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Geospatial Intelligence Analysis to Predict Acts of Security Disturbance by KSTP in Nduga Regency, Papua Mountainous Province

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Abstract
The problem of security disturbance actions with the aim of separatism, which has been carried out by the Papuan Separatist Movement Organization (KSTP), has resulted in many casualties, both civilians and TNI and Polri security forces, and threatens security stability in Papua. Intelligence is central in thwarting and eliminating threats to state sovereignty through active and systematic observation of potential threats, facilitating early detection. This research aims to provide an overview of the importance of geospatial intelligence (GEOINT) analysis in predicting the actions of security disturbances by KSTP in Nduga Regency, Papua Mountainous Province. The research method employed is the GEOINT methodology, based on the Mellion model, which comprises planning, information collection, processing, analysis, and dissemination phases. The results of the research conducted, namely GEOINT, have an important role in supporting the implementation of intelligence operations in Nduga Regency, because it produces a visual picture of the movement of KSTP through the geocoding process of security disturbance action information for the period May 2022 to June 2023.

1. Introduction

The movement of separatism continues to occur today in Papua because there are still some indigenous Papuans (OAP) who demand to be able to separate themselves from the Unitary State of the Republic of Indonesia (NKRI), even though de facto and de jure, Papua is part of the territory of NKRI (Mukhtadi, 2021). The separatist movement aims to separate itself from the Republic of Indonesia, which, in its journey in each era, experiences its own dynamics. Along with the development of political dynamics in Indonesia, post-1998 reforms that provide freedom of democratic space and freedom of opinion are utilized by the Papuan separatist movement to show its existence by carrying out various activities, both politically and armed violence, to gain international attention by utilizing certain moments or commonly known as "crucial Papuan days" (Napoleon, 2017). This gives significance that acts of armed violence in Papua carried out by the Papuan Separatist Movement Organization (KSTP) were carried out to gain support from foreign parties for the struggle for Papuan independence.

The complexity of the security disturbance actions carried out by the Papuan Separatist Movement Organization (KSTP) ultimately greatly affects the turmoil of the national security situation. According to data from the Cartenz Peace Operation Task Force, in 2023, KSTP committed at least 209 incidents of armed violence, which resulted in 79 fatalities (Katingka, 2023).

Based on what is shown in Figure 1. Above, the movement of KSTP disturbances in Papua is still a threat that needs to be taken seriously by the Government of Indonesia, because it has caused many casualties. To face the threats and challenges of separatism movements in the form of acts of security disturbances carried out by KSTP, it is necessary to prioritize intelligence activities in the form of intelligence activities and operations. The task of intelligence is to thwart and eliminate threats to state sovereignty through active and systemic observation of potential threats in the form of early detection (Saronto, 2020). One form of active and systemic observation can be done by utilizing Geospatial Intelligence (GEOINT).

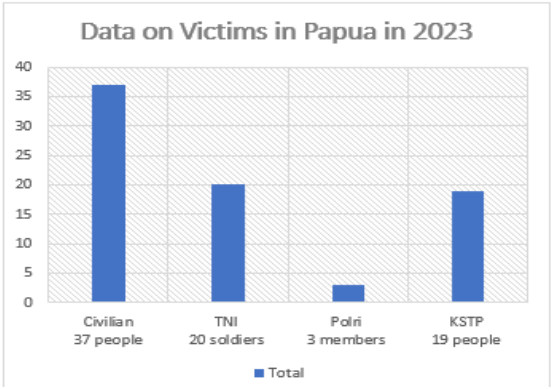


Figure 1. Data on Victims in Papua in 2023
Source: Compiled from Data of the Cartenz Peace Operation Task Force, 2023

There are several studies related to GEOINT that are used to analyze the movement or location of separatist and terrorist groups, such as Hutomo et al (2022), which in their research concluded that GEOINT is useful for providing information about the location or position of KSTP, as well as the routes they use in carrying out security disturbance actions. Meanwhile, in the research of Utomo et al (2021), GEOINT information technology can be implemented for initial analysis in determining terrorist hideouts as a reference for military operations in combating terrorism. As for this research, it prioritizes the utilization of GEOINT analysis of KSTP movements based on the trend of actions carried out as a prediction reference in the context of early detection to prepare for the anticipation of possible movements of security disturbance actions carried out by KSTP in the future.

2. Literature Review

2.1. Intelligence

Miller (2022) defines intelligence as structured information or data collected, analyzed, and disseminated for various institutional purposes. Based on its category, intelligence can be categorized into human intelligence (HUMINT), signal intelligence (SIGINT), imagery intelligence (IMINT), open-source intelligence (OSINT), social media intelligence (SOCMINT), and geospatial intelligence (GEOINT). In today's era of technological advancements, increasingly varied forms of electronic intelligence emerge and influence the development of intelligence itself.

Furthermore, intelligence collects and analyzes information for national security as an institutional responsibility. National security concerns internal and external threats originating from state and non-state actors, such as terrorist groups. Therefore, intelligence officers must have three abilities: the ability to verify information through direct observation, the ability to collect information, the ability to analyze information into intelligence, and the ability to gain propositional knowledge.

2.2. Geospatial Intelligence

Geospatial Intelligence (GEOINT) is part of the development of geographic information science combined with intelligence activities and technology. According to Gehlen et al. (2019), GEOINT is the ability to solve problems through spatial relationships that support spatial analysis techniques using geocoding. Geocoding is the process of converting textual information describing a location to a digital geographic representation (Goldberd et al., 2013).

Perazzoni et al. (2020) mentioned that GEOINT consists of images, imagery intelligence (IMINT), and geospatial information. The explanation is, first, imagery is a visual record of the environment and various activities related to geographic position data produced through satellites, aerial platforms, and drones; second, IMINT is a technique for extracting useful information from the interpretation or analysis of images and data; third, geospatial information is information related to the Earth's surface that identifies location, geometry, and other environmental attributes.

2.3. Prediction

Goldman (2006) defines prediction as a statement about an estimate of time, place, and a future event with an achievement close to certainty. Meanwhile, according to Verhagen (2022), prediction generates predictive values from data by applying an estimation model to a set of explanatory data that leads to an analytical perspective on a phenomenon. Therefore, it can be concluded that prediction is a form of effort to estimate opportunities for future events/events by utilizing data and analyzing data series/history.

2.4. Papuan Terrorist Separatist Group (KSTP)

According to Heraclides (1991), a separatist movement is a political activity of a violent or non-violent nature that aims to liberate itself or form its own government. There are at least three fundamental variables that are interrelated in the separatism movement in a country, namely, first, having a territory and territorial base for collectivity; second, the existence of human groups that collectively define themselves differently; third, there are different types of relationships between the government and the collectivity of groups that define themselves differently.

The emergence of separatist movements involving acts of violence can then be included in the category of acts of terror because there are acts of murder, guerrilla warfare in urban and rural areas, and so on. These acts of violence are caused because the state is "perceived" to be institutionally weak and unable to be responsive to their demands (Kingsbury, 2021). Therefore, on April 29, 2021, Prof. Dr. Mohammad Mahfud, MD, S.H., S.U., M.I.P. (Coordinating Minister for Political, Legal, and Security Affairs of the Republic of Indonesia) designated organizations or Armed Criminal Groups (KKB) that often commit acts of terror and violence against civilians and the TNI-Polri as "Terrorists" (Yahya & Hakim, 2021).

3. Methodology

The GEOINT methodology applied during this study uses the Intelligence Cycle Wheel based on the Mellión model adapted by Perazzoni et al. (2020), namely the planning, information collection, processing, analysis, and diffusion phases. The use of the GEOINT methodology based on the Mellión model is considered to meet the research needs in conducting Geospatial Intelligence analysis that produces an early detection of intelligence in the form of predictions as part of active and systemic observation of potential threats to security disturbance actions carried out by KSTP.

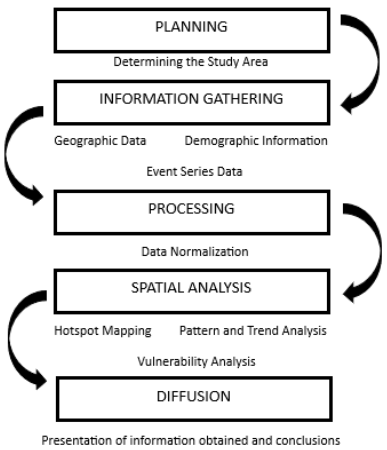


Figure 2. GEOINT Methodology Model Meliion

4. Results and Discussion

4.1. Research Results

1. Planning (Study Area)

The Papuan Separatist Movement Organization (KSTP) is the main source of problems in Papua, which continues to create chaotic situations in the form of terror and violence committed. The government continues to strive to deal with the threats and demands of separatism from KSTP on behalf of the Papuan people. One of the areas where the KSTP movement is active in carrying out acts of security disturbance is in Nduga Regency, Papua Mountainous Province. Referring to the basic variables of the separatism movement in a country, according to Heraclides, A. (1991), shows that KSTP has a territory and territorial base to group collectively. This territory and territorial base are then used as an action area and a defense from the pursuit of security forces trying to enforce the law.

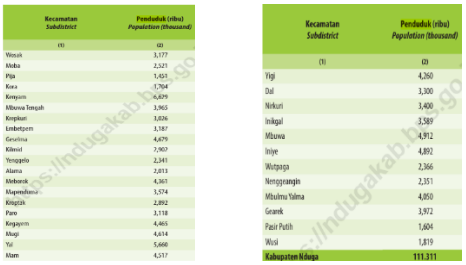
Figure 3. Nduga Regency, Base of KSTP

Based on the results of Figure 3, the study area to be addressed is the base area of the Nduga KSTP movement led by Egianus Kogoya, which is located in Nduga Regency, Papua Mountainous Province. Egianus Kogoya and his group are actively carrying out a series of security disturbance actions, at least currently having 50 sympathizers/members with a strength of weaponry of around 19 shots of various military standard firearms.

2. Information Gathering

a. Demographic Information

Based on the results of the population census by BPS in 2023, the population in Nduga Regency was 111,311 people with the highest population density in Mapenduma District of 57.3 people / km2, and the lowest population density in Alama District of 0.5 people/km (2) (BPS Jayawijaya Regency, 2024)



Kecamatan *Subdistrict*	Penduduk (ribu) *Population (thousand)*
(1)	(2)
Yigi	4,260
Dal	3,300
Nirkuri	3,400
Inikgal	3,589
Mbuwa	4,912
Iniye	4,892
Wutpaga	2,366
Nenggeangin	2,351
Mbulmu Yalma	4,050
Geank	3,972
Pasir Putih	1,604
Wusi	1,819
Kabupaten Nduga	**111.311**

Figure 4. Population of Nduga Regency per Year in 2023

b. Geographical Data

Nduga Regency was formed on January 4, 2008, as part of the expansion of Jayawijaya Regency. As of July 25, 2022, Nduga Regency became part of the Papua Mountain Province after the ratification of the expansion of 3 New Autonomous Regions (DOB) in Papua.

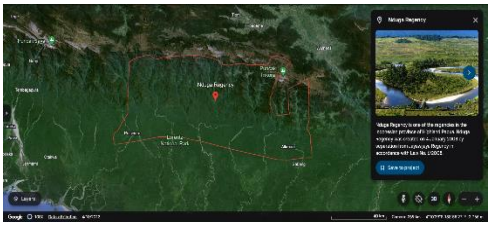


Figure 5. Nduga Regency, Papua Mountainous Province

The geographical location of Nduga Regency is astronomically located between 137.40 ° -139.00 ° East Longitude and 4.00 ° -4.60 ° South Latitude, with the capital located in Kenyam District. The area of Nduga Regency reaches 12,941 KM2with a total of 32 districts. The administrative boundaries of Nduga Regency, namely the north, are bordered by Lanny Jaya Regency and Puncak Jaya Regency; Asmat Regency borders the south; Yahukimo Regency and Jayawijaya Regency border the east; and Mimika Regency borders the west. The elevation of Nduga Regency reaches 2,000-2,500 meters above sea level with an average temperature of 14-25 °C. Eighty percent of Nduga Regency is protected forest in Lorentz National Park.

c. Event Data Series 2022-2023

Table 1. Security Incidents in Nduga

No.	Date	Location	Description
1	3 May 2022	Kp. Kuari Bawah, Kenyam District	Security disruption actions by KSTP against MuPe Yonif-3/Marines Task Force personnel.
2	7 June 2022	Kenyam Airport, Kenyam District (CO. 54M 209583 9490880)	The shooting down of the SAM AIR PK-SMG aircraft by KSTP Nduga.
3	16 July 2022	Kp. Nonggolait, Kenyam District	The shooting of civilians resulted in 12 deaths and 2 injuries.
4	7 February 2023	Paro District	The burning of the Susi Air Pilatus Porter PC 6/PK-BVY aircraft and the kidnapping of pilot Philip Mark Merthens (a New Zealand citizen).
5	3 April 2023	Kp. Yal, Yal District	An attack on personnel from the R 321/GT Infantry Battalion Task Force resulted in the death of one personnel member.
6	9 April 2023	Kp. Mam, Mam District	A firefight between the R 321/GT Infantry Battalion Task Force and the KSTP resulted in one personnel sustaining gunshot wounds.
7	26 May 2023	Kp. Nonggolait, Kenyam District	Shooting attack by KSTP against joint TNI-Polri forces.
8	30 May 2023	Mugi District	The firefight between the Joint Forces and KSTP resulted in three personnel killed and four others wounded.
9	22 June 2023	Kenyam Airport, Kenyam District	Security disruption by KSTP Nduga against officers securing the airport.
10	26 June 2023	Kenyam Airport, Kenyam District	Security disruption by KSTP Nduga toward Susi Air PK BVJ aircraft on the Wamena – Kenyam route.

3. Data Processing

In the data processing phase, all the information that has been compiled is collected, and the data format is standardized to facilitate further analysis.

Table 2. Summary Table of Data

No.	Regency	District	Total security disturbances	Victims	Population
1.		Kenyam District	6 times	12 civilians were killed and 2 civilians were injured.	6.629 people
2.		Paro District	1 times	1 pilot, Philip Mark Merthens (New Zealand national), was taken hostage.	3.118 people
3.	Nduga	Yal District	1 times	1 member of the Indonesian Armed Forces was killed.	5.660 people
4.		Mam District	1 times	One member of the Indonesian Armed Forces suffered a gunshot wound.	4.517 people
5.		Mugi District	1 times	Three members of the Indonesian Armed Forces were killed, and four others were seriously injured.	4.614 people
			Total: 10 incident	Total : Sixteen people died, 7 people were injured, and 1 foreign national was taken hostage.	Total: 24.538 people

4. Spatial Analysis

a. Hot Spot Mapping

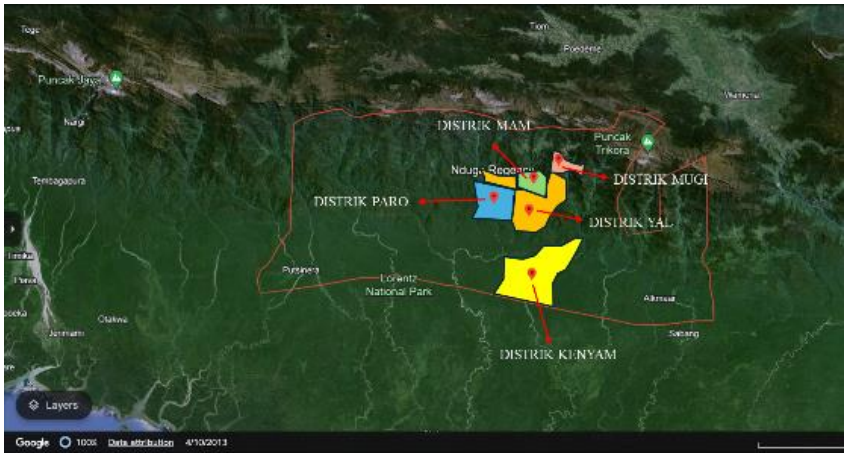


Figure 6. Five Districts with HotSpots for Security Disturbance by the Nduga KSTP

Based on Figure 6, the hot spots of security disturbance actions by the Nduga KSTP led by Egianus Kogoya occurred in five districts: Kenyam District (Capital of Nduga Regency), Paro District, Yal District, Mam District, and Mugi District.

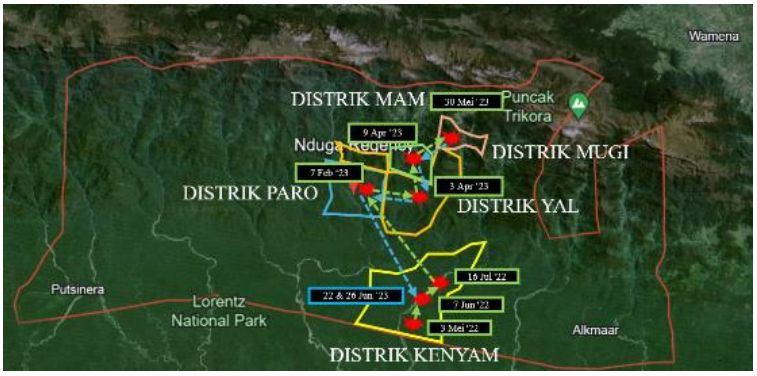


Figure 7. Mapping of the Route of Security Disturbances by KSTP Nduga

The image displayed in Figure 7 results from geocoding in converting the textual information in Table 2. Security Disturbance Events in Nduga Regency in 2022-2023 are described using a digital geographic representation to produce a visual explanation of the route of the security disturbance action carried out by the Nduga KSTP led by Egianus Kogoya. As for the spatial analysis of hot spot mapping that has been carried out, the route of security disturbance actions carried out sequentially from the south of Kenyam District on May 3, 2022, to the north of Mugi District on May 30, 2023. The security disturbance action was again carried out in Kenyam District on June 22 and 26, 2023.

b. Vulnerability Analysis

Suppose the average population of Nduga Regency, from 32 districts and a total of 111,311 people, reaches 3,478. In that case, it can be concluded that the Nduga KSTP tends to carry out security disturbance actions in areas with high population numbers, such as in Kenyam District with a population of 6,629 people, Yal District with a population of 5,660 people, Mam District with a population of 4,517 people, and Mugi District with a population of 4,614 people. Meanwhile, Paro District does have a population below the average population of Nduga Regency. Still, this location is often used as a base and crossing route in acts of security disturbance. This then proves that the Nduga KSTP led by Egianus Kogoya makes areas with a large number of civilians the main target of terrorist acts of armed violence.

5. Diffusion

Referring to the presentation of data in the form of planning, information collection, data processing, and spatial analysis carried out, the following information can be presented, namely, the movement of the Nduga KSTP Leader, Egianus Kogoya, is still actively carrying out acts of security disturbances and armed terror targeting civilians and security forces. During the period May 2022 to June 2023, there were at least 10 acts of security disturbances by KSTP Nduga Leader Egianus Kogoya, which resulted in as many as 16 people dying, 7 people being injured, and 1 foreigner being taken hostage. Based on the results of spatial analysis, hot spots of security disturbances by KSTP Nduga led by Egianus Kogoya occurred in five districts, namely Kenyam District (Capital of Nduga Regency), Paro District, Yal District, Mam District, and Mugi District. Based on the geocoding results, the route of the security disturbance action was carried out sequentially from the south of Kenyam District on May 3, 2022, to the north of Mugi District on May 30, 2023, and the security disturbance action was again carried out in Kenyam District on June 22 and 26, 2023

4.2. Discussion

The discussion in this research refers to section 2 of the literature review, section 3 of the methodology, and section 4 of the research results. Geospatial intelligence analysis in the context of predicting acts of security disturbance by KSTP in Nduga Regency.

1. GEOINT application for intelligence operations in Nduga Regency

GEOINT has an important role in supporting the implementation of intelligence operations in Nduga Regency. In its application, intelligence collects information on security disturbance

actions carried out by non-state actors, namely the Nduga KSTP led by Egianus, to gain international attention to demand independence for Papua from May 2022 to June 2023, as described in Table 1. Intelligence officers then verify information by prioritizing HUMINT about the existence of KSTP Nduga, which is juxtaposed with the results of GEOINT related to the points of security disturbances that occur to produce a mapping of the route of travel of security disturbance actions by KSTP Nduga in Figure 7. The results of the collection of information on the occurrence of security disturbance actions are then used as a data series/history to help the analysis process to predict the actions of security disturbances by KSTP in Nduga Regency in the future.

As for the application of GEOINT for intelligence operations in Nduga Regency, it will provide a visual picture through the geocoding process so that it is more easily understood by end users, including security forces such as Kodam XVII/Cenderawasih, Polda Papua, and the ranks of the TNI-Polri Task Force in Nduga Regency, to carry out the anticipation of armed terror acts carried out by KSTP, including as a consideration for TNI-Polri security forces in placing troops to carry out law enforcement.

2. GEOINT analysis to predict the action of security disturbances by KSTP in Nduga Regency

To conduct a GEOINT analysis, the methodological approach uses the Mellión model adapted by Perazzoni et al. (2020), consisting of a planning, information gathering, processing, analysis, and diffusion phases. Each phase is more commonly known in intelligence activities as the Rotating Wheel of Intelligence. First, in the planning phase, it is very important to consider the study area and know about the target of the operation to be addressed, namely the Nduga KSTP led by Egianus Kogoya, who has an area and territorial base in Nduga Regency, Papua Mountainous Province. Second, after knowing the basic data of the opposing forces and the intended study area, it is necessary to collect information such as geographical data presented in Figure 5, demographic information shown in Table 4.1, and disturbance actions taken based on time, location, and description of actions taken as described in the data series/history in Table 4.2. Third, from all the information that has been collected, data processing is then carried out to standardize the data format in the form of a Recapitulation Table in Table 4.3, making it easier for intelligence analysts to conduct data analysis.

In the fourth phase, the core of all stages was carried out, namely carrying out spatial analysis by relying on geocoding to describe the hot spot points that became the center of the Nduga KSTP movement, including mapping the travel route of the security disturbance action by the Nduga KSTP in Figure 7 to find the pattern of movement they carried out during the predetermined period during the period May 2022 to June 2023. Finally, the fifth phase is the presentation of information and conclusions to end users, as well as relevant stakeholders, as part of efforts to safeguard national security interests and institutional intelligence accountability.

The form of prediction that can be done from the GEOINT analysis results is to help estimate the time and place of occurrence. The form of security disturbances in the future by the separatism movement in Nduga, generated from the data series of security disturbance actions and GEOINT spatial analysis that produces a visualization of the mapping of the separatism movement route in Nduga. The findings of the GEOINT analysis conducted in the time period May 2022 to June 2023 showed that KSTP carried out security disturbance actions sequentially from the south of Kenyam District on May 3, 2022, to the north of Mugi District on May 30, 2023. The security disturbance action was again carried out in Kenyam District on June 22 and 26, 2023. Therefore, the findings of the movement pattern of this KSTP can be used as the basis for intelligence predictions for the benefit of the readiness of the TNI-Polri security forces in Nduga Regency in anticipating further actions that could cause more victims due to armed terror, including supporting law enforcement efforts more accurately against the separatism movement led by Egianus Kogoya.

5. Conclusion

Referring to the results of the research that has been done, the GEOINT analysis of data series/history of security disturbance action information can be utilized by intelligence analysts to predict security disturbance actions carried out by KSTP in Papua. The visual form generated from the geocoding process will provide convenience for end users, including security forces in Nduga Regency, in anticipating acts of security disturbances committed by KSTP, including being used as a consideration for TNI-Polri security forces to place troops to carry out law enforcement processes.

References

Badan Pusat Statistik Kabupaten Jayawijaya. (2024). Kabupaten Nduga dalam Angka 2024. Badan Pusat Statistik. https://ndugakab.bps.go.id/publication/2024/02/28/f4ae94e2bb4072aa201af775/kabupaten-nduga-dalam-angka-2024.html

Gehlen, M., Nicola, M. R. C., Costa, E. R. D., Cabral, V. K., Quadros, E. L. L., Chaves, C. O., Lahm, R. A., Nicolella, A. D. R., Rossetti, M. L. R., & Silva, D. R. (2019). Geospatial Intelligence and Health Analytics: Its Application and Utility in a City with High Tuberculosis Incidence in Brazil. *Journal of Infection and Public Health, Vol. 12*(5), 681-689. https://doi.org/10.1016/j.jiph.2019.03.012

Goldberg, D. W., Ballard, M., Boyd, J. H., Mullan, N., Garfield, C., Rosman, D,m Ferrante, A. M., & Semmens, J. B. (2013). An Evaluation Framework for Comparing Geocoding Systems. *International Journal of Health Geographics, Vol. 12*(50). https://doi.org/10.1186/1476-072X-12-50

Goldman, J. (2006). *Words of Intelligence-A Dictionary*. USA: Scarecrow Press, Inc.

Heraclides, A. (1991). *The Self-Determination of Minorities in International Politics*. London & New York: Routledge Taylor & Francis Group.

Hutomo, A., Gultom, R. A., Purwantoro, S. A. (2022). Penggunaan Geoint pada Operasi militer dalam Penanggulangan KKB Papua dengan Operabilitas pada Sistem K4IPP. *CITIZEN: Jurnal Ilmiah Multidisiplin Indonesia, Vol. 2*(1), 153-158. Doi: 10.53866/jimi.v2i1.44

Katingka, N. (2023). *Sepanjang 2023, 79 Orang Tewas Akibat Konflik di Papua*. Diakses pada 17 Juli 2024 dari https://www.kompas.id/baca/nusantara/2023/12/25/79-meninggal-akibat-konflik-di-papua-selama-2023-37-masyarakat-sipil-ikut-terbunuh

Kingsbury. (2021). *Separatism and the State*. New York: Routledge.

Miller, S. (2022). National Security Intelligence Activity: A Philosophical Analysis. *Intelligence and National Security, Vol 37, No. 6,* 791-808. https://doi.org/10.1080/02684527.2022.2076329

Mukhtadi. (2021). Strategi Pemerintah dalam Penanganan Gerakan Separatis Papua dan Implikasinya terhadap Diplomasi Pertahanan Indonesia. *Jurnal Diplomasi Pertahanan, Vol. 7*(2), 85-94. https://doi.org/10.33172/jdp.v7i2.729

Napoleon, Abdul H. (2017). *Analisis Anatomi Gerakan Separatis Papua Ditinjau dari Ilmu Administrasi Publik dan Penanganan Pemerintah Secara Komprehensif Holistik dalam rangka Menjaga Keutuhan Wilayah NKRI*. Jakarta: Universitas Krisnadwipayana.

Perazzoni, F., Nicolau, P. B., & Painho, M. (2020). Geointelligence Against Illegal Deforestation and Timber Laundering in the Brazilian Amazon. *ISPRS Internasional Journal of Geo-Information, Vol. 9*. doi:10.3390/ijgi9060398

Saronto, Y.W. (2020). *Intelijen: Teori Intelijen dan Pembangunan Jaringan*. Yogyakarta: ANDI Yogyakarta.

Utomo, A. M., Wijayanto, G. N., Yusfan, M. A., Wardani, P., Poniman, A., Supriyadi, A. A., Gultom, R. A., Martha, S., Purwantoro, S. A., Arief, S. (2021). Geospatian Intelligence Analysis to Support National Defense Interest. *International Conference on Advanced Computer Science and Information Systems (ICACSIS)*. doi: 10.1109/ICACSIS53237.2021.9631348

Verhagen, M.D. (2022). A Pragmatist's Guide to Using Prediction in the Social Sciences. *Socius, Vol. 8*, 1-17. https://doi.org/10.1177/23780231221081702

Yahya & Hakim. (2021). *KKB di Papua Dikategorikan sebagai Teroris, Pemerintah Minta Aparat Keamanan Bertindak Tegas*. Diakses pada 17 Juli 2024, dari https://nasional.kompas.com/read/2021/04/29/14312261/kkb-di-papua-dikategorikan-sebagai-teroris-pemerintah-minta-aparat-keamanan