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Optimization of Materials Research and Development Function in Creating Defense Equipment Which Modern and Adaptive to Support the Main Tasks of the TNI AD

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Abstract: Research and Development of the Indonesian Army (TNI AD) is one of the special functions in the TNI AD which is inherent in every TNI AD unit and it has a very important role in realizing the modernization of the TNI AD both in terms of personnel, systems, methods and materials. In accordance with this function, every year the ranks of the R&D Center Executive Agency and Main Command carry out R&D activity programs, both Material, personnel, Systems and Methode, which begin with the preparation and submission of R&D proposals. To ensure the optimization of R&D activities, especially material R&D, it is necessary to improve the quality of Human Resources (HR), facilities and infrastructure, and adequate budget support. Human Resources (HR) is one of the important elements for organizational operations in producing quality innovations and R&D products in accordance with the needs of user units, the existence of facilities and infrastructure as the main support for the implementation of a material R&D as well as activity process. Good quality of facilities and infrastructure will produce precise and accurate R&D products as expected. The success in the implementation of materials R&D will certainly not be separated from adequate budget support. The material R&D process requires considerable budget support before becoming an R&D product that is ready for mass production.

Keywords: Optimization, Material R&D Function, Modernization of Defense Equipment, Main Tasks of the Indonesian Army.

INTRODUCTION

The development of science and technology, especially information technology and weapons, has given rise to a race and competition between countries to develop weapons technology using *high technology*. The development of weapons technology aims to create a the country has strong defense system. On the other hand, the development of weapons technology has created increasingly complex forms of threats to the defense of other countries, including the Indonesian nation. As part of the TNI based on Article 7 (1) of Law No. 34 of 2004, the TNI AD has main task for upholding state sovereignty, maintaining the territorial

integrity of the Unitary State of the Republic of Indonesia based on Pancasila and the 1945 Constitution of the Republic of Indonesia, and protecting the entire nation and all of Indonesia's territory from threats and disturbances to the integrity of the nation and state. The Indonesian Army must have a strength which can ward off all forms of threats and has deterrent effect *through* the power of high-tech defense equipment. To realize this, it can be done through Materiel Research and Development activities. as Which listed in Decision Commander Indonesian National Armed Forces Decree Number/1024/XII/2020 concerning the TNI AD Kartika Eka Paksi Doctrine states that one way to answer the challenges and demands of the TNI AD's future duties is through research and development activities. Army Research and Development carries out special R&D tasks and functions, namely to build the capabilities and strength of the Indonesian Army through research and development activities for the operational readiness and preparedness of Indonesian Army units. As a special function, research and development (R&D) of the Indonesian Army is a very important and inherent function to support effectiveness. And efficiency in frame support task main Indonesian National Armed Forces. The Indonesian Army Research and Development has 3 (three) main functions, namely Human Research and Development, System and Method Research and Material Research and Development. The function of Research and Development from the Material aspect is very necessary. so that the Indonesian Army can continue to modernize its defense equipment in facing future threats. R&D must be able to be integrated not only to develop modern weapons systems but also how to carry out the development of defense equipment maintenance effectively so that it becomes a continuous utilization of defense equipment. Material R&D activities are always associated with the existence of human resources, where it is very difficult to obtain skilled and innovative personnel, resulting in a tendency for material R&D activities to only be handed over to work partners. (Surahman, 2009) . Besides that units executor R&D TNI AD generally do not have workshop or repair facilities or laboratory so that the R&D unit that carries out the Materiel R&D activities uses facilities from work partners which has an impact on additional costs which make the budget higher. From the activities data collection carried out by the author obtained data and facts as following:

1. Human Resources are not yet supported by an Engineering or Science Education background. Allocation source power in the organization R&D is one of part important in management R&D (Ummah, 2019). From data obtained in 2021, the number personnel researcher R&D Material in Lineup R&D of Center Executive Agency/Military Area Command of Indonesian Army is as following:
 - a. Pussenif. Officer according to DSPP (3 Personnel), real (3 personnel) with ST degree, (1 Personnel), Non-Commissioned Officer according to DSPP (1 Personnel), real (1 personnel) with ST degree, and Private according to DSPP (4 Personnel), real (3 personnel) with high school education .
 - b. Pussenkav . Officer according to DSPP (4 Personnel), real (3 personnel) with title M.Han , MH, SSTHan., NCO according to DSPP (1 Personnel), real (1 personnel) with ST title , PNS according to DSPP (3 Personnel), real (3 personnel) with high school education .
 - c. Pussenarmed. Officer according to DSPP (3 Personnel), real (1 personnel) with title S.Sos., (1 Personnel). Non-commissioned officer according to DSPP (2 Personnel), real (1 personnel) with ST degree.
 - d. Pussenarhanud. Officer according to DSPP (3 Personnel), real (2 personnel) with title SH, S.IP, MIP, Non-Commissioned Officer according to DSPP (2 Personnel), real (1 personnel) with ST degree.
 - e. Puspenerbad. Officer according to DSPP (4 Personnel), real (3 personnel) with title SE, ST, A.Md, and PNS according to DSPP (1 Personnel), real (1 personnel) with SE degree

- f. Puspallad. Officer according to DSPP (3 Personnel), real (2 personnel) with title MT, S.Sc, non-commissioned officer according to DSPP (2 Personnel), real (1 personnel) with education Vocational School , and PNS according to DSPP (3 Personnel), real (2 personnel) with high school education .
 - g. Pusziad. Officer according to DSPP (3 Personnel), real (2 personnel) with title MT, S.Si., and Private according to DSPP (2 Personnel), real (2 personnel) with high school education.
 - h. Pusbekangad. Officers according to DSPP (5 Personnel), real (4 personnel) with title Ir, S.Sos , SE , SLTA, and PNS DSPP (1 Personnel), real (1 personnel) with high school education.
 - i. Kopassus. Officer according to DSPP (3 Personnel), real (3 personnel) with title SE, MM., and high school.
 - j. Disjasad. Officer according to DSPP (3 Personnel), real (3 personnel) with title S.Pd (2), SLTA, and NCOs according to DSPP (2 Personnel), real (2 personnel) with high school education .
 - k. Disinfohta. Officer according to DSPP (3 Personnel), real (3 personnel) with title MM., ST, High School, Non-Commissioned Officer according to DSPP (1 Personnel), real (1 personnel) with high school education, and civil servants according to DSPP (1 Personnel), real (1 personnel) with SAP degree
 - l. Disjarahad. Officers according to DSPP (5 Personnel), real (3 personnel) with title M.Han , A.Md , and PNS according to DSPP (2 Personnel), real (not filled).
 - m. Dittopad . Officer according to DSPP (3 Personnel), real (2 personnel) with title M.Han, A.Md, and PNS according to DSPP (2 personnel), real (1 personnel) with SE degree .
 - n. Pusintelad. Officer according to DSPP (4 personnel), real (4 personnel) with SIP, MM, SH (2 personnel) degrees, non-commissioned officers according to DSPP (1 Personnel), real (1 personnel) with high school education, and PNS according to DSPP (1 Personnel), real (1 personnel) with S.H. degree
 - o. Secapaad. Officer according to DSPP (4 personnel), real (3 personnel) with High school education (3 personnel), non-commissioned officer according to DSPP (2 personnel), real (2 personnel) with high school education, and PNS according to DSPP (1 Personnel), real (1 personnel) with title A.Md.
 - p. Dislitbangad. Officer according to DSPP (8 personnel), real (8 personnel) with education SE, SH, S.Pd., A.Md (2 personnel), High School (2 personnel).
 - q. Poltekad. Officer according to DSPP (4 personnel), real (2 personnel) with title Drs, MT. Non-Commissioned Officer according to DSPP (2 personnel), real (not filled), and PNS according to DSPP (1 Personnel), real (not filled).
 - r. Pussimpur. Officer according to DSPP (5 personnel), real (3 personnel) with title A.Md., SMU (3 personnel), Non-commissioned officer according to DSPP (5 personnel), real (5 personnel) with SAP, S.Tr.t., Amd, high school education (3 personnel), and PNS degrees according to DSPP (1 Personnel), real (1 personnel) with title A.Md.
2. Limited Means and Infrastructure Supporter Study.

The existence of facilities and infrastructure to support the implementation of material research activities in the R & D ranks of Center Executive Agency/Military Area Command of Indonesian Army still limited both in quantity and quality, especially workshops or laboratories. Until now, the most complete workshop or laboratory is owned by Dislitbangad, although it still requires accreditation from the National Accreditation Committee (KAN) as an acknowledgement that the laboratory is standard in terms of measurement precision. Likewise, other Sarpras such as workshops, testing grounds, storage areas, and others require an assessment of their feasibility.

METHOD

In this author using a qualitative method with a descriptive analysis approach, where according to (Sugiono: 2009; 29) the descriptive analysis method is a method that functions to describe or provide an overview of the object being studied through the data that has been collected (Harun et al., 2022). The purpose of this descriptive research is to create a description or picture of a phenomenon systematically, factually and accurately regarding the data and facts received and the relationship between the phenomena studied. The descriptive analysis approach method was chosen because the author wanted to get a description of the Optimization of the Function of Material Research and Development in Creating Modern and Adaptive Defense Equipment to Support the Main Tasks of the Indonesian Army, through field experience and literature studies in accordance with the theories used as guidelines for the author.

The data sources that will be used in this study use library techniques and direct data collection to TNI units in the Jakarta and Bandung areas. According to Koentjaraningrat, library techniques are a way of collecting data from various materials found in the library space, such as newspapers, books, magazines, manuscripts, documents and so on that are relevant to the research. In line with this opinion, according to Sugiyono, library studies are related to theoretical studies and other references related to values, culture and norms that develop in the social situation being studied (Pramudya et al., 2023). In addition, library studies are very important in conducting research, this is because research will not be separated from scientific literature.

RESULT AND DISCUSSION

Discussion

The Indonesian Army Research and Development has a very strategic role in mastering weapons technology and supporting the readiness of Defense Equipment, especially through studies, research and engineering to find and discover alternative military equipment to support the defense of the Republic of Indonesia. Optimization The function of material research and development in creating modern and adaptive defense equipment to support the main tasks of the Indonesian Army has the aim of finding solutions to problems that exist in the ranks of the Indonesian Army units. Faced with the development of science and technology that has a very strong impact on development technology weapon at this time. Existence R&D In the ranks of Center Executive Agency/Military Area Command of Indonesian Army has a very strategic role in the development of Defense Equipment technology so that it can answer the challenges of future tasks. the future is increasingly complex.

Research and Development (R&D) is an activity that requires knowledge, skills and attitudes that must always be honed by a researcher (Sumarni, 2019). The research positions in the ranks Center Executive Agency/Military Area Command of Indonesian Army are still refers to structural positions in accordance with general career development applicable in the Indonesian Army. This condition will have an impact on the difficulty of improving personnel capabilities. as a researcher who due to by the dynamics of job transfers. To optimize the function of material research and development, 3 aspects will be reviewed, including Human Resources (HR), limited facilities and infrastructure. Supporter study as well as support budget. For that target analysis carried out to obtain a conclusion as an answer to the formulation of the problem that has been determined and can provide suggestions or recommendations to the leadership of the Indonesian Army.

1. Human Resources.

Army Research and Development Agency as field power technical function R&D (LKT), the Indonesian Army has organized the Research and Development Officer Education (Dikpalitbang) activity which is carried out every 2 (two) years. The Dikpalitbang activity is

an effort to develop and improve Human Resources (HR) so that they can produce quality R&D products in accordance with scientific principles. The Research and Development Officer Education activities that have been running so far have only been oriented towards non-material research while material research has not been carried out. With thus so need the organization Education Officer Material Research and Development. Material research and development is needed to improve the capabilities of those implementing material research and development activities.

The Indonesian Army can provide wider opportunities by providing educational scholarships for military personnel and organic civil servants in the field of research and development in order to improve their abilities and deepen their level of education. with to go through Education in college tall so that It is expected to improve academic capabilities, especially in the field of R&D. This is also related to the need for office space Researchers as First, Junior, Middle and Main Researchers. In addition, the Indonesian Army can give priority to engineering graduates (electronics, telecommunications, machinery and so on) college graduates to be recruited as researchers in order to improve the Indonesian Army's research and development.

Center Executive Agency/Military Area Command of Indonesian Army ranks of the Indonesian Army carry out cooperation with research and development institutions and universities that are mutually beneficial in implementing research and development activities and exchanging scientific information on the development of defense technology to catch up in the field of technology. By carrying out cooperation, it can automatically increase the ability of Human Resources (HR) in absorbing technology, especially in the field of defense technology. As stated in Law Number 18 of 2002 concerning the National System of Research, Development and Application of Science and Technology Article 15 paragraph (2): "... Universities, research and development institutions, business entities and supporting institutions are obliged to endeavor to partnership in a relationship that is mutually complementary, strengthening and avoid overlapping which is wasteful". Article it implies to get R&D results optimal and integrated between elements of the Indonesian Army Research and Development, universities, Research and Development institutions, business entities and other related institutions are required to establish R&D cooperation, so that it is expected to produce superior and adaptive technological findings or innovations.

2. Limited Means and Infrastructure Supporters Research.

The limited facilities and infrastructure owned by Center Executive Agency/Military Area Command of Indonesian Army as a support for the implementation of Material Research and Development activities can be overcome by collaborating with Dislitbangad. The facilities and infrastructure owned by Dislitbangad can be utilized by Center Executive Agency/Military Area Command of Indonesian Army as the implementer of Material Research and Development activities in carrying out design and construction activities, making models and making prototypes which are part of its research program.

From the above, to be able to fulfill the need for good facilities and infrastructure in terms of quality and quantity, it can be implemented and planned well, namely:

- a. Dislitbangad as the LKT R&D Indonesiann Army with good facilities and infrastructure can provide permission for the use of facilities by Center Executive Agency/Military Area Command of Indonesian Army who are carrying out Materiel R&D activities in order to produce higher quality products;
- b. Dislitbangad can provide supplies or training to Center Executive Agency/Military Area Command of Indonesian Army personnel who carry out Materiel Research and Development activities regarding the use or operational methods of machinery tools located at Dislitbangad;

- c. Dislitbangad can submit the need for machine tools that are *up to date* with developments in science and technology. technology to the Indonesian Army to support the main tasks of the Indonesian Army Research and Development; and
- d. The Center Executive Agency/Military Area Command of Indonesian Army implementing the Materiel Research and Development activities can provide motivation to personnel in the Research and Development ranks to increase their curiosity in understanding the operation of machine tools and equipment in order to support the optimization of the Material Research and Development activities carried out.

3. Support Budget.

Increasing Material Research and Development activities through design activities build, engineer, research, assessment and application of science and technology with optimal target achievement and based on priority scale and gradually towards the implementation of R&D activities that require a large enough budget. Research planning and budgeting are initial activities carried out by researchers by preparing a budget requirement plan faced with R&D activities that will be carried out. The provisions for the use of research budgets refer to the use of finances that have been determined by the Ministry of Finance of the Republic of Indonesia.

As accountability for the support provided by the Command for the Material Research and Development activities that have been carried out by Center Executive Agency/Military Area Command of Indonesian Army for one budget year, then the final product of Material Research and Development will undergo a functional test to determine the success of the Research and Development activities that have been carried out.

4. Strategy.

In order to formulate a strategy for the analysis process that will be carried out implemented to get problem solving faced with factors that influence both internally and externally, the author uses the SWOT/TOWS technique to get the right strategy in providing innovative ideas. SWOT analysis is an analysis of the internal and external conditions of an organization which will then be used as a basis for designing strategies and work programs. SWOT analysis is used to assess the strengths and weaknesses of the company's resources and external opportunities and challenges faced. Internal analysis includes an assessment of strengths and weaknesses. Meanwhile, external analysis includes opportunities and threats . The problem solving procedure is carried out using SWOT analysis, then after being analyzed, the strategy will be implemented, namely SO (Strength-Opportunity), WO (Weakness-Opportunity), ST (Strength- Threat) strategies. and WT (Weakness-Threat).

Analysis SWOT Diagram

	STRENGTH	WEAKNESS
INTERNAL	1. Commitment from the Higher Command	1. Human Resources Research
	2. Personnel Material Research and Development consists of officers who understand the basis and working mechanisms of staff with ability specialization research and development field	2. Limited laboratory facilities for research
	3. Research budget available	3. Low motivation among TNI AD R&D officers to engage in learning, education, and training.

EXTERNAL	4. R&D organization within the Center Executive Agency of Indonesian Army	4. Most material R&D personnel in Center Executive Agency/ Military Area Command of Indonesian Army do not have a technical or STEM (Science, Technology, Engineering, and Mathematics) educational background
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OPPORTUNITIES	<u>STRATEGY SO</u>	<u>STRATEGY WO</u>
1. Research and Development Indonesian Army as Central Agency (Balakpus) at the level Headquarter Indonesian Army, coordinating various matter which is related Material R&D activities. 2. Existence institution R&D institution outside Indonesian Army. 3. Amount university as a national research asset.	<ul style="list-style-type: none"> • The experience of Dislitbangad researchers and their existence as Central Agency can made into as runway to improve skills personnel. • Cooperate with R&D institutions outside Indonesian Army. • Enhancing Cooperation with universities as Asset National and TNI researchers 	<ul style="list-style-type: none"> • Increase quality resources of material researcher. • Improve the quality of s and quantity of laboratory facilities for research • Conducting research along with Universities.
THREAT	<u>STRATEGY ST</u>	<u>STRATEGY WT</u>
1. The existence of the assumption that personnel and officers R&D The Indonesian Army is a place for problematic officers or non- potential officer. 2. Lack of quality and quantity of opportunity for the personnel and officers Indonesian National Armed Forces Research and Development Agency AD to follow academic education And training/ course.	<ul style="list-style-type: none"> • The experience and achievements of the Researchers can eliminate the negative public opinion regarding the Indonesian Army Research and Development organization. • Give chance to personnel R&D Indonesian Army to pursue education higher. 	<ul style="list-style-type: none"> • Personnel arrangement that have qualifications and expertise in R&D. • Development career and job level. • Strengthening the R&D organization.

Based on the SWOT/TOWS analysis technique above, the strategy of "Optimizing the function of material research and development towards adaptive modernization of defense equipment to support the main tasks of the Indonesian Army" is divided into SO, ST, WO, WT strategies, as follows:

a. Strategy SO.

- 1) The experience of Dislitbangad researchers and their existence as Central Agency can be used as a basis for improving personnel skills.
 - a) Dislitbangad can provide training to Center Executive Agency/Military Area Command of Indonesian Army personnel to improve their abilities and skills in carrying out Material Research and Development research.
 - b) Center Executive Agency/Military Area Command of Indonesian Army in carrying out Material Research and Development activities can encourage its personnel to carry out coordination with Dislitbangad to produce product R&D Which more quality.
- 2) Collaborating with external R&D institutions Indonesian Army.

- a) The need to improve coordination between the ranks of TNI Research and Development and non-TNI Research and Development institutions such as Ministry of Research and Technology, LIPI, LAPAN, BPPT.
 - b) The policy is made by the Commander/Chief/Director of Center Executive Agency/Military Area Command of Indonesian Army as the implementer of R&D activities with the permission of the Chief of Staff of the TNI AD to carry out cooperation with R&D institutions outside the TNI AD in order to improve the quality and quantity of integrated research results.
- 3) Increasing cooperation with universities as National Research Assets and the TNI.
 - a) The Indonesian Army Research and Development can carry out research activities with universities as national and Indonesian Army research assets which can ultimately be integrated and utilized by the Indonesian Army.
 - b) The policy is made by the Commander/Chief/Director Center Executive Agency/Military Area Command of Indonesian Army as the implementer of R&D activities with the permission of the Chief of Staff of the TNI AD to collaborate with universities to improve the capabilities of R&D personnel so that they can improve the quality and quantity of integrated research results.
- b. Strategy ST.
 - 1) The experience and achievements of the researchers can eliminate the negative public opinion regarding the Indonesian Army Research and Development organization.
 - a) The Material Research and Development Products that have been produced by the activity implementers are real evidence that through the experience and capabilities they have, the Indonesian Army Research and Development personnel have greater abilities and skills in efforts to overcome problems that exist in the Indonesian Army units when faced with developments in science and technology.
 - b) The Commander/Chief/Director of Center Executive Agency/Military Area Command of Indonesian Army can provide rewards to R&D personnel who succeed in providing solutions to problems that exist in TNI AD units to develop their careers to a higher level.
 - 2) Providing opportunities for Indonesian Army Research and Development personnel to pursue higher education.
 - a) The opportunity for Indonesian Army Research and Development personnel to pursue higher education, especially in the field of engineering, supported by scholarships is a strategic step to improve the ability of Research and Development personnel to innovate and produce Research and Development products that can answer the challenges of increasingly complex tasks in the future.
 - b) The policy is recommended to the Chief of Staff of the Indonesian Army to provide wider opportunities for R&D personnel to pursue higher education with scholarship support.
- c. Strategy WO.
 - 1) Increase quality resource researcher.
 - a) Development Human Resources. It is carried out in order to equip military personnel/civil servants in a research and development organization so that they are able to carry out higher types of work or positions. Therefore, HR development is identical to the learning process in order to face heavier responsibilities. One form of compensation that provides challenges to personnel This is the granting of higher trust and responsibility.
 - b) Coaching Human Resources. Human resource development is identical to

personnel development, aimed at increasing loyalty and obedience, producing personnel who are efficient and effective, improving quality, skills and fostering the spirit and morale of personnel so as to create a conducive work climate.

- 2) Improving the quality and quantity of laboratory facilities for research
 - a) The procurement of laboratory facilities to support the implementation of research or Material R&D activities by Material R&D activists needs to be improved in terms of both quality and quantity to produce higher quality R&D products.
 - b) The Indonesian Army Research and Development Agency as the Indonesian Army Research and Development Agency which currently has a laboratory and workshop can submit to the Command for support in procuring new equipment which can later be used by all implementers of TNI AD Materiel Research and Development activities
- d. Strategy WT.
 - 1) Arrangement of personnel who have qualifications and expertise in the field of R&D.
 - a) We cannot deny that the availability of human resources for R&D itself still does not have standardized competencies as a researcher, so that understanding of the stages of the R&D process, both material engineering or design and non-material R&D processes, cannot run systematically following the correct research methodology and this also results in R&D productivity not being maximized in carrying out its functions.
 - b) The policy is made by the Chief of Staff of the Indonesian Army in order to fulfill the positions of military personnel and civil servants from non-military institutions/universities. The Indonesian Army gives priority to engineering graduates (electronics, telecommunications, machinery and so on) who are college graduates to be recruited as researchers in order to improve the Indonesian Army's R&D.
 - 2) Development career and level position
 - a) The positions in the R&D organization are structural positions that have not provided opportunities for R&D personnel to develop their careers in accordance with their expertise. To create professionalism of R&D personnel in carrying out R&D activities, there needs to be a functional position for R&D personnel of the Indonesian Army.
 - b) The policy was made by the Army Chief of Staff in order to develop the organization, especially the Research and Development Indonesia Army organization as the LKT R&D TNI AD with the placement of functional positions both for material researchers and non-material researchers.
 - 3) Strengthening organization R&D.
 - a) As center of excellence, R&D institution also need to contribute maximum in settlement problems nation (Ummah, 2019). Building an R&D organization also reflects on the strategic environment of the organization that is developed towards a professional and modern organization, so that it is able to carry out R&D tasks and functions optimally. Every organization will always experience dynamic changes and continue to grow and develop, including R&D organizations. These changes are certainly carried out through the revitalization of the R&D organization.
 - b) Reformulating the objectives and setting targets to be achieved. R&D institutions are now an important part of a larger system for the benefit of an organization. Therefore, its objectives and targets need to be adjusted. Research activities are not only to carry out program activities but the priority is to prioritize research activities that produce science and technology according to real needs.

- c) Making changes to the R&D organizational structure so that it can become an effective vehicle to achieve goals. The structure consists of a hierarchy of authority and division of labor to achieve organizational goals and objectives. A structure that is not clear about its duties and authorities also will result in indifference personnel Which is at in the organization.

CONCLUSION

From the results of research conducted using qualitative research methods and discussions, the author can draw the following conclusions:

Optimization of the material R&D function can be done by implementing human resource (HR) improvement. The improvement of R&D HR can be implemented by providing opportunities for R&D Officers to study at universities, training or by organizing Material Research and Development Training, where currently the Research and Development Training that has been held is Non-material Research and Development Training. By increasing the ability and skills, the skills possessed by the Research and Development Officer will provide benefits to the Indonesian Army Research and Development in terms of mastery and development of science and technology, especially technology. weapons through transfer of technology and transfer of knowledge. Placement of human resources in manning the research field office space based on the abilities, skills and expertise possessed so that it will produce optimal performance and carry out tasks professionally.

Additions means and infrastructure Supporter activity R&D in the form of workshops, laboratories and test fields are very necessary for Center Executive Agency/Military Area Command of Indonesian Army implementing Material Research and Development activities. Submission of needs for procurement of facilities and infrastructure can be done by Dislitbang Indonesian National Armed Forces AD as LKT R&D Indonesian National Armed Forces AD For complete the equipment that already available so that can used by for activity implementer Material Research and Development. With the limited facilities and infrastructure to support research and development activities, the Center Executive Agency/Military Area Command of Indonesian Army implementing research and development activities can do cooperation with body R&D National like BPPT, LIPI and universities to conduct research and development of weapons technology which is expected to produce high-tech defense equipment.

Budget support for R&D activities affects the quality of the products produced. In the implementation of Material R&D activities, budget support can be met by submitting a needs plan. For activity R&D Material by Asrena Army Chief of Staff.

Support Budget. Program activity R&D Material in environment Indonesian National Armed Forces AD includes R&D activities directed at *output* in the form of defense equipment or main components and supporting components that are needed by units in the Indonesian Army. The implementers of the R&D program in the ranks of the Indonesian Army consist of Dislitbangad and R&D of Center Executive Agency/Military Area Command. Budget support Research and Development within the Indonesian Army depends on the number and type of programs supported through the State Revenue and Expenditure Budget and from third parties as independent R&D implementers. R&D budget support has an impact on the quality of R&D products produced. Unfulfilled budget support can hamper R&D activities or cause low product quality. R&D costs tend to be more expensive than procurement of finished products. However, on the other hand, R&D activities will obtain mastery of Defense Equipment technology which will have an impact on independence for the domestic defense industry so that it will gradually reduce dependence on foreign products. Currently the research budget in Indonesia is to study the capabilities and need defense very minimal that is around 0.25 Percent PBN around 0.08% from Product Domestic Gross (GDP) (ACDP, 2013). Part big the source of the R&D budget still comes from the government budget, which is limited in amount, and private

investment in R&D is still very low.

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TUNGAN_TERPUSAT_STRATEGI_MELESTARI