

**Table S1.** Methodological quality ratings based on CASP (*Critical Appraisal Skills Programme*)

| Study                                   | Date | Item 1 | Item 2 | Item 3 | Item 4 | Item 5 | Item 6 | Item 7 | Item 8 | Item 9 | Item 10 | Score | Classification Quality | Scheme |
|---|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|-------|------------------------|--------|
| Reis et al. [40]                        | 2022 | Y      | C      | Y      | Y      | Y      | Y      | Y      | Y      | Y      | C       | 18    | Excellent              | Q1     |
| Gouvea et al. [65]                      | 2021 | C      | C      | C      | C      | C      | C      | Y      | Y      | Y      | Y       | 14    | Moderate               | Q1     |
| Erdağ [66]                              | 2021 | C      | Y      | C      | Y      | Y      | Y      | C      | Y      | Y      | Y       | 17    | Good                   | Q2     |
| Kordova and Fridkin [67]                | 2021 | C      | Y      | Y      | Y      | Y      | C      | Y      | Y      | Y      | C       | 17    | Good                   | Q1     |
| Yeshua-Katz and Efrat-Treister [68]     | 2021 | Y      | Y      | Y      | Y      | Y      | C      | Y      | C      | Y      | C       | 17    | Good                   | Q2     |
| Garfin et al. [41]                      | 2021 | C      | Y      | Y      | Y      | Y      | Y      | Y      | Y      | Y      | Y       | 19    | Excellent              | Q1     |
| Igić et al. [69]                        | 2021 | Y      | C      | C      | Y      | Y      | Y      | Y      | Y      | Y      | C       | 17    | Good                   | Q2     |
| Park and Park [70]                      | 2020 | C      | C      | C      | Y      | Y      | Y      | Y      | C      | Y      | C       | 15    | Good                   | Q1     |
| Sydorov et al. [44]                     | 2020 | Y      | C      | C      | Y      | C      | C      | Y      | C      | Y      | C       | 14    | Moderate               | Q2     |
| Fernandes et al. [47]                   | 2020 | C      | C      | C      | Y      | C      | C      | Y      | C      | Y      | C       | 13    | Moderate               | Q2     |
| Da Silva and Olavo-Quandt [48]          | 2019 | Y      | C      | Y      | Y      | Y      | Y      | Y      | C      | Y      | C       | 17    | Good                   | Q3     |
| Coleman [71]                            | 2019 | C      | C      | N      | C      | Y      | Y      | Y      | C      | C      | C       | 12    | Moderate               | Q2     |
| Vicente Oliva and Martinez-Sanchez [72] | 2018 | Y      | C      | C      | Y      | C      | Y      | Y      | Y      | Y      | C       | 16    | Good                   | Q2     |
| Bradshaw and Connolly [73]              | 2016 | Y      | C      | C      | Y      | C      | Y      | Y      | C      | Y      | Y       | 16    | Good                   | Q2     |
| Hinwood et al. [74]                     | 2015 | Y      | Y      | C      | Y      | Y      | C      | Y      | C      | Y      | Y       | 17    | Good                   | Q1     |
| Ghorshi Nezhad et al. [45]              | 2015 | C      | C      | C      | Y      | Y      | C      | Y      | C      | N      | C       | 12    | Moderate               | Q3     |
| Fiott [2]                               | 2014 | Y      | Y      | Y      | Y      | C      | Y      | Y      | Y      | Y      | Y       | 19    | Excellent              | Q1     |
| [No author name available] [46]         | 2014 | Y      | C      | C      | C      | C      | C      | Y      | C      | C      | C       | 12    | Moderate               | Q4     |
| Emmanuel-Ebikake et al. [75]            | 2014 | Y      | C      | Y      | Y      | Y      | Y      | Y      | C      | Y      | C       | 17    | Good                   | Q2     |
| King and Goodman [76]                   | 2011 | Y      | C      | C      | Y      | Y      | Y      | Y      | C      | Y      | Y       | 17    | Good                   | Q1     |
| Saulters et al. [42]                    | 2010 | N      | Y      | Y      | Y      | Y      | Y      | Y      | Y      | Y      | Y       | 18    | Excellent              | Q1     |
| Jan and Chen [49]                       | 2005 | Y      | C      | C      | C      | C      | C      | Y      | Y      | Y      | Y       | 15    | Good                   | Q3     |
| Barros [77]                             | 2005 | Y      | Y      | Y      | C      | C      | C      | Y      | Y      | Y      | Y       | 17    | Good                   | Q1     |
| Barros [78]                             | 2004 | Y      | Y      | Y      | C      | C      | C      | Y      | Y      | Y      | Y       | 17    | Good                   | Q3     |
| Sandström [43]                          | 2004 | Y      | C      | Y      | Y      | Y      | Y      | Y      | Y      | Y      | Y       | 19    | Excellent              | Q3     |
| Kapstein [79]                           | 2002 | Y      | C      | Y      | C      | C      | C      | Y      | Y      | Y      | Y       | 16    | Good                   | Q1     |
| Bates and Kukalis [80]                  | 1998 | Y      | C      | C      | C      | C      | C      | Y      | Y      | Y      | Y       | 15    | Good                   | Q1     |
| Kapstein [81]                           | 1995 | Y      | C      | C      | C      | C      | C      | Y      | Y      | Y      | C       | 14    | Good                   | Q3     |
| Mean                                    |      |        |        |        |        |        |        |        |        |        |         | 17    |                        |        |

Abbreviations: Y = Yes; C = Cannot tell; N = No | Classification: Yes = 2; C = 1 and N = 0 | Overall classification: Excellent = 18/20; Good = 15/17; Moderate 10/14; Poor = >10

Section A: Are the results valid?

1. Was there a clear statement of the aims of the research? 2. Is the methodology appropriate?

Is it worth continuing?

3. Was the research design appropriate to address the aims of the research? 4. Was the recruitment strategy appropriate to the aims of the research? 5. Were the data collected in a way that addressed the research issue? 6. Has the relationship between researcher and participants been adequately considered?

Section B: What are the results?

7. Have ethical issues been taken into consideration? 8. Was the data analysis sufficiently rigorous? 9. Is there a clear statement of findings?

Section C: Will the results help locally?

10. How valuable is the research?

**Table S2:** Synthesis report ( $n = 28$ )

| Authors                  | Year | Research question   | GAP  | Methods   | Sources of data collection  | Article main findings<br>(Excerpts taken directly from the articles)   | Suggestions for future research   |
|--------------------------|------|---|--|---|---|--|---|
| Reis et al. [40]         | 2022 | RQ1: How is OI improving the defense industry and increasing military capabilities?<br>RQ2: How is the QH innovation model dynamizing the military capabilities of ground forces? | If the defense industry and OI allow the establishment of innovative dynamics in the light of the QH   | Qualitative multimethod research: Systematic Literature Review and Case Study | Scopus<br>Semi-structured interviews<br>Direct observation<br>Official documents  | The results show that, in the light of the quintuple helix innovation model, it was possible to bring applications from theoretical discussion to real life. Moreover, within the scope of the triple helix, it was possible to develop, produce and test military products, allowing improvement of the military capacity of ground forces.   | In the future, ecological concerns will likely increase, so we suggest a greater focus on this area of research   |
| Gouvea et al. [65]       | 2021 | Not identified  | Not identified   | Qualitative research: Comparative study                                       | Not identified  | China is increasingly using its trade and investment leverage with both regions to unbalance their defense choices and strategic defense relationships. China's increasing interactions with African and Latin American countries poses a number of geopolitical implications for both the United States and Western European countries.   | It is becoming clear that recent developments in China's economy and defense forces are creating a new economic, geopolitical, and defense paradigms around the globe. This new paradigm offers a number of national security challenges and opportunities for the United States and Western European countries in Latin America and in Africa. |
| Erdağ [66]               | 2021 | Not identified  | To understand the reasons for the military spending of Turkey and analyze its military spending between 2000 and 2018 when threat perceptions changed significantly. | Quantitative: Expenditure database  | This article examines Turkey's military spending between 2000 and 2018 by using Stockholm International Peace Research Institute's (SIPRI) Military Expenditure Database and its effects on bilateral and regional relations. | This article examines Turkey's military spending between 2000 and 2018 by using Stockholm International Peace Research Institute's (SIPRI) Military Expenditure Database and its effects on bilateral and regional relations. It argues that the increase in Turkey's military spending in the 2000s can be explained not only by diversified security threats but also by the quest for autonomy, the desire to be a regional actor, economic capacity increase, efforts to nationalize the defense industry, and the North Atlantic Treaty Organization (NATO) alliance's inability to form a sufficient umbrella time in the face of security threats, notably in the face of missile threats. The results show that the traditional alliances and strategic cooperation do not guarantee Turkey's military demands, and its military spending increases, while the proportion of military spending in GDP falls, due to economic growth. | Not identified  |
| Kordova and Fridkin [67] | 2021 | Not identified  | The need for an effective, efficient   | The research paradigm   | This paper uses heterogeneity and   | Findings from an in-depth analysis of 46 classified defense SoSs shows a need to focus on three main   | This paper presented results of a data science analysis of 46 classified  |

|                                     |      |   |   |  |   |   |   |
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|                                     |      |   | <p>approach to risk management is considerably more important for defense industries, because they are exposed to risk in the early stages of development.</p>  | <p>combined analytical, quantitative, and qualitative methods.</p> | <p>homogeneity analysis between risk factors with Cochran's Q test and multidimensional scaling in order to present the complexity of the risk factors relevant to defense systems of systems (SoSs), and it proposes a methodology for identifying, analyzing, and monitoring the risks that they face. The research also included semi-structured interviews.</p> | <p>risks faced by defense projects: insufficient human resources, changes in the original specifications, and lack of other (nonhuman) resources.</p>   | <p>defense SoSs. The authors recommend that future research expand the study to other defense industries in additional countries, with different clients and suppliers.</p>   |
| Yeshua-Katz and Efrat-Treister [68] | 2021 | <p>What are the perceived cultural and social factors that contribute to the innovation culture in Israel?</p>  | <p>The Israeli defense industry is a frequently cited factor when explaining Israeli's innovation success. This, however, only partly explains why so much innovation is occurring in one place.</p>  | <p>Mix-method research: interviews and survey</p>                  | <p>In Study 1, we interview a panel of six experts who are key figures in the Israeli information technology industry; in Study 2, we survey thirty MBA students, asking them about the sources of Israel's innovation culture.</p>   | <p>Theoretically, this study proposes a new look at innovation culture values. By extending previous culture of innovation analyses, this study highlights the way in which the mix of both collectivist Eastern and individualistic Western cultures values, accompanied with a combination of novelty and appropriateness of ideas, leads to exceptionally high levels of innovation. Empirically, this study informs us about the multicultural aspects that may contribute to the development of innovation clusters worldwide.</p>   | <p>First, this study examines cultural factors that elicit innovation as perceived by key figures in the Israeli high-tech industry and its future managers. In the future, a richer data collection option would be to study international innovation experts working with Israeli teams. Second, future research should examine whether teams with cultural combinations (i.e., Israel or USA and Singapore) indeed yield higher innovation, compared with homogenous teams, or teams with other culture combinations.</p>      |
| Garfin et al. [41]                  | 2021 | <p>Study DoD's adaptation efforts in the context of best practices currently being adopted by a growing global community of climate adaptation scientists working with a wide range of stakeholders and organizations (goal).</p> | <p>The United States Department of Defense (DoD) recognizes growing climate risks across its responsibilities as land manager, operator of hundreds of installations, and in its core mission to protect national security. However, DoD climate risk reduction is complicated by frequent leadership turnover among base commanders, which encourages focus on</p> | <p>Qualitative case study research</p>                             | <p>Multi-project workshop and interviews with DoD personnel</p>   | <p>The authors found that success in working with Defense installations hinges on linking risks of increasing climate-related impacts to DoD's ability to achieve its mission objectives at installations. Workshop participants offered insights into barriers to adaptation, including access to decision-makers in a hierarchical organization, leadership focus on near-term challenges, insufficient training or capacity to integrate climate information into short and long-term decisions, and rapid turnover in leadership. They also found opportunities for mainstreaming climate risk management into DoD activities, including emphasizing risks to DoD's mission, opportunities to form symbiotic partnerships with external partners, and the potential for standardized procedures for considering physical climate risks that could be integrated across the DoD to achieve longer-term solutions to climate change challenges.</p> | <p>Whereas directives from the Pentagon are a strong motivator, integration of climate-smart strategies into day-to-day practices and long-term planning processes by military and civilian employees at the installations will be needed to manage physical climate risks. Integrating top-down and bottom-up strategies, combined with the flexibility to partner and gain expertise from networks of researchers and stakeholders, will help navigate the complex terrain of DoD's new mission to adapt to climate change.</p> |

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|-----------------------|------|--|---|---|--|--|---|
|                       |      |  |   | near-term challenges, and changing US government priorities that downplay climate risk. |  |  |   |
| Igić et al. [69]      | 2021 | Main hypothesis: H1: ELW has a direct positive effect on ZAV implementation. | Not identified  | Quantitative. Survey  | It was conducted a survey using a questionnaire given to four production plants in the Serbian military industrial complex. Almost 500 respondents participated in this survey with a response rate of over 90%. | In this article, preliminary empirical proofs for the influence of ELW on the implementation of the ZAV and OC are presented.  | Future research should be improved by the inclusion of other mediating variables, e.g., work engagement, authorization, motivation and confidence.  |
| Park and Park [70]    | 2020 | Not identified   | Rapid urban development and changes in the national defense environment have required civil–military coexistence plans<br>Insufficient scientific research on financial security management necessitates the solution of the scientific task, which is to ensure the financial security of defense enterprises, taking into account the threats and opportunities for the development of their interaction with the environment on the basis of the development of conceptual, methodological and applied components. | Fundamental Research  | In this study, as the basic data for proceeding with the underground-type ammunition magazine construction, the effect of reducing the safety distance was analyzed.   | It was concluded that research to specify design methods for underground-type ammunition magazines was urgently required to vitalize future underground-type ammunition magazine projects.<br><br>The article investigates the specifics of the military-industrial complex functioning in Ukraine. Theoretical analysis has shown that the development of the country’s defense industry and the state of enterprise’s financial security within this industry have a dual impact on various components of the national security system: is a realization tool of the national interests, which in turn creates opportunities for its strengthening, and it can also be a source of threats to the state’s economic security by its components due to the accumulation of internal negative elements on enterprises (insufficient development and low level of military products’ competitiveness, obsolescence of fixed assets at enterprises, etc.), as well as due to the low ability of enterprises to respond adequately to the challenges arising from changes in external conditions and factors (disruption of sustainable cooperation, increased competition between different military products in domestic and foreign markets, etc.). | It will be necessary to apply a particular construction case in the future to verify the results of this study, and to carry out specific studies on constructability, economics, safety, and maintenance of detailed design methods. |
| Sydorov et al. [44]   | 2020 | Not identified   |   | Qualitative case study research   | Statistical analysis, comparison, economic-mathematical and graphic methods  |  | Not identified  |
| Fernandes et al. [47] | 2020 | Not identified   | Not identified  | Qualitative case study research   | Reports, analysis  | This article aims to describe the first initiative of the army in order to establish new productive arrangements involving companies and academia  | Not identified  |

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|---|------|---|--|--|--|---|---|
|   |      |   |  |  |  | not only by using funding but also its intellectual property and to report its first outcomes. The pilot aimed to test this model of open innovation arenas for developing dual technologies from a very incipient stage to foster the industries' sustainable development and reduce its dependence from government funding and demands  |   |
| Da Silva and Olavo-Quandt [48]          | 2019 | How can the model of the Triple Helix, implemented by the Brazilian Army, called SisDIA, contribute to the structure and the promotion of innovation in defense of existing habitats in the headquarters of Military Regions? | The problem is that since the year of 2016, the Brazilian Army created the Defense, Industry and Academy System (SisDIA) of Innovation, a conceptual model of the Triple-Helix, aiming to promote the development of innovations taking advantage of the Army presence in all regions of the country | Exploratory, qualitative and descriptive approach, and the case study of the Brazilian Army  | Institutional documents of the Brazilian Army. Studies published at the website from the Ministry of Science, Technology Innovation and Communications (MCTIC), the International Association of Science Parks and Areas of Innovation (IASP) and the National Association of Entities that Promote Innovative Enterprises (Anprotec). Direct and participative observation. | This article intends to identify the technological parks existing in the headquarters of military regions of the Brazilian Army, with the premise that these habitats are capable of forming nuclei of governance of technological innovation. It was possible to conclude that through SisDIA and the implantation of governance nuclei of innovation in the Brazilian Army, inserted in technological parks, there will be a possibility of interaction between the Triple Helix (government-industry-academia), in a collaborative way, intending to reinforce the scientific and technological expression of the actors involved and to boost the development in social and economic dimensions according to regional potentialities.   | Not identified  |
| Coleman [71]                            | 2019 | Not identified  | Not identified   | Exploratory, qualitative and descriptive approach  | Descriptive  | Guantánamo is infamous as a site of extra-legal detention in the wake of 9/11; more than a single site, it is part of a web of the United States' militarization operating in the Global South. An area of the military base is now being revitalized as a new camp for climate change-related mass migration events predicted to occur throughout the Caribbean and Latin America.   | Not identified  |
| Vicente Oliva and Martinez-Sanchez [72] | 2018 | What would the difference in an actor's behavior be as a result of the foresight intervention?  | The literature examines the theoretical foundations of foresight, which generally recognizes that there is a gap between practice and theory in the field  | The analysis is based on a content analysis of public domain Spanish Defense National Foresight Exercise, and a study directed to analyze the impact on defense technological and industrial base. | Technology roadmaps  | Foresight studies on the defense and security environment uses hybrid methodologies, but rarely involve all of the stakeholders, and specially the citizens. The authors place a particular emphasis on the impact of these defense and security foresight studies, and following policies to increase the competitiveness and advanced technologies in the future. The analysis of the Spanish contractors allows an evaluation of the roadmaps as a policy instrument for the industrial defense industry. The main challenges for the next exercises in the European countries are to increase the interest in the firms' intelligence systems, and the participation and representation of citizens as a way to guarantee their rights. Therefore, a technology roadmap must be complemented with other more participative foresight methods. | Future studies about the impact of foresight exercises in the defense sector should incorporate a wider focus (i.e. citizens, research centers) because they influence and have implications for strategic decision-making in science and technology systems. Therefore, the impact of TRs should be larger than we have found and could even go beyond the S&D industry. A longitudinal study could be useful to analyze the impact of every phase of the study and improve the dissemination and learning phase that support new policy instruments; the efficiency of the exercise could even be measured in economic terms for some of the agents of the national system, such as firms |

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|----------------------------|------|--|--|---------------------------------|---|--|---|
| Bradshaw and Connolly [73] | 2016 | Can Russia afford to continue to strengthen its military capability in the face of falling oil and gas export revenues, economic recession, and growing social demands on the federal budget? How do the changes in the global oil and gas industry – and upheavals in Russia’s own oil and gas industry – affect Russia’s ability to undertake the rearmament that has underpinned its more muscular role in the world? What might happen next: détente revisited, or a new Cold War? | The leaders of today’s Russia face a twenty-first-century version of this dilemma, weighing the trade-off between spending on guns or butter.  | Qualitative case study research | Descriptive   | It is clear that developments in the oil and gas industry—both at the global level and in Russia—are imposing financial constraints on the Kremlin and will be likely to continue to do so in the near term. While it is evident that the Russian leadership continues to assign a great deal of importance to enhancing its military capabilities—and had done so well before the crisis in Ukraine—it is equally clear that tough choices need to be made if this revitalization of capabilities is to continue at its current pace. | Not identified  |
| Hinwood et al. [74]        | 2015 | Not identified   | Most studies of metals’ exposure focus on the heavy metals. There are many other metals (the transition, alkali and alkaline earth metals in particular) in common use in electronics, defense industries, emitted via combustion and which are naturally present in the environment, that have received limited attention in terms of human exposure. | Qualitative case study research | The authors analyzed samples of whole blood (172), urine (173) and drinking water (172) for antimony, beryllium, bismuth, cesium, gallium, rubidium, silver, strontium, thallium, thorium and vanadium using ICPMS. | In general, most metals’ concentrations were low and below the analytical limit of detection with some high concentrations observed. Few factors examined in regression models were shown to influence biological metals’ concentrations and explained little of the variation.  | Further study is required to establish the source of metals’ exposures at the high end of the ranges of concentrations measured and the potential for any adverse health impacts in children.   |
| Ghorshi Nezhad et al. [45] | 2015 | Not identified   | Not identified   | Mixed methods                   | Hybrid methods in multicriteria decision-making (HMCDM)   | The Multiple Criteria Decision Making perspective can be considered as a powerful framework and methodology in this way. This perspective can divide the topic into sub-topics and make the decision-making process easier. The SWARA method has a powerful and logical perspective for decision and policy-making because priorities have different dimensions, such as politics, culture, and  | Planning is presented based on the priority of results. Investing priorities should be considered based on the results of Table 15 (see article). This new framework can be considered as a framework for future and similar research |

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|                                 |      |  |   |   |   |   | so on. In this study SWARA is applied in the process of decision-making for evaluating the weights and priorities of criteria. WASPAS is a new methodology that is very reliable for calculations. In this study, WASPAS is applied to evaluate and rank alternatives. |  |
| Fiott [2]                       | 2014 | Is Europe’s defense greening best characterized by a process of regulation defined as policy and legal initiatives and processes designed to steer decisions, in this case in the direction of green behavior? | There is little evidence to suggest that the defense sector in Europe has taken a holistic approach to the green agenda, but neither can that sector be considered as following only a “ceremonial” approach. | Mix-method research<br>Qualitative sources-primary information sources: e.g. official documents.<br>Quantitative sources: e.g., data from the British MoD and EDA<br>Qualitative sources: e.g. interviews | This article relies mainly on an examination of key primary information sources, such as government and EU policy documents, and a host of secondary sources that relate to the greening of organizations. The article nevertheless draws on quantitative data provided by the British MoD, the EDA, and a range of European-based defense firms where necessary, and available to illustrate progress and failure. Eight of the interviews conducted are directly cited in this article. | This article argues that the defense sector in Europe is far from being a holistic green actor  | Not identified   |  |
| [No author name available] [46] | 2014 | Not identified   | Not identified  | Qualitative case study research   | Descriptive   | The increasing limitations that the environment is placing on organizations worldwide are changing the skills that employees require. IEMA has been calling for all employees—at every level of responsibility, across all areas of business and industry—to be armed with environmental knowledge.   | Not identified   |  |
| Emmanuel-Ebikake et al. [75]    | 2014 | Not identified   | Shepherd and Gunter (2006) identified a gap in SCM literature where limited reflection had been one on the important subject of performance measurement.  | Quantitative research   | The research employs a case study approach to identify a research gap in the area of supplier performance measurement and proposes five dimensions to assess supplier sustainability from the review of literature and industry practice while employing a systematic approach to generate measures for each dimension with suggested actions to improve sustainability.  | The sustainability measures, dimensions and improvement actions developed were validated with industrial experts from three defense companies and implemented as a sustainability system. A case study was applied and the results were generated. The paper offers managerial implications about the need to consider the survivability of suppliers in the long term, especially in the current economic climate and think about mitigation strategies to enable economic sustainability. | Future research could include further case study application and application of dimensions and measures to other industries.   |  |

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|-----------------------|------|----------------|--|-----------------------------|---|--|---|
| King and Goodman [76] | 2011 | Not identified | Not identified   | Qualitative research        | <p>The article frames the long-term course for policy decision-making at the highest levels.</p> <p>A proactive and holistic approach can facilitate efficient research, design, testing, evaluation, and fielding for novel and off-the shelf products, thereby assisting developers, end users, and other diverse stakeholders in better understanding tradeoffs in the defense industry and beyond. By prioritizing mechanisms such as strategic life-cycle environmental assessments (LCEA); programmatic environment, safety, and occupational health evaluations (PESHE); health hazard assessments (HHA); and other innovative platforms and studies early within systems engineering, various non-lethal military technologies have been successfully developed and deployed.</p> | <p>The reports demonstrate that climate change and energy are now mainstream elements of national security planning, and can be assessed within the frameworks used to evaluate other threats, risks, and responses. However, the exact magnitude of the threat posed by climate change is difficult to calibrate in part because the language used by scientists to predict uncertainty and the confidence levels of judgments is not sufficiently clear. The defense community has a vast amount of experience exploring and dealing with uncertainty</p> <p>These efforts provide a framework for addressing complex environment, safety, and occupational health risks that affect personnel, infrastructure, property, socioeconomic, and natural/cultural resources.</p> <p>This paper highlights the Urban Operations Laboratory process utilized for inclusive and transformative environmental analysis, which can translate into advantages and progress toward sustainable systems.</p> | <p>Scientists trying to better describe the effects of climate change may be able to draw lessons from the defense community's approach to uncertainty including how to better communicate findings to wide audiences including policy-makers.</p> <p>An integrated, comprehensive, multidisciplinary, and iterative analyses involving flexible groups of specialists/subject matter experts can be applied at various spatiotemporal scales in support of collaborations.</p> |
| Saulters et al. [42]  | 2010 | Not identified | Not identified   | Systems-based methodologies |   |  |   |
| Jan and Chen [49]     | 2005 | Not identified | The development of an industrial system is a complex and dynamic process. In developing countries, industrial development is even more complicated because it involves the | Qualitative research        | Descriptive   | <p>This study discusses the viewpoints of ecological systems and system dynamics to summarize the analysis of the development of Taiwan's automobile, semiconductor, and national defense industries. In addition, an evolutionary perspective is used to examine the development of the information technology and semiconductor industries. The results show that different systems viewpoint provides different insights into industrial development.</p>   | <p>Therefore, more diverse systems approaches are needed to further our understanding of the development of industrial systems.</p>   |



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|                |      |   | interactions of domestic firms and multinational corporations (MNCs), the role of the government, and the development of technology.   |   |                                 |  |  |
| Barros [77]    | 2005 | What are the reasons for a defense enterprise to be technically inefficient and to work below the production function?  | Not identified   | Quantitative research                                     | Not identified                  | The article proposed a simple framework for the evaluation of defense-sector companies and the rationalization of their operational activities.  | The author propose a policy revision to enforce efficiency, based on a governance environment framework.   |
| Barros [78]    | 2004 | What is the motivation of a government to fund inefficient public enterprises?<br><br>what is the motivation for the government not to oversee properly the performance of a public enterprise? | Not identified   | Nonparametric method in operations research and economics | Data envelopment analysis (DEA) | The article has proposed a simple framework for the evaluation of defense-sector companies and the rationalization of their operational activities.<br><br>The general conclusion is that an organizational governance environment with accountability, transparency and efficiency incentives, which explicitly oblige the defense sector companies to achieve efficiency in their operational activities, is needed to overcome the deficits in technical and allocative efficiency observed in the companies over the period analyzed.                                      | The banning of military personnel from the management of defense enterprises, in addition to the privatization and outsourcing are also recommended as policies to improve the economic efficiency of this industry in Portugal, if it is to survive.  |
| Sandström [43] | 2004 | The question comes down to how a defense organization, such as FMV, can move into a non-defense mode, in this case in regard to greening  | Civil organizations are also ahead of the military'. Swedish Defense Material Administration (FMV) was therefore moving to close this gap, but the process housed two areas of tensions. | Qualitative case study research                           | Interviews                      | FMV is particularly influenced by an industry-driven institutionalization of greening, but that there also are signs of countermoves and thereby spaces in which reflexive dialogues on the taken-for-granted approach to greening might occur.  | By following others' approaches to environmental policy-making, does the uniqueness of one's own organization's type of process, environmental impact, organizational culture and phase in life become peripheral or even suppressed? Also, what does this say about the future developments of organizational approaches to greening? Are the forces of industry too strong to allow for alternatives to develop? |
| Kapstein [79]  | 2002 | Not identified  | Weapons procurement decisions only provide a single case study with respect to alliance relations- hardly a complete view of the political landscape.                                    | Qualitative case study research                           | Descriptive                     | Ever since its inception, NATO has striven to promote the 'rationalization, standardization and inter-operability' of alliance weaponry. From this defense-industrial perspective, the alliance has made great strides over the past decade. For its part, the United States has undertaken a major reform of its technology-transfer bureaucracy, with the aim of promoting more transatlantic weapons collaboration. Alongside that development, the Europeans have engaged in a radical restructuring of their defense industries, making them bigger and more competitive. | These changes suggest continuing efforts on each side of the Atlantic to maintain if not strengthen their security relationship.   |

|                           |      |  |  |                                 |             |  |                |
|---------------------------|------|--|--|---------------------------------|-------------|--|----------------|
| Bates and<br>Kukalis [80] | 1998 | But how are their suppliers performing and what strategies are they pursuing?              | The aerospace/defense industry is in decline. Revenues and profits are falling and experts believe the decline will last into the foreseeable future. The prime contractors, are pursuing classic large firm strategies for declining industries, e.g., mergers, twinning, diversification, etc. | Qualitative case study research | Descriptive | Two-thirds of the second-tier firms had suffered significant revenue declines in the four year period. It seems logical to expect these supplier firms would develop strategies appropriate to declining industries. Generally, the firms are doing just that. They are pursuing cost reduction/containment strategies and they are developing strategic thrusts to enter or expand their revenues from commercial markets. Of the four most commonly used strategies, two involve either domestic or international defense markets and one involves existing defense products. Only one strategy did not incorporate any involvement with the defense industry. An examination of the strategic planning systems reveals little or no changes have been made. The firms enter commercial markets with high hopes and a realistic understanding of the obstacles they face, but they still regard the aerospace/defense industry as their primary source of revenue. | Not identified |
| Kapstein [81]             | 1995 | Why do market mechanisms not suffice to reallocate resources as government outlays change? | The regional impact of the changes in Federal budgetary expenditures has received little attention from scholars of the former Soviet Union.   | Qualitative case study research | Descriptive | The article argues that the donor nations should instead strive to provide a "package" of assistance to defense-dependent regions, taking into account such issues as employment generation and the development of small and medium enterprises, the quality of telecommunications, infrastructure, and the environment and the ability of local governments to finance and manage the social assets of restructured enterprises.  | Not identified |

**Table S3.** General information of selected articles

| Study                               | Date | Title  | Source Title                                     | Vol | Issue | Start Page | End Page | Cited |
|-------------------------------------|------|--|--|-----|-------|------------|----------|-------|
| Reis et al. [40]                    | 2022 | Defense industries and open innovation: ways to increase military capabilities of the Portuguese ground forces | <i>Defense Studies</i>                           | 22  | 3     | 354        | 377      |       |
| Gouvea et al. [65]                  | 2021 | China's diversification strategy in Latin American and African markets: Defense software and hardware exports  | <i>Thunderbird International Business Review</i> | 63  | 4     | 463        | 475      |       |
| Erdağ [66]                          | 2021 | Security Environment and Military Spending of Turkey in the 2000s  | <i>Contemporary Review of the Middle East</i>    | 8   | 1     | 120        | 139      | 1     |
| Kordova and Fridkin [67]            | 2021 | Risk management for defense SoS in a complex, dynamic environment  | <i>Sustainability</i> (Switzerland)              | 13  | 4     | 1789       | 1        |       |
| Yeshua-Katz and Efrat-Treister [68] | 2021 | 'Together in the tech trenches': a view of Israel's innovation culture   | <i>Innovation: Organization and Management</i>   | 23  | 3     | 337        | 353      | 1     |

|   |      |  |   |     |        |      |      |    |  |
|---|------|--|---|-----|--------|------|------|----|--|
| Garfin et al. [41]                      | 2021 | A new mission: Mainstreaming climate adaptation in the US Department of Defense  | <i>Climate Services</i>   | 22  | 100230 |      |      |    |  |
| Igić et al. [69]                        | 2021 | The relationship between ethical leadership, organizational commitment and Zero Accident Vision implementation in the defense industry   | <i>International Journal of Occupational Safety and Ergonomics</i>      | 27  | 4      | 1076 | 1086 | 1  |  |
| Park and Park [70]                      | 2020 | Effect of underground-type ammunition magazine construction in respect of civil and military coexistence                                 | <i>Sustainability (Switzerland)</i>                                     | 12  | 21     | 9285 | 1    |    |  |
| Sydorov et al. [44]                     | 2020 | Financial Security Management of Enterprises Operating in the Defense Industry   | <i>Journal of Security and Sustainability Issues</i>                    | 9   | 4      | 1483 | 1495 |    |  |
| Fernandes et al. [47]                   | 2020 | The triple helix approach in the defense industry: A case study at the Brazilian Army  | <i>World Review of Science, Technology and Sustainable Development</i>  | 16  | 1      | 22   | 43   | 1  |  |
| Da Silva and Olavo-Quandt [48]          | 2019 | Defense system, industry and academy: The conceptual model of innovation of the Brazilian army   | <i>Journal of Technology Management and Innovation</i>                  | 14  | 1      | 53   | 62   | 2  |  |
| Coleman [71]                            | 2019 | El Sur También Existe: Imagining futures   | <i>Cultural Dynamics</i>  | 31  | 4      | 365  | 374  |    |  |
| Vicente Oliva and Martinez-Sanchez [72] | 2018 | Technology road mapping in security and defense foresight  | <i>Foresight</i>  | 20  | 6      | 635  | 647  | 3  |  |
| Bradshaw and Connolly [73]              | 2016 | Barrels and bullets: The geostrategic significance of Russia's oil and gas exports   | <i>Bulletin of the Atomic Scientists</i>                                | 72  | 3      | 156  | 164  | 7  |  |
| Hinwood et al. [74]                     | 2015 | Maternal exposure to alkali, alkali earth, transition and other metals: Concentrations and predictors of exposure                        | <i>Environmental Pollution</i>  | 204 | 256    | 263  |      |    |  |
| Ghorshi Nezhad et al. [45]              | 2015 | Planning the priority of high tech industries based on SWARA-WASPAS methodology: The case of the nanotechnology industry in Iran         | <i>Economic Research-Ekonomika Istrazivanja</i>                         | 28  | 1      | 1111 | 1137 | 38 |  |
| Fiott [2]                               | 2014 | Reducing the Environmental Footprint? Competition and Regulation in the Greening of Europe's Defense Sector                              | <i>Organization and Environment</i>                                     | 27  | 3      | 263  | 278  | 10 |  |
| [No author name available] [46]         | 2014 | BAE Systems takes environmental training to the top: Senior executives learn how to integrate green issues into their everyday functions | <i>Human Resource Management International Digest</i>                   | 22  | 1      | 7    | 10   | 1  |  |
| Emmanuel-Ebikake et al. [75]            | 2014 | Supplier sustainability assessment for the UK defense industry   | <i>International Journal of Productivity and Performance Management</i> | 63  | 8      | 968  | 990  | 3  |  |
| King and Goodman [76]                   | 2011 | Defense community perspectives on uncertainty and confidence judgments   | <i>Climatic Change</i>  | 108 | 4      | 803  | 809  | 5  |  |
| Saulters et al. [42]                    | 2010 | Enhancing technology development through integrated environmental analysis: Toward sustainable nonlethal military systems                | <i>Integrated Environmental Assessment and Management</i>               | 6   | 2      | 281  | 286  | 2  |  |
| Jan and Chen [49]                       | 2005 | Systems approaches for the industrial development of a developing country  | <i>Systemic Practice and Action Research</i>                            | 18  | 4      | 365  | 377  | 17 |  |

|                        |      |   |  |    |   |     |     |    |
|------------------------|------|---|--|----|---|-----|-----|----|
| Barros [77]            | 2005 | Governance and incentive regulation in defense industry enterprises: A case study   | <i>European Journal of Law and Economics</i>                     | 20 | 1 | 87  | 97  | 3  |
| Barros [78]            | 2004 | Measuring performance in defense-sector companies in a small NATO member country  | <i>Journal of Economic Studies</i>                               | 31 | 2 | 112 | 128 | 38 |
| Sandström [43]         | 2004 | Greening the Swedish Defense Material Administration-A case study on the force of industry in environmental policy-making | <i>European Environment: Environmental Policy and Governance</i> | 14 | 6 | 356 | 367 | 1  |
| Kapstein [79]          | 2002 | Allies and armaments  | <i>Survival</i>  | 44 | 2 | 141 | 155 | 16 |
| Bates and Kukalis [80] | 1998 | The endgame in aerospace: a disaster waiting to happen?   | <i>Long Range Planning</i>                                       | 31 | 4 | 615 | 622 | 1  |
| Kapstein [81]          | 1995 | The economic transition in defense-dependent regions of Russia  | <i>Defense and Peace Economics</i>                               | 6  | 3 | 253 | 261 | 5  |

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