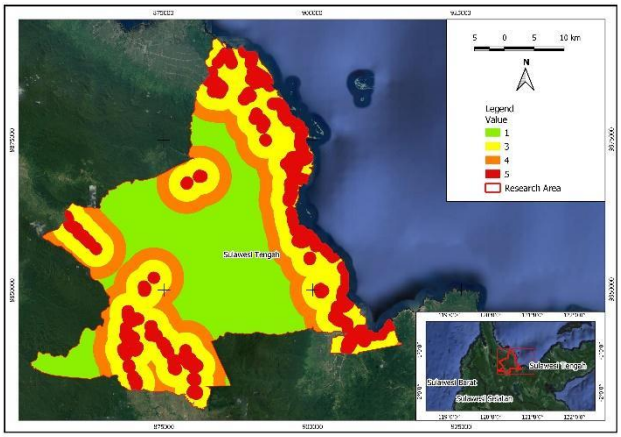


**Figure 10:** Settlement parameter value map

*d)* Land cover parameter value map: According to the activity level, giving a score for land cover parameters, namely 1 for areas that are often visualized in green and 5 for areas that rarely have activities in red.

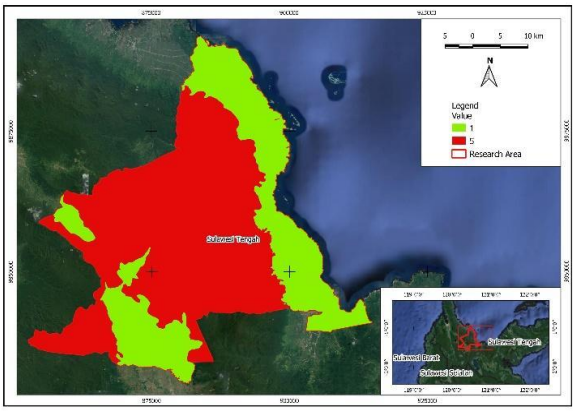


**Figure 11:** Land cover parameter value map

### *C. Discussion*

The discussion in this study refers to the Literature Review Chapter 2, Research Methods Chapter 3, and Research Results in Chapter 4 previously divided into two sub-sections, namely the discussion of the implementation of Geoint technology to predict terrorist

hideouts and the implementation of Geoint technology in determining the location of terrorists in Poso. In order to improve the National Defense and Security Systems.

***1)*** Implementation of GEOINT technology to predict terrorist hideouts: Based on Fig. 8, the map data has been given a rating with the most potential locations visualized in red, namely the area closest to the water source. Humans still need a water source to survive, so the most potential location is close to a water source.

In the slope map data, Fig. 9, the value is given to the data is used to analyze areas with relatively flat slopes that can become potential hideouts for terrorists. For example, the red color visualized on the map is a flat area, so that the area is considered the most potential criteria for the presence of terrorists.

Fig. 10 is a map of the value of settlements, which is data that has been classified based on the value of infrequent and frequent activities, and visualized on a map in red as the most potential area because as a human need, it will still need food supplies to survive or terrorists touch residents in his actions. Therefore, this analysis based on settlements is carried out to obtain locations far from settlements but can still reach these residential areas with a distance of 3-5 km.

In this study, land cover analysis is used, as shown in Fig. 11, to determine areas with minimal activity as areas with the potential for terrorists. The visualization on the map is red as a potential area.

Various data parameters assessed can be used as a GEOINT technology approach in finding possible locations for the presence of terrorists with parameters such as water sources, slopes, settlements, and land cover and their sub-parameters as values for the possibility of terrorists.

***2)*** Implementation of GEOINT technology in determining the location of terrorists: It has been discussed how the implementation of Geoint in predicting the possibility of hiding terrorists. However, the terrorism case in Poso, as it is known, has not yet ended, and according to information, the terrorist group is hiding in a mountainous area. So in this study, the possibility of terrorism will be narrowed down again by implementing Geoint technology, namely by analyzing the four parameters with a weighting method.

From the four parameters that have been assigned, a value to the sub-parameter, namely dignity, will use as input for analysis by weighting, where the weight of each parameter will be calculated based on the sub-parameter of dignity to predict the presence of terrorists.

The map generated from the weighting analysis above is reclassified so that it is easy to understand and re-analyzed based on the resulting map with color classification, that red is an area that has the potential to be a terrorist hiding place in the mountainous area on the border of Poso Regency and Parigi Moutong Regency.

The map of the possible terrorist locations in the mountains can be seen in Fig. 12 below.

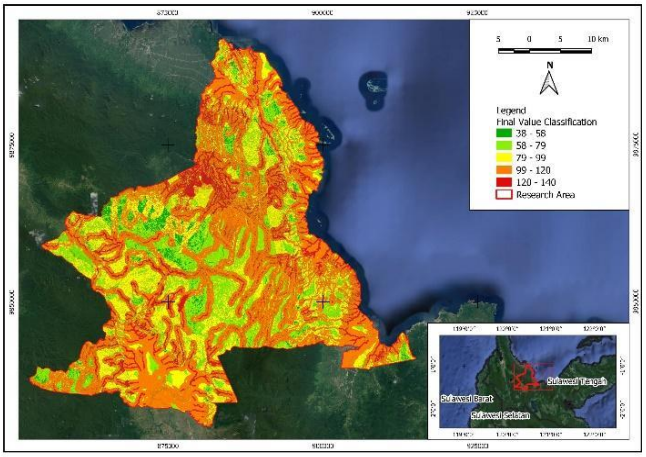


**Figure 12:** Map of potential results of terrorist locations in the mountains

Based on the results of a map of potential terrorist locations in the mountains in Parts of Poso Regency and Part of Parigi Moutong Regency, it can be seen the index listed in the legend which explains that based on the level of green to red, namely green for areas with the least potential for hiding and red for areas the most potential for hiding.

With the results of the initial analysis in this study, it is hoped that it can be a guide for the implementation of Geoint technology in determining the potential presence of terrorists in the mountains and be able to become a reference for military operations in eradicating terrorism in order to improve the defense and security system of the country.

## V. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the analysis and discussion regarding the Development of Intelligence

Information Technology to Support the Interests of National Defense in the previous chapter, it can be concluded that the use of GEOINT information technology can be implemented for initial analysis in determining potential terrorist hideouts and the use of information technology GEOINT can be implemented for initial analysis in determining the potential location of terrorists in the mountains and capable of being a reference for military operations in eradicating terrorism in order to improve the defense and security system of the country.

This research recommends that it is necessary to analyze other parameters, such as historical parameters of terrorist events, intelligence information parameters, and aerial photo images.

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