

**Analysis of the Position of the Tactical Vehicle Defense Industry on the National Defense Development in a Logistics Perspective**



**Analisis Posisi Industri Pertahanan Kendaraan Taktis Terhadap Pembangunan Pertahanan Negara Dalam Perspektif Logistik**


Dave M.H Lomboan<sup>1</sup>

<sup>1</sup> Sekolah Staf dan Komando Angkatan Laut,

<sup>1</sup> Komplek Seskoal, Cipulir, Kebayoran Lama, Jakarta Selatan, Indonesia

Davelomboan52@gmail.com<sup>1\*</sup>

Corresponding Author: Davelomboan52@gmail.com<sup>1\*</sup>

ARTICLE INFORMATION	
<p><b>Keywords</b>  <i>Defense Industry;</i>  <i>Tactical Vehicle;</i>  <i>Defense;</i>  <i>Logistic;</i></p>	<p><b>ABSTRACT</b>  <i>The defense industry is part of the pillars of empowering the state's defense posture, especially in times of peace. Tactical vehicles are part of the defense industry which is an industry downstream. In this research, we analyzed the position of the tactical vehicle industry on the part of national defense empowerment. The concept of national defense explains the defense and threat spectrum. The logistics concept provides a framework analysis of the national defense empowerment and military operations. The first analysis is the industry of tactical vehicles in legal aspect is part of national defense posture. On strategic logistic levels, this industry plays a role in meeting the needs of national defense empowerment requirements in tactical vehicles. The last, tactical logistics levels play the role as the main or support power in the military operations of TNI.</i></p>
<p><b>Kata Kunci</b>                      Industri pertahanan;                      kendaraan taktis;                      pertahanan;                      logistik;</p>	<p><b>ABSTRAK</b>                      Industri pertahanan merupakan bagian dari pilar pembangunan postur pertahanan negara terutama dalam masa damai. Industri pertahanan merupakan industri hilir yang terbagi dalam beberapa sektor salah satunya pada produk kendaraan taktis. Penelitian ini menganalisis posisi industri pertahanan kendaraan taktis terhadap pembangunan pertahanan negara dalam perspektif logistik. Penelitian ini menggunakan konsep pertahanan negara dalam penjelasan terhadap pertahanan dan spektrum ancaman. Konsep logistik memberikan analisis terhadap pembangunan kekuatan pertahanan dan pengerahan kekuatan pertahanan. Penelitian ini menjelaskan bahwa industri pertahanan kendaraan taktis secara undang-undang dan peraturan merupakan bagian dari pembinaan postur pertahanan. Industri kendaraan taktis pada tingkatan strategic logistic berperan dalam pemenuhan kebutuhan alat pertahanan dan keamanan. pada tingkat tactical logisitic, produk industri kendaraan taktis berperan dalam operasi militer oleh TNI.</p>
<p><b>Article History</b>                      Send 28<sup>th</sup> March 2022                      Review 18<sup>th</sup> April 2022                      Accepted 30<sup>th</sup> May 2022</p>	<p>Copyright ©2022 <i>Jurnal Aristo (Social, Politic, Humaniora)</i>                      This is an open access article under the <a href="#">CC-BY-NC-SA</a> license.                      Akses artikel terbuka dengan model <a href="#">CC-BY-NC-SA</a> sebagai lisensinya.</p> 

## Introduction

State Defense in Statute Number 3 of 2002 states that the implementation of national defense is being run by building and developing the nation's and state's capabilities and deterrence against threats. The development of a national defense posture is intended to implement national defense to build national deterrence against various forms of threats. National Defense is built based on the Law by building three pillars, namely professionalism, national economic strength, and the strength of the defense industry (Ministry of Defense Regulation Number 19 of 2012 Alignment Policy of the Main Component Minimum Essential Force, 2012). The manifestation of the National Defense Law in the implementation of national defense is the development of a medium-term defense posture in the Minimum Essential Force (MEF). MEF development planning includes the development of national strength in the professionalism and capability of personnel, modernization, and fulfillment of the main tools and support for national defense that are supported in achieving national industrial independence.

The national defense industry has an important role in developing the national defense posture. The defense industry not only plays a role as a builder of strength postures but also plays a role as part of a sustainable system of defense itself. The defense industry is an important part of the supply chain/logistics in the national defense system (Rusdiana et al., 2021). *Logistics* in the military context can explain as the resources needed to maintain the "means" of a military process/operation to achieve the desired outputs (outputs/objectives) (Kress, 2016). In terms of logistics, it is a "means" in the strategic part of military operations, defense equipment, weapons, troops, food, ammunition, and others. This definition states that the defense industry is a form of input from the process and provision of military logistics resources. The defense industry's role as military logistics is part of military supply chain management in realizing procurement, supply, maintenance, revitalization, and distribution (Rusdiana et al., 2021).

Indonesia's commitment to increasing the capability of the independent defense industry is one of the goals of developing a robust national defense posture. The main view on the defense industry's development is stipulated in statute No. 16 of 2012 regarding the defense industry. The development of the defense industry cannot be separated from the military's need to build its strength. The Defense Industry Policy Committee (KKIP) is an institution formed by the government as a bridge between the strategic industry and the military and designing the direction of defense industry policy (Fitri & Sanur, 2019). The development of the defense industry is also inseparable from the history of the military embargo experienced by Indonesia

and the proof of Indonesia's dependence on defense equipment from abroad (Rusdiana et al., 2021).

The Indonesian defense industry can be divided into five main sectors: essential industry, component industry, downstream/final industry, personal and supporting equipment, and electronics and control (KKIP, 2018). The capability to fulfill domestic defense equipment products has limitations, especially in high-tech manufacturing. These conditions are attached to the fact that the Indonesian defense industry still has limited capabilities in the human resource sector, mastery of defense technology, finance in supporting the defense industry or development programs, and other limitations (Montratama, 2018).

This research explicitly places the focus of the analysis on the analysis of the defense industry on tactical vehicles. Domestic tactical vehicle products (Rantis) are one of the priorities to meet the needs of the TNI. Fulfilling the need for tactical vehicles from domestic manufacturers is a step toward reviving and growing the national defense industry (Diamanty Meiliana, 2020). Although Indonesia is still not separated from the need for defense equipment from other countries in several sectors. Tactical vehicles (Rantis) are a defense tool that is a land unit and is one of Indonesia's downstream industry products in the defense industry sector. Several national strategic industrial companies. In addition to domestic fulfillment, tactical vehicles produced by Indonesia are one of the primary defense equipment export products. In 2019, the nominal export of tactical vehicles reached UD\$ 1.1 billion, with an average annual growth of 62% from 2010 to 2018 (Viva Budy Kusandar, 2019). The export capability of the domestic defense industry is an indicator of production capability and independence in the tactical vehicle industry sector.

The potential of Indonesia's tactical vehicle industry is growing, involving the government-owned industrial sector and private industry. Under the Defence Act of 2002, private companies have rights in the defense industry in addition to combat equipment or essential means of defense. However, there is a change in the Omnibus Law 2020, which provides private companies the opportunity to develop the national defense industry in the defense primary equipment industry. This regulation of the Law becomes an important analysis point to see the potential development of the tactical vehicle defense industry and the role of private companies in its development.

This study analyzes the role of the tactical vehicle defense industry in the national defense industry and national defense on two levels, namely strategic and operational levels. These two levels are specifically studied from the perspective of military logistics, which places the tactical vehicle industry in two analytical points of view in the position of the military

logistics chain. Conceptually, domestically produced tactical vehicles are part of the national military logistics chain that can be categorized as "means" in military operations. Based on the above conditions, this study proposes a research formulation "what is the position of the tactical vehicle defense industry as part of the development of the national defense posture?". This study aims to analyze and assess the position of the national defense industry towards the need for national defense and security tools from a logistical perspective.

## **Method**

This research is qualitative research that takes an approach to understanding a phenomenon (Cresswell, 2013). This research is a literature study where the analysis is carried out on data sourced from literature in the form of books, news, laws, government regulations, articles, and journals available physically or from virtual media. The object of analysis in this study is the tactical vehicle defense industry in its position as part of the national defense system. The definition of *position* in the research is the understanding and legal position of the defense industry, which is studied from the perspective of military logistics analysis. The concept of military logistics from this research is part of the study of military strategy in the concept of national defense.

The qualitative research can be verified and validated through credibility, dependability, transferability, and confirmability tests (Sugiyono, 2010). This research is a literature study with the primary data sources in the form of official documents, statute, official statements, books, and articles that have proven credibility of their sources and through triangulation of research sources through researcher analysis to obtain conclusions. One of the ways to check the credibility of research is to ensure the adequacy of references and sources of research data (Burhan, 2007). This research ensures the availability and adequacy of verified and credible sources as a literature study. Testing the validity of this study triangulated the data sources by comparing several sources and analyzing the suitability of these data sources. This study places triangulation with theory by organizing the data findings with the pattern of the theory used and presenting methodological data analysis.

## **Results and Discussion**

### **National Defense Industry of Tactical Vehicle on State Defense**

Indonesia's defense posture building aims to increase the country's defense capability. Implement a self-defense system by mobilizing all national resources to support defense from threats. The national resources or power resources support national defense, which transforms

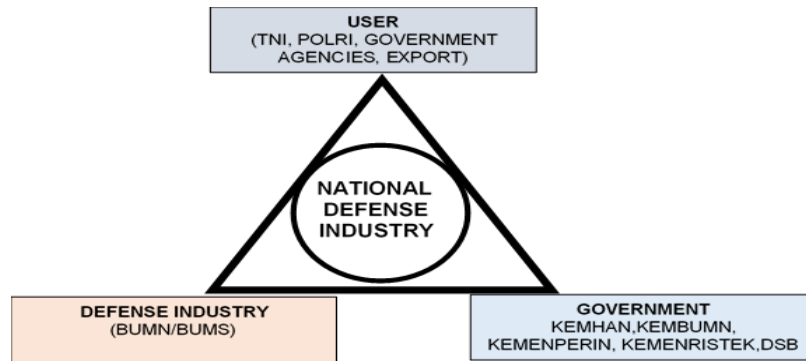
the resources into a national power. National resources in supporting the national defense posture can be sources of state ideology, politics, economy, socio-culture, military (TNI), geographical conditions, demography, and natural resources (Kementerian Pertahanan RI, 2014).

In practice, the national defense industry supports the national defense system enforcement. In Statute No.3 of 2002 in Article 20, paragraph 2 states that the position of the defense industry as a part of fostering national defense. This paragraph mentioned that "All national resources in the form of human resources, natural and artificial resources, values, technology, and funds can be utilized to improve the national defense capability further regulated by government regulations."(Undang-Undang Nomor 3 Tahun 2002 Tentang Pertahanan Negara, 2002). In article 23, the resources referred to above are described in the form of technology development and defense industry to increase the national defense power. Statute No. 3 of 2002 has provided a legal basis where the defense industry is part of developing the national defense force, which is also included as part of one of the national resources.

In Statute No.16 of 2012, Defense Industry defines is a industry consisting of state-owned enterprises and privately-owned enterprises and plans set by the government to partially or wholly produce equipment for defense and security. This business area included the maintenance services to meet the interests of defense and security strategies located in the territory of the Unitary State of the Republic of Indonesia (Undang-Undang Nomor 16 Tahun 2012 "Tentang Industri Pertahanan," 2012)". In this definition, the defense industry can be from companies or private companies engaged in defense production and services. However, there is no difference in the industrial sector between state and private companies, where private companies do not need to use the primary state defense tool. A sector distinguishes between companies and the private sector in industrial defense, namely in the production of the leading state defense equipment fully authorized by State-Owned Enterprises (BUMN). Statute No. 16 explains that there are four defense industry sectors: the primary equipment industry, the principal and supporting component industry, the principal and supporting (supplies) component industry, and the raw material industry. In addition to the main tools, the private sector can operate in the other three areas of the defense industry.

Institutions in the administration of the defense industry include three pillars, namely users of defense equipment, the government, and the defense industry. In practice, the government establishes and appoints the Defense Industry Policy Committee (KKIP) as the coordinator of national policies in the defense industry's planning, formulation,

implementation, control, synchronization, and implementation (Kementerian Pertahanan, 2015).



**Figure 1 The Concept of the Three Pillars of the Defense Industry**  
 Source: Buku Putih Pertahanan Indonesia, 2015

The defense industry is not only focused on meeting the needs of the TNI in military operations. This industry also provides for the needs of civil security guards or in carrying out the duties of other state institutions. The defense industry for tactical vehicle products is one sector that produces both for defense, security, and humanitarian missions. This industrial sector does not only meet the need for combat vehicles within the scope of the leading defense equipment but also supports vehicles for logistics, ambulances, anti-riots, transport vehicles, and others. In Indonesia, several companies are engaged in producing tactical vehicles, both BUMN, and BUMS.

**Table 1 Tactical Vehicle National Company and Product**

<b>Company</b>	<b>BUMN/BUMS</b>	<b>Product</b>	<b>Function</b>
PT. Pindad Persero	BUMN	Komodo 4x4	Personnel transport tactical vehicle (modified type)
		Anoa 6x6	Personnel transport tactical vehicle (modified type)
		Anoa 6x6 Amfibi	Personnel transport tactical vehicle
		Badak 6x6	Fire support vehicle
		SANCA – Anti ranjau	Anti-Mine Tactital Vehichle
		Harimau Medium Tank	Combat vehicle
		PWC25 - watercanon	Anti-riot vehicle
PT Indopulley Perkasa	BUMS	Boogie wheel dan suku cadang berbasis metal dan karet	Spare-part supplier for military vehicle

PT Jala Belikat Nusantara Perkasa (JBLN)	BUMS	Indonesia Light Strike Vehicle (ILSV)	Personnel transport tactical vehicle (modified type)
PT Karya Tugas Anda	BUMS	Kendaraan Dapur Lapangan Turangga APC 4x4 Mobile Field Hospital	Logistic Support Personnel transport tactical vehicle Health support vehicle
PT Merpati Wahana Raya	BUMS	Truk Dekontaminasi  Invander – Truk Jihandak Ganilla- Truk dapur lapangan Stallion	Special vehicle for radiation, chemical and biological decontamination operations Special vehicle for explosive disposal operations Logistic Support Quick reaction special vehicle for decontamination
PT Sentra Surya Ekajaya	BUMS	P3 Ransus P6 ATAV P2 APC dan P2 Commando	Light Strike Vehicle Light Strike Vehicle Armored tactical vehicle

Source: KKIP, 2018

Some tactical vehicles have several types modified according to their function and designation. Like the vehicles made by PT Pindad, the Anoa 6x6 with several types, such as the Anoa 6x6 Command transport vehicle, the Anoa 6x6 Mortar equipped with a mortar launcher, the Anoa 6x6 logistics as a support and transport vehicle, or the Anoa 6x6 ambulance as a medical vehicle (KKIP, 2018). Based on some of the data above, it can be explained that the land defense industry can provide the needs for the central defense equipment, the leading supporting equipment, and supporting operations. This need is not only addressed to elements of the military but also to elements of civil security or other institutions that function in the security, rescue, and humanitarian assistance sectors.

Based on the legal aspects in the laws and regulations and government regulations, the tactical vehicle industry is part of the pillars of national defense development. This industry provides the main tools and support for defense by BUMN or BUMS following applicable laws and regulations. The defense industry is part of the national power in managing resources to realize defense tools and forces both in the military and non-military sectors.

### **Tactical Vehicle Defense Industry in Strategic level Logistic Analysis**

Jomini defines *logistics* as an art (art) in troop movement, which consists of a series or detailed sequence in the movement and camp, placement and supply of troops, which is the



execution of strategy and tactics (Kress, 2016). Kress divides logistics analysis into three levels: strategic logistics, Operational Logistics, and tactical Logistics. These three levels are not separate forms but a form of a hierarchical relationship in an organization with levels of tasks and functions (Kress, 2016). The strategic level of logistics is analogous to the highest level in the organization. In this context is the level of policymakers or strategists or decisions related to defense in the long term. In this context, the strategic level can be interpreted as policymakers, be it the government or the top hierarchy in military organizations. Stakeholders at this level have the authority to make research and development investment decisions, procurement, and additions to decisions related to physical infrastructure development (Kress, 2016).

The national defense policy places the development of the national defense industry to support the defense system. This form of policy is the basis of the national defense system for countries with advanced defense capabilities. China has become one of the countries that have succeeded in reforming the national defense industry through increasing investment and increasing research and development of defense technology China's defense technology development has a pattern of technological imitation and local development (Bitzinger, 2016; Durmaz, 2016). The policy of acquisition and modification of technology is also applied by several countries, such as Iran, to develop technology in the defense industry sector or in developing technology for the public interest (Czulda, 2020).

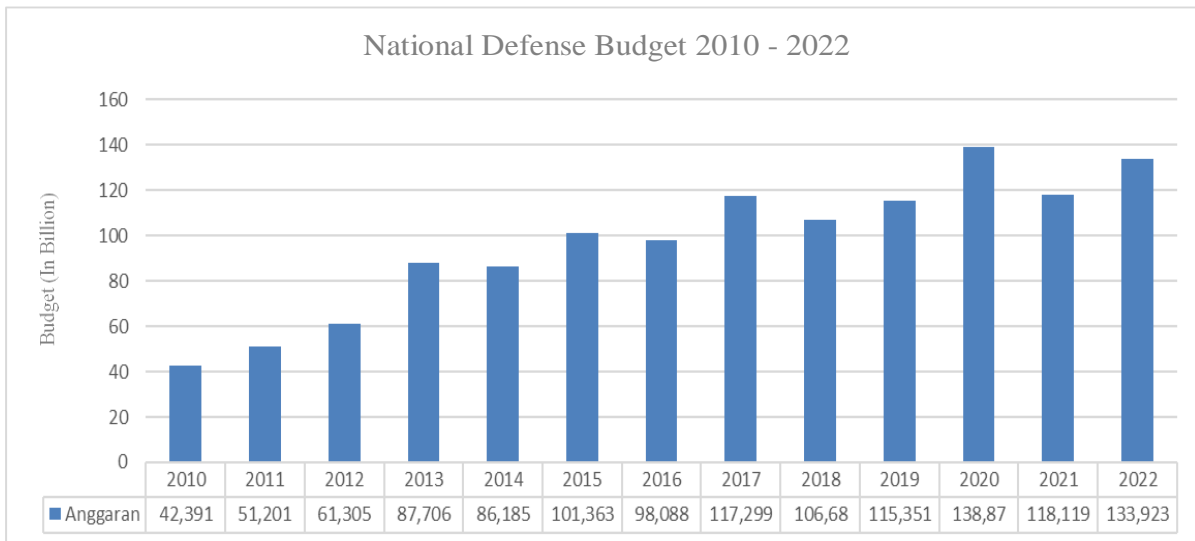
Revolution in Military Affairs (RMA) has developed rapidly since the cold war, which has encouraged the development of technology and arms races, especially in developed countries (Shiddiqy et al., 2019). The United States, Britain, Germany, the Soviet Union (currently Russia), and other developed countries encourage the development of national industrial technology as the primary source in fulfilling their defense logistics (Susdarwono, 2021; Yoho et al., 2013). This policy places the state as the first consumer of its national defense industry products before entering the current global market (Heidenkamp et al., 2013). The political constellation and competition between countries encourage these developed countries to secure supply chains from defense logistics that are centralized within the country (van Strien et al., 2019). In this position, the national defense industry is part of the national power which is part of the posture and defense system itself.

In fulfilling the strength of its defense posture, Indonesia places the development and independence of the defense and security industry as posture-building goals. The development plan prepared in this MEF places the improvement and development of effective, efficient, and productive production capabilities to achieve self-reliance. The 2020 Omnibus Law changes



the exclusivity of the leading defense equipment industry held by SOEs by involving BUMS in this sector. Article 74 of the Omnibus Law states that The primary instrument industry for state defense is no longer exclusive to a state-owned company. A private-owned company can be part of the defense industry, and the government continues to act as a lead integrator (Fitri, 2020). The role of the private sector has had a positive impact in accelerating the development of the defense industry, such as in South Korea through Daewoo and Samsung. The global defense industry market is also 70%-80% still dominated by private companies from the United States and European countries (Kleczka et al., 2020; Kurç & Neuman, 2017).

Industrial conglomerates can become one of the pillars in providing development and operational funds for this industry. The limited state budget in the defense sector is one of the obstacles to the development of technology and the defense industry in general and fundamentally (Skogstad, 2016). State spending comes from the state budget, which has a limited allocation for its use. In the MEF implementation phase for the 2010-2021 period, the defense budget gets an average allocation of 0.8% of the total national budget.



**Figure 2 National Defense Budget 2010 - 2022**  
Source: (Fitri, 2021; Kusnandar, 2021)

However, there have been ups and downs in terms of nominal defense budgets, with an average growth of 15% per year. This growth is an indicator of the actualization of the MEF implementation on defense system building. The defense budget is also allocated to several sectors, with an average budget for defense equipment of 30%-35% for three-dimensional defense and other supporting tools (Viva Budy Kusnandar, 2021).

The growth in budget allocations for modernization and revitalization of defense equipment is not directly an indicator of the absorption of national defense industry products, especially private companies. In the 2021 State Defense Policy, the main point on modernization of defense equipment by the main tools of the defense system and combat support. Based on this condition, the absorption of defense industry products from abroad is a priority choice in meeting the need for defense equipment with high technology. Rationally, the current limited capacity of the domestic industry is still unable to meet the government's need for defense equipment fully. The portion of the defense budget for research and development activities for defense technology is still very minimal. The insufficiency of research and development is a barrier for Indonesia in catching up with faster technological growth.

In the 2021 national budget, the budget for research, industry, and higher education programs for defense gets an allocation of 0.412% or IDR 486 billion of the total defense budget. This value decreased in the 2022 defense budget to 0.24% or 333.4 billion Rupiah of the total 2022 budget (Fitri, 2021). The budget allocation for development decreased by 31.8% and is inversely proportional to the increase in the defense budget by 13% from 2021. The decline in the budget for research, industry, and higher education for defense indicates the government's lack of seriousness in developing and accelerating the growth of the national defense industry.

Although private companies can inject funds to accelerate industrial growth, there are still fundamental differences in business objectives between the private and government sectors. The market potential of the Indonesian defense industry and the projected profit (profit-oriented) from this industry cannot be separated from their business considerations. The defense industry market is still dominated by European companies and the United States, Russia, and China. The arms export market of European countries has a percentage of 86% of the non-European market and 14% of market fulfillment in the region (Kleczka et al., 2020). The European market area has strict rules in meeting the needs of weapons. Defense industry for land and sea dimensions, European countries have a mature and robust industry (Bishop & Williams, 1997; Fonfría & Duch-Brown, 2014). Compliance for the air dimension has complex regulations currently only fulfilled by industry players from America and the European region themselves (Heidenkamp et al., 2013; Kleczka et al., 2020).

The European market can be a closed and exclusive market for developed countries, and reaching the European market or the United States is still tough to fulfill for Indonesia. The emergence of emerging powers in the defense industry such as South Korea, Brazil,

Turkey, Ukraine, and India has transformed the number of market players in this industry. These countries are considered as countries that are middle advanced in technology development in the defense industry and have become one of the producers for markets in developing countries (Kurç & Neuman, 2017). Meanwhile, Indonesia's position is still assessed as a country with specifications with specific industrial capabilities. It cannot yet be categorized as a country with advanced technological capabilities to compete globally.

Indonesia's domestic market, especially for the fulfillment of combat and tactical vehicles, is still dominated by foreign industrial products. Like the fulfillment of battle tanks for the TNI from several countries, not only domestic products. Meanwhile, domestic companies capable of manufacturing this industry are still limited. Based on data from global firepower, the number of ownership of Indonesian battle tanks is 314 units, and armored vehicles are 1,444 units (Global Fire Power, 2022). Among them are tanks produced by the TNI's domestic and foreign defense industries.

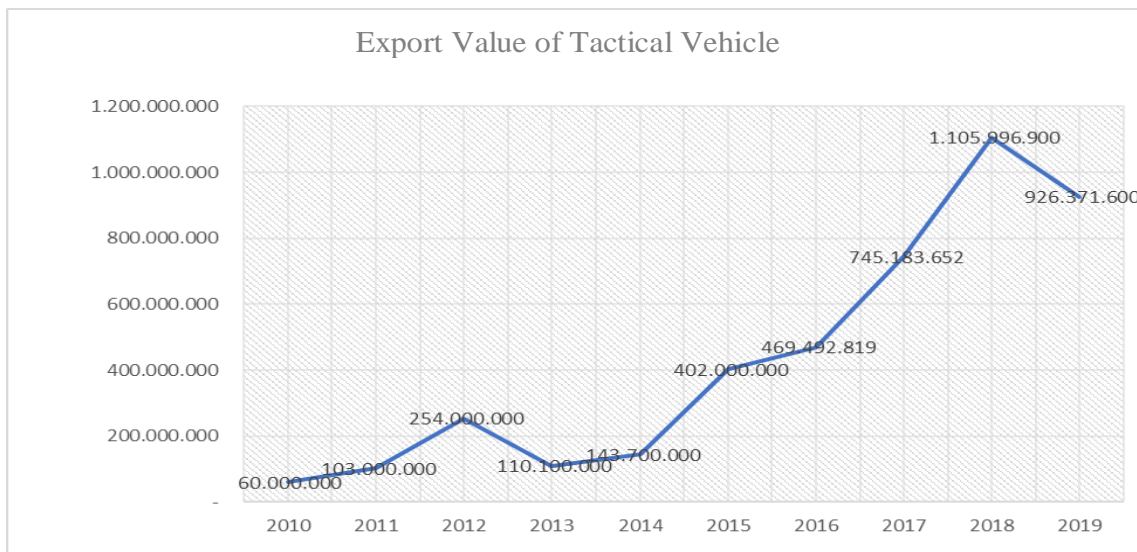
**Table 2 Manufacturer of Battle Tank Vehicles Owned by the TNI**

<b>TYPE</b>	<b>PRODUCER</b>
Alvis Scorpion 90 Light Tank	Inggris
Kmw Leopard 2A4 MTB	Jerman
Kmw Leopard 2RI MTB	Jerman
Pindad Harimau 105 MT	Indonesia
Doosan Tarantula 90	Korea
Pindad Badak 90	Indonesia
Tank Marder	Jerman
Tank Amfibi Arisgator	Modification of Tank angkut M-113, produce by Applicazioni Rielaborazioni Impianti Speciali - Italia
TANK BMP-3F	Join Development Indonesia - Rusia

Source: Vinta 2020

Indonesia has PT Pindad, which is capable of producing and developing combat vehicles. However, in some conditions, purchasing defense equipment is still unavoidable, especially in meeting the needs related to technology and tactical capabilities. One of which is combat vehicles; purchasing the main defense equipment can be classified into two points: pure

purchases in meeting needs and purchases in terms of cooperation and joint development needs, either in joint development or technology transfer. The joint development cooperation for the main defense tool has been carried out by Indonesia, one of which is with emerging power countries in this sector. As is the case, the Indonesia-Turkey cooperation has a Modern Medium Weight Tank (MMWT) or Kaplan Tank development project (Luerdi & Marisa, 2019). This collaboration places PT Pindad as a leading actor in implementing cooperation, especially in the development and process of technology transfer. In similar collaborations, the Government places BUMN as the leading sector in the defense industry, especially in the main defense tool. The existence of private companies still places itself in the supporting equipment industry and the light tactical vehicle industry (see Table 1). The national light tactical vehicle industry is one of the main suppliers for the fulfillment of national defense and security institutions. The development of this industrial sector shows a good pace of development, especially in increasing exports to foreign markets for national tactical vehicles. The export market for domestically produced combat vehicles from 2010-to 2019 has had positive growth. The export performance also indicates that the international market is interested in the Indonesian defense industry products.



**Figure 3 Export Value of Tactical Vehicle 2010 – 2019**  
 Sumber: (Viva Budy Kusnandar, 2019)

ASEAN countries such as Vietnam, Thailand, and the Philippines dominate Indonesia's tactical vehicle export market. This positive trend of combat vehicle exports has an average growth of 58% per year. This value is a positive indicator of the ability of the tactical vehicle defense industry to become an independent industry in meeting the needs of the domestic

market for national defense. The expansion of the export market also opens up opportunities for Indonesia to gain economic benefits and improve defense relations with other countries, especially consumer countries for the national defense industry. That means the tactical vehicle industry has become an instrument of state defense diplomacy which is part of Indonesia's defense strategy based on active-defensive.

At the strategic level, the government prepares the development of the national defense posture in the MEF and policy changes in business actors in the defense industry. This policy is a planning step in accelerating the development of the defense industry, each of which has its advantages and risks. Indonesia needs to improve its capabilities in the combat vehicle industry sector (the main defense tool), especially in mastering technology and innovation capabilities. In the light tactical vehicle sector, Indonesia has good capabilities with indicators of expansion into international markets. Government involvement is needed to support the tactical vehicle industry. This support consists of an owned-state and private company as part of the national defense industry. The government and company collaboration will affect the capabilities of industrial players in increasing the ability to meet the domestic needs of the international market.

The light tactical vehicle industry is not a high-tech vehicle, so middle-class private companies can play a role in this sector. The government needs to increase cooperation with industry players in improving and developing technology in this field. Currently, Indonesia lacks research and development activities, especially for achieving advanced defense technology. An important improvement that the government must make is to increase the capacity and function of research and technology development which is an important part of this industry. The existence of research and development (R&D) institutions has proven to have a major impact on the leap in the mastery of defense technology, such as in South Korea, Iran, China, and other emerging power countries in the defense industry (Czulda, 2020; Gouvea, 2018; Su et al., 2021).

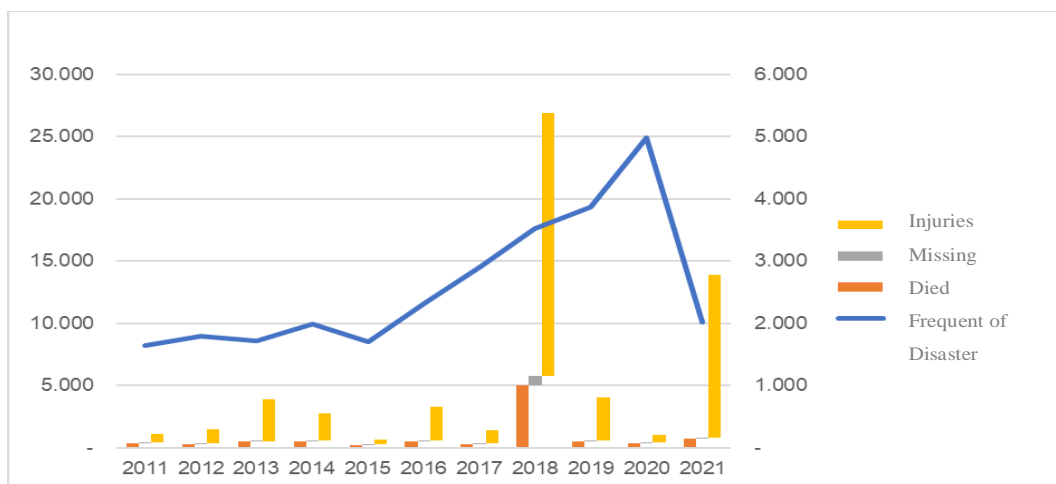
### **Tactical Vehicle Defense Industry in Tactical level Logistic Analysis**

Tactical logistics defines the level of operations or combat at the end of the logistics spectrum. The explanation at this level is different from the strategic level, which tends to run in neutral or peaceful times, intending to gather power. The tactical level is in an unstable environment or, in other words, the use of resources collected for carrying out military operations (Kress, 2016). These three levels cannot be separated because of their hierarchical position, where each level has communication links. Tactical logistics put the analysis on the

use of inventories in operations. Fundamentally, the challenge in logistics is management capability which refers to efficiency, effectiveness, and good governance in the preparation and distribution of logistics (Ghazalie, 2020).

Military operations in TNI can be divided into two categories; war operations and military operations other than war in the form of threats. The concept of threat separated the form threat as actual and potential threats and contained the military, non-military or hybrid threats. (Kementerian Pertahanan, 2015). War and military aggression are still in the category of potential threats that can occur either around Indonesian territory or threaten Indonesia. Regional political developments and political tensions between countries in the region are significant to consider in formulating a national defense strategy. This threat is potential; the calculation of the existence of this threat becomes the basis for developing defense forces and supplying defense forces at the strategic logistics level.

Tactical logistics is a condition in which supplies are collected in peacetime and will be used in military operations. Operations in this context can look at the spectrum of real threats in Indonesia, including post-natural disaster management, terrorism crimes, armed groups, separatist and rebel groups, and others. Statute No.34 of 2004 states that the role and duties of the TNI in operations other than war. The Minister of Defense Regulations number 9 of 2011 and number 6 of 2015 state that the TNI in disaster management in pre-disaster, emergency response, and post-disaster stages. Natural disasters are non-military threats that have a real impact on people's safety. The category of Natural disaster is a non-military threat, and as a threat, we can see this by the frequent disaster and causality and losses by this.



**Figure 4 Data on Casualties and Injuries in Natural Disasters in Indonesia 2010-2021**  
 Source: (Bidang Pengelolaan Data dan Sistem Informasi, 2022)

In some cases, post-disaster management, there are challenges to access and mobility due to the damage to facilities and infrastructure. Floods, landslides, tsunamis, and earthquakes have potential risks to the isolation of disaster areas and disaster victims (Prabowo et al., 2017). Tactical vehicles have functions and advantages in dealing with rugged terrain; this provides support in mobility and speed to reach locations for the evacuation process of disaster victims. Evacuating victims and placing them in evacuation sites is not the end of the post-disaster management process. Health problems are prominent where injured victims need medical treatment and vulnerable groups who need health care (Widayatun & Fatoni, 2013). Second, refugees' logistical needs such as food, clean water, change of clothes, blankets, and others are essential (Hu et al., 2017).

During the evacuation period, there was also the threat of disease and a shortage of clean food and drink supplies. Delivery of logistics to disaster locations is an obligation that must be fulfilled. The role in disaster management is not only carried out by the BNPB or Basarnas teams; the participation of the TNI and related institutions is very important in this operation. The use of tactical vehicles for quick evacuation operations going to or moving from the location. Dispatch of evacuation personnel and medical teams, provision of ambulances to send patients to medical facilities, installation of emergency health facilities, and establishment of public kitchens can be supported using the advantages of tactical vehicles owned by the TNI.

Military operations other than war are operations to handle asymmetric threats, such as anti-terrorism, anti-sabotage, anti-armed rebels, anti-armed criminal groups, and anti-clandestine operations. The establishment of the Indonesian National Army Special Operations Command (KOOPSUS TNI) aims to overcome the threat of terrorism, which is a real threat in Indonesia (Boy, Benjamin. Legionosuko, Tri. Prasetyo, 2020). This command combines elite TNI troops, namely the Sat-81 Gultor of the Indonesian Army Special Forces Corps, the Jala Mangkara Detachment of the Indonesian Navy-Marine Corps, and the Bravo-90 Unit Paskhas TNI AU (Boy, Benjamin. Legionosuko, Tri. Prasetyo, 2020).

The use of tactical vehicles is part of the elements of operations both by TNI troops and related institutions in handling threats. In terms of needs, each institution has its specifications for the needs of its tactical vehicles (Denman, 2020). Increasing the synergy between the TNI, POLRI, and related institutions for dealing with terrorism is needed. In the implementation of training on the introduction of tactical vehicle capabilities, it is necessary to know the conditions and possibilities in the field and prepare operational strategies (BNPT, 2021). Recognition of maneuverability, speed, and mobility in the field is also necessary for training in various operating fields.



The tactical vehicle produced by Pindad, the Komodo 4x4, is one of the tactical vehicles used by Koopsus TNI in anti-terror operations. The Battering Ram version of the Komodo is considered suitable as an anti-terror tactical vehicle because it can break down. One of the superior capabilities is the ability to break through 30cm concrete walls, night-vision capabilities for night operations, and sophisticated communication equipment (Agus Supriyatna, 2020). In the technical study of the Marine Corps Denjaka, tactical vehicles are needed in carrying out tasks, especially at the speed of entering a target. ILSV is a light tactical vehicle used to enter targets in a building or building in carrying out operations. ILSV support can also increase combat capabilities effectively and efficiently. Tactical vehicles' in-field functions impact increasing capabilities in disaster operations and special operations. The ability of tactical vehicles is an increase in mobility and maneuverability, which is theoretically or practically important in distributing logistics to provide support in war or non-war military operations (Li et al., 2021). Light tactical vehicles have a function in law enforcement, both in the implementation of crowd control, special operations in urban areas, fast operations, and others by police agencies (Denman, 2020).

This nationally produced tactical vehicle provides superiority both in fulfilling, developing, and modifying its needs. Nationally produced vehicles can improve the interoperability of defense equipment, facilitate the revitalization and maintenance and prioritize the fulfillment of national needs. National tactical vehicles consist of BUMN and BUMS so that the state can increase collaboration in technology development, especially in modifying vehicle types for combat, ambulance, logistics, and other supporting needs.

## **Conclusion**

Based on laws and government regulations, the national defense industry in the tactical vehicle sector is part of the pillars of national defense development. Based on Statute No.3 of 2002, the tactical vehicle industry is part of the development and development of the defense system through the provision of defense equipment produced by national companies, both BUMN and BUMS. The position of the national tactical vehicle industry at the strategic logistics level as part of the supply chain and source of meeting the needs of the defense industry and part of the upstream to the downstream industry in the defense sector. The tactical vehicle industry is a middle technology defense industry that is still developing, especially in market development and technological capabilities. The tactical logistics level plays a role in military operations, both war and non-war, especially in disaster management activities.

The national defense industry is still developing, especially in the tactical vehicle industry sector. This industry has the potential to develop in line with the government's goal of increasing national independence. Improving defense technology research and cooperation between the government and industry players are essential steps, especially in developing the national tactical vehicle industry and developing national and international markets.

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