THE READINESS OF INDONESIAN SPACE DEFENCE

Jeanne Francoise[1]
International Relations Study Program, Faculty of Humanities, President University[1]
Defence Expert for Republic of Indonesia's Defence Council (*Dewan Ketahanan Nasional*)[1]
mrfc.jen@gmail.com[1]

Santalia Leuwayan[2]
International Relations Study Program, Faculty of Humanities, President University[2]
santalia.leuwayan@student.president.ac.id[2]

Abstract
This academic paper is aimed to analyze how far is ASEAN member countries, as well as Indonesia to implement the ideas of space defence programmes. For analyzing the factor of current geopolitics, this paper is using the theory of neorealism, for analyzing the readiness of space defence, this paper is using Republic of Indonesia's national defense strategy, which includes inward looking and outward looking, then to analyze the implementation of the programmes of space defence, this paper is using dual use of civil defense. This paper will be the first eye opener about the importance and urgency of space defence as part of people's nationalism, identity, modernism, and economy.
Keywords: space defence, neorealism, ASEAN, Indonesia, nationalism, geopolitics

1. Introduction

In Indo Defence 2022, a very great event that was held by Republic of Indonesia's Ministry of Defence and organized by PT. Napindo, there were many forums that talks about the future of defence. In Indo Defence forum about "Space summit, entering the new era of aero and astro geopolitics: the nexus between security and development", the audience was so amazed by several ideas taken from the forum, namely the opportunities and challeges about space defence, the broader definition of "defense" itself, and how people from industry, as well as scholars and students could take part onto the new era of aero and astro-geopolitics.

The representative from Airbus explained in a powerpoint very detailed simulation of a new technology of space radar, that could be invisible and gives perspective in details about a basecamp or a house. This radar is part of Airbus programme to be part of how European Union embraces the idea of space defence. The programme of Airbus is in line with the programme of European Union, when we remember about the Capability Development Plan (CDP) approved by the European Defense Agency (EDA) Steering Board in 2014, these include cyber and maritime security, Intelligence, Surveillance and Reconnaissance (ISR), Remotely Piloted Aircraft Systems (RPAS), satellite communications including Governmental Satellite Communications (GOVSATCOM), and autonomous access to space and permanent Earth observation.

Another country that is ready for space defence programme is Japan. Quite different with how European Union countries will have collaboration between military and civilans for space defence, Japan's space activities were strictly limited to non-military, in total compliance with Article 9 of Constitution.

Therefore, the defense utilizations such as the Early Warning Satellite system had been prohibited for more than 3 decades (Otani, et al., 2012, p.1).

The country in which we can have deeper understanding about space defence itself is United States of America. The Department of Defense (DoD) is embarking on the most significant transformation in the history of the U.S. national security space program. Space is now a distinct warfighting domain, demanding enterprise-wide changes to policies, strategies, operations, investments, capabilities, and expertise for a new strategic environment. This strategy identifies how DoD will advance spacepower to enable the Department to compete, deter, and win in a complex security environment characterized by great power competition. Based on Defense Space Strategy Summary (2020), space defence for United States is totally for self-defense, not just developing industries or technologies. This can be analyzed by US perspective on China, Russia, North Korea, and Iran that US sees those countries as potential rival.

Space is vital to US security, prosperity, and scientific achievement. Space-based capabilities are integral to modern life in the United States and around the world and are an indispensable component of U.S. military power. Ensuring the availability of these capabilities is fundamental to establishing and maintaining military superiority across all domains and to advancing U.S. and global security and economic prosperity. Space, however, is not a sanctuary from attack and space systems are potential targets at all levels of conflict. In particular, China and Russia present the greatest strategic threat due to their development, testing, and deployment of counterspace capabilities and their associated military doctrine for employment in conflict extending to space. China and Russia each have weaponized space as a means to reduce U.S. and allied military effectiveness and challenge our freedom of operation in space (Defense Space Strategy Summary, 2020).

Rapid increases in commercial and international space activities worldwide add to the complexity of the space environment. Commercial space activities provide national and homeland security benefits with new technologies and services and create new economic opportunities in established and emerging markets. The same activities, however, also create challenges in protecting critical technology, ensuring operational security, and maintaining strategic advantages. Internationally, allies and partners also recognize the benefits of space for military operations, and increasingly understand the threats to those space activities. Allies and partners who are actively expanding their defense space programs, present novel opportunities to increase defense collaboration and cooperation (Defense Space Strategy Summary, 2020).

2. Research Methodology

This paper was prepared using qualitative methods. 'Qualitative methods' is a broad term that can be applied to a range of research approaches that have their theoretical origins in a range of disciplines including anthropology, sociology, philosophy, social psychology and linguistics (Moriarty, 2011, p.2). The sources used in this research were journals, magazines and research results from various institutions, both government agencies and independent institutions, which were obtained through the media and the internet.

The qualitative research method is considered the most appropriate methodology in carrying out research on the implementation of the programmes of space defence, and seeing its importance and urgency as a part of people's nationalism, identity, modernism and even economy. This requires deeper

analysis and has to deal with definitions, concepts and data analysis that should be described narratively.

3. Theoretical Framework

This paper is using qualitative method by using the theory of Neoralism to analyze the epistemology, ontology, and axiology of space defence and using the concept of "dual use" in civil defence to analyze the technology sharing in this digital era.

Neorealism

Neorealism developed from realism which argues that human beings are naturally egotistical and surrendered and thus it is impossible to cooperate with each other because the struggle for survival is carried out by mutual trade. This view of realism has developed since the 5th century, namely during the Peloponnesian war and then continued in the history of European nations who traded in order to defend national borders. Interests according to realists are aimed at increasing strength and also strength. Therefore, to achieve this, the realist focus is on military as well as economic power—material power.

Waltz then comes up with the thought that man and his true mind are the root of the conflict. But neorealists have maintained a renewed realist view—particularly of war—that states cannot escape the possibility of destruction. Cooperation is also a tool that neorealists do not fully see as the best means of survival. Neorealism or structural realism is a theory of international relations that emphasizes the role of power politics in international relations, sees competition and conflict as enduring features, and sees limited potential for cooperation (e-ir.info, 2018).

The neorealism-style international system structure emphasizes how the three layers of the international system—individuals, the state and society and the international—basically must own or be monitored by the international system so as to avoid competition that ends in war. The structure of international politics is sparsely defined by anarchy, which is the ordering principle of the realm, and by the distribution of capabilities across states (Waltz, 2004, p.2-6). This leads to how the international structure itself can be a cause of conflict or even end in war. In contrast to the view of realism which emphasizes the anarchic nature of states which in this case are governed by humans as their rulers.

Neorealism is subdivided into defensive and offensive neorealism. Offensive realism seeks power and influence to achieve security through domination and hegemony and Defensive neorealism points towards "structural modifiers", such as the security dilemma and geography, and elite beliefs and perceptions to explain the outbreak of conflict (e-ir.info, 2018).
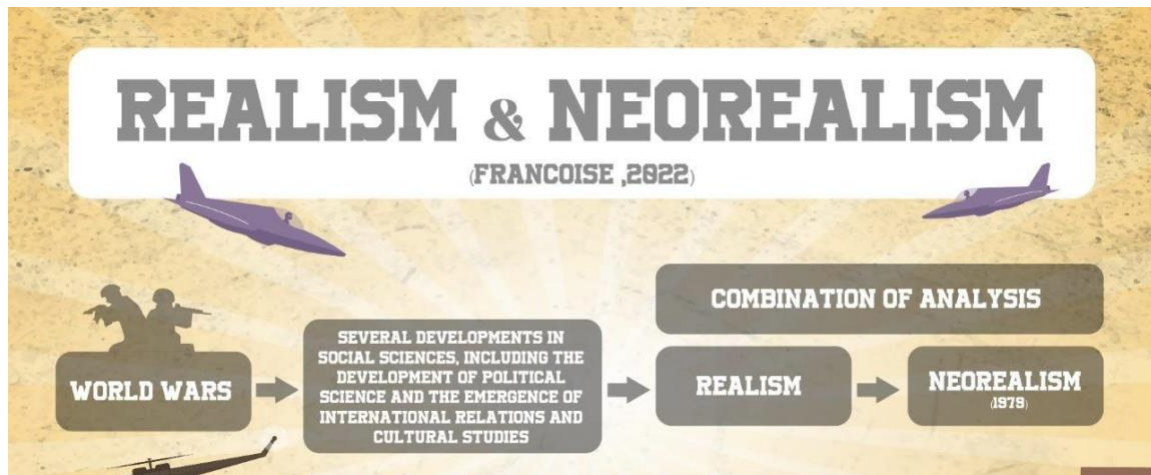
Figure 1. The historiography of Realism and Neorealism (Francoise, 2022)

Based on historiography summary from Dr. Jeanne Francoise, a lecturer of International Relations and expert of Defense Heritage (2022), that in international relations, the idea of Realism was coming first, then after World Wars, Neorealism was the academic fruit of very deep thought from scholars who sent to war. In the war zone, they could not use "their book", but forced to have "to kill and to be killed situation", so when they were successfully coming back to campus, they changed so many perspectives in international relations thoughts. Even after World Wars, there were many studies appeared in Social Sciences in general, such as Neorealism theory, Nationalism theory, Peace & Conflict Resolution studies, and Cultural studies.

Realism believes that conflicts arise because states are self-interested and power seeking units as they are made of people who are self-interested and unchanging, while neo-realism believes that conflicts arise because of anarchy. Since there is no central authority, the states try to seek power to help themselves. While Realism is only talking about State Behavior, Power, and Strength, Neorealism focus on international events, not the international distribution of power (e-ir.info, 2018).

Dual use concept in civil defense
In general, "dual use" means that the device or the system has been designed for or used by more than two actors. In this paper, Dual-Use implies that the device or the system has been designed for or used by national security users and civil users (Otani, et al., 2012, p.2).

Based on field observation of Dr. Jeanne Francoise, the country that is using dual use concept for civil defense in the readiness of space defence is the United States of America. USA is using dual use for space defence because of several reasons, such as in the federal government system of USA, the defence is put as part of the affairs of public politicians, not just under military officials. Both in peace and conflict time, national defence is under civilian political rights, so that military officials tend to learn about civilian rights, human rights, Geneva Convention, and other useful things.

Other factor is because the dynamic of technology business in the USA. At the end of 2021, there were at least 585,000 technology companies in the United States. According to data taken from Zippia, at the end of 2021, the tech industry in America reached a market value of $1.6 trillion, with 35% of the world market share. The number of workers in the United States technologist sector reaches

around 5.2 million workers in 2020 (Statista, 2021) where Florida is recorded as the U.S. state with the highest number of new technology business establishments, which explain furthermore that the tech business is not just coming from Silicon Valley, but also involving so many civilians, as well as third partners, that could be civilian foreigners.

The third factor is about the development ideas in the guidelines on USA defense white papers. US Department of Defense (DoD) is developing the definition of defense itself, as well as new ideas for the sake of American people. The developing ideas are about the space defence, new radar system, Mars occupation, and DoD releases path to cybersecurity through zero trust architecture (https://www.defense.gov/, 2022). To implement those ideas, DoD cannot work alone, but working with other stakeholders, especially technology industries.

4. Analysis

Meanwhile the other countries are getting ready on space defence, Indonesia is too focus on preparation the G20 event. In fact, G20 is giving us so much ideas on how we can improve our countries, including defense factor. In the Introduction, we can see that Indo Defence event is one of the effort to make publicity of local defense industries and technologies. In Indo Defence Forum of Space Summit, there is still no firm statement from Indonesian Ministry of Defence whether Indonesia is ready or not for space defence programme. The speaker representative from Indonesian Army only explained about history of the rocket Kartika-1 launched by Indonesian Air Force (TNI AU) in 1964, then Indonesian Space Law.

In fact, every country will always be faced with challenges, especially the defense systems of countries that are located in close proximity to countries that are vulnerable or temporarily in conflict. So that threats will appear not only domestically but regionally and even globally. Apart from that, another urgency lies in limiting the domination of big countries—namely by having a defense system that is "sensitive" to trends. Likewise, Australia, which builds its defense system by considering relatively similar problems with Britain, especially concerns the development of US foreign policy and China, world order based on international laws, acts of terrorism to cyber and space threats (Larosa, 2017, p.264)

The Indonesian representative said that the launch of rocket Kartika-1 in 1964 proved that Air Force and national agencies have paved the way, consolidated, and created the foundation of space exploration. The Indonesian representative also explained that in Indonesian Space Law, the implementation of space has to be inclusive as the supporting component of the defense and integrity of Indonesia.

The launch of rocket Kartika-1 in 1964, yes this is a proof that Indonesia was already doing the very good civil-military relations or in this paper is dual-use concept, but we never know about the maintenance after that launch or the progress to do updated rocket. The academic reference about this launch is also limited, perhaps the launch was regarded as the branding of rocket programme implementation, not the main project. It means that at that time, Indonesia didn't have yet the blueprint of space defence.

The launch of rocket could not be seen as the measure for space defence preparation, because as we can learn from US defense doctrine, the most important thing is how the nation looking to themselves, the technology comes after. Here after 1964 rocket launch, Indonesia was having trouble of internal

politics, New Order giving us so much problems in social, political, and economic life, so that defense, especially military was only used as tool of politic, not the legitimate institution to implement civilian rights. Even during New Order time, trust on military officials were decreasing dramatically, in respect to the period of Indonesian defense heritage, while we knew that first military soldiers, together with civilians, were well cooperating to end Dutch military aggression, that had happened after independence.

Figure 2. Presentation moment in Indo Defence: Space Summit (Francoise, 2022)

In the context of Indonesian space law, there are so many things to be discussed. The first thing is about the definition of space defence for Indonesian nation-state building. Then how to make more clearer the classification of space defence in the time of peace and in the time of conflict. Because we are adapting Trias Politica, it is better to have civilians politicians perspective on this context, so we can conclude the space use for the sake of whole Indonesian people, not just military officials or rich people.

By remembering what have been said by Indonesian military official representative in Indo Defence Forum: Space Summit, that in Indonesian Space Law, the implementation of space has to be inclusive as the supporting component of the defense and integrity of Indonesia. The word "inclusiveness" here must be described accordingly. We already so many slogans and logo about many things, for example *"Saya Indonesia, saya Pancasila"*, *"Bhinneka Tunggal Ika"*, or *"Berani Jujur Hebat"*, but still Indonesia facing socio-problems, namely intolerance, corruption, material generation, cases of sexual violences, and social injustice. Just the same with that worry, we would have a very strong and firm Indonesian Space Law, that not just political branding, but the real strategy blueprint for Modern Indonesia in Golden Generation 2030-2045.

In line with Neorealism theory, that we can develop the deeper thoughts about the relation between civilians and military, here are 3 (three) several recommendations to be put clearly in the Indonesian Space Law:

1. <u>Definition of Space Defence for Indonesian integrity</u>

This part will be the very big role for Indonesian Defence Council (Dewan Ketahanan Nasional RI / Wantannas) to gather stakeholders from military officials especially Army Commander, academia, technology industries, and government officials especially Ministry of Defense, to discuss once more about the Indonesian defense doctrine. As stated on Introduction, that every programme of space defence in developed countries, have strong foundation of philosophy thought, not just direct implementation. By developing Indonesian defense doctrine, we can develop military doctrine, then we must state clearly where is Republic of Indonesia's position in space defence, just watching or taking part.

Learning from many countries that already tried the defense doctrine to be embedded in their citizens effectively, pop culture is the answer. So this is the time that Ministry of Defense can involve artists to infiltrate the defense doctrine in daily pop culture, for example in comics, films, novels, etc, so that Indonesian people understand that Indonesian space defence is also part of civilian rights.

2. <u>Classification of Space Defence in Indonesian White Defense Paper</u>

After having discussion in Wantannas, it is time Wantannas to convince the central government to support regular research and innovation in space defence, that can be initiated by Indonesian Space Agency (INASA) BRIN, as well as involving civilian experts in defense policy-making to do reassuring the Ministry of Finance and People's Legislatives (DPR) about the urgency and importance of space defence readiness. Remember, our current national budget can be used only for peace time, not for conflict time. Once we have conflict time, no strategy has been devised to get through it.

The collaborative research of course to make classification of space defence in Indonesian white defence paper. On our 2015 white defence paper, we still divided the times into 4 (four) times, namely peace time, conflict time, civil emergency, and martial law. For each time, of course we have to know what we can do for space defence readiness. We can start in peace time, space defence programmes focus on technology development, stakeholders monitoring, and infrastructure building. In the conflict time, civil emergency, and martial law, must be well thought what roles that changing or any materials can be used to prevent bigger conflict. Here we still adapt the quote "si vis pacem, para bellum".

In addition, based on explanation in Indo Defence Forum: Space Summit, Indonesia also needs SoC (System of Chip) to face the security for future advance technology and Orbital Edge Technology (OET). For SoC, Indonesia must learn about Quantum Warfare, Space Based Data Center, and Collaborative Traffic Automation. For OET, Indonesia must learn about Real-Time AI based Radar Services and Climate Service (Indo Defence, 2022).

3. <u>ASEAN Geopolitic</u>

In line with Neorealism theory, space defence can be regarded as the new measurement on how inter-states doing modern diplomacy, that includes transfer knowledge about space technology, but still respecting other country's integrity. In this connection, every nation strives to achieve and secure its national interests using all instruments of national power at its disposal (Manihuruk, 2020, p.132-142). Remember, Indonesia is the biggest country in ASEAN, but in ASEAN we implement non-interference policy, so that while doing

space defence preparation, Indonesia can have internal policy to do security clearance for all stakeholders, including technology industries, civilian entreprises, and clients as provider of space facilities, to make sure that all stakeholders will respect Indonesian national integrity. For geopolitics context, Indonesia must ensure all stakeholders that involved in space defence programme, must avoid discussion of the Indonesian space defence process in public seminar, to reduce information leakage.

5. Conclusion

The enthusiasm to discuss space defense studies began in 2015 when I first visited the Indonesian Air Force's top official who said that Indonesia is still learning many things in defense. This certainly triggers me to be able to find out more deeply whether Indonesia is ready for the space defense program which is the mainstay of defense for developed countries in the next 50 years.

I also became a participant in the Indo Defense Forum: Space Summit to have better understanding about the perspectives of developed countries in preparing space defense programmes. Space defense can not only be measured from rockets or radar, but from the development of a more modern and advanced philosophy of defense doctrine, especially understanding the context of human position in the field of space defense. Therefore, this paper has a novelty to discuss Indonesian space defense with academics and is intended to be a reference for Indonesian Defense Council (Wantannas RI), which will carry out collaborative meetings of all stakeholders more seriously.

References
Books
Republic of Indonesia's Ministry of Defense. 2022. Indo Defence Forum: "Space summit, entering the new era of aero and astro geopolitics: the nexus between security and development". Jakarta: Kemhan RI.

Journal Articles
Manihuruk, H. (2020). Strengthening the State Defense System of the Republic of Indonesia through Implementation of the State Defense Policy. *Natapraja*, *8*(2), 132-142. https://ojs.unud.ac.id/index.php/UJoSSH/article/download/73364/39638
Larosa, T. (2017). The Future Defense System for the Indonesian Nation State. *Jurnal Pertahanan: Media Informasi ttg Kajian & Strategi Pertahanan yang Mengedepankan Identity, Nasionalism & Integrity*, *3*(3), 261-280. http://jurnal.idu.ac.id/index.php/DefenseJournal/article/view/237

Webpages
Statista. (2021, May 27). *Tech sector employment in the U.S. 2020-2030, by occupation*. https://www.statista.com/statistics/674463/united-states-electronic-components-manufacturing/
Waltz, K. (2004). Neorealism: Confusions and criticisms. *Journal of Politics and Society*, *15*(1), 2-6. https://ir101.co.uk/wp-content/uploads/2018/11/Waltz-Neorealism-Confusions-and-Criticisms.pdf
https://www.airbus.com/en/products-services/space
https://www.airforce.gov.au/about-us/defence-space-command
https://committees.parliament.uk/work/1264/space-defence/
https://eda.europa.eu/what-we-do/capability-development/space

https://issuu.com/apsm/docs/australian_space_magazine_issue_3_final_single
https://media.defense.gov/2020/Jun/17/2002317391/-1/-1/1/2020_DEFENSE_SPACE_STRATEGY_SUMMARY.PDF
https://robertsspaceindustries.com/orgs/GDFO
https://spaceanddefense.io/