

SUSTAINABLE MILITARY UNIFORMS – CONCEPTUAL APPROACHES AND GOOD PRACTICES

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ABSTRACT

Sustainability, in the context of sustainable development, has attracted the interest of military decision-makers who are tasked with both ensuring military personnel’s basic needs and efficiently managing defence resources. In this respect, military uniforms represent one area in which sustainable solutions can and should be adopted in line with the regulatory framework established at the level of the European Union for all textile products. Therefore, this article explores the available literature and analyses cases of good practices adopted by various military armed forces to highlight the advantages of this approach and draw valuable lessons. The primary aim is to offer the main dimensions which characterize a sustainable military uniform, providing useful insights for military logisticians and other specialists involved in supplying military personnel with products that align with current trends in the textile industry, meet soldiers’ basic needs, and contribute to achieving sustainable development goals. Additionally, this article looks into the advantages retained in the military domain, also highlighting the need to change the actual production and consumption paradigm in this field.

KEYWORDS:

Production, sustainable textiles, sustainable military uniforms, OEKO-TEX certification, circular economy

1. Introduction

One of the seventeen Sustainable Development Goals (SDGs), specifically SDG 12, focuses on promoting “sustainable production and consumption patterns”. This goal includes specific targets that aim to implement programs supporting sustainable production and consumption, reduce waste, and adopt sustainable procurement practices (United Nations, 2015, p. 22-23). In the military organization, while production activities are limited and consumption is more prominent due to its role as a public consumer, there is an increasing focus on adopting sustainable solutions.

Most challenges stem from the need to rethink the current military consumption patterns. Following the recent strategic documents issued shortly after the onset of the war in Ukraine, European Union and

NATO member states are urged to enhance the efficiency of defence resource management by adopting sustainable practices. These documents emphasize that a sustainability-focused vision allows allied armed forces to address a wide range of threats, including those posed by climate change, human resource shortages, lack of adaptability, and the People’s Republic of China’s increasing control over essential natural resources (North Atlantic Treaty Organization, 2022, p. 1-5). In this context, efforts are focused on transitioning to sustainable energy sources, reducing greenhouse gas emissions (North Atlantic Treaty Organization, 2022, p. 11), and equipping forces with environmentally friendly technologies (Council of the European Union, 2022, p. 25-38).

While these adaptive measures are crucial, the scope of sustainability is much broader, also including initiatives that address basic human needs (Quoquab & Mohammad, 2020, p. 8), such as clothing (Apud Kostadinova, 2016, p. 225-226). With the textile industry accounting for 20% of global pollution (European Parliament, 2024), there is an urgent need to change consumption behaviours in this sector (European Parliament, 2023, p. 1-23). Even in the military field, the need to identify sustainable characteristics of goods and services procured by the armed forces has been highlighted (US Department of Defense, 2018, p. 1-16). However, clear guidelines or specific results for military uniforms have yet to be published.

It is also important to note that, in some countries, the legal framework supports the adoption of sustainable practices in the textile industry. It is the case of USA, South Korea, Italy and Cyprus, which have already established sustainable public procurement policies for all types of products (United Nations Environment Programme, 2022, p. 25). In other cases, such as Romania, a national strategy for public procurement guides public entities toward adopting a sustainable approach (Guvernul României, 2023, p. 1-128). Additionally, through Government Decision No. 336, issued in April 2023, twelve types of products were identified as having a negative environmental impact and were required to meet specific ecological criteria, including textile products (Guvernul României, 2023).

This regulation was later supplemented by an order from the President of the National Agency for Public Procurement, which specifies the ecological criteria applicable to textile products (Agenția națională pentru achiziții publice, 2023). Therefore, the focus remains on the environmental dimension of sustainability, while the social aspect is largely overlooked. Notably, the order also addresses the issue of pricing. Since price accounts for 40% of the evaluation criteria

in the bidding process, with the remaining 60% based on ecological characteristics (Agenția națională pentru achiziții publice, 2023), it appears that in the near future, pricing will play a less significant role in contract awards.

However, it is possible that price may not be the decisive criterion at the time of procurement, as specialists recommend conducting life-cycle cost analysis or cost-benefit analysis during the planning phase of procurement (Stroufe, 2018, p. xxii-xxiii). In military structures, this approach is commonly used, particularly in the process of new capabilities development (Gordon & Hinkle, 2011, p. 9-11), but the idea of integrating sustainability encourages decision-makers to consider adopting these practices in other areas as well (Stroufe, 2018, p. 69-121). Military uniform procurement could be one such area.

In this context, military procurement entities face a significant knowledge barrier. On one hand, they must comply with national regulations that promote sustainable practices, while on the other hand, the information available to them is insufficient to fully support the adoption of sustainable uniforms. Despite these challenges, there are some indications of sustainable practices in this area, leading to the research question: What are the key dimensions of sustainable military uniforms?

To address this question, the article has three main objectives: 1) to develop a conceptual framework outlining the sustainable characteristics that textile products should meet; 2) to examine sustainable practices already adopted by military structures in various countries; and 3) to propose key sustainability dimensions for military uniforms. These objectives correspond to three subsections of the article included in the next part, in which research methods like literature review, participant observation and case study are utilized. The expected outcome is to provide military logisticians with a solid foundation for moving toward the

procurement of sustainable uniforms for military personnel. This outcome also represents a key aspect that adds originality to this paper.

2. Exploring the sustainable dimensions of military uniforms

This section is divided into three subsections that align with the stated research objectives. The research approach is exploratory, beginning with a conceptual framework for sustainable textiles and continuing with examples of best practices from military structures in several countries.

2.1. The conceptual framework related to sustainable textiles

The analyzed literature indicates that sustainable requirements for textile products are defined based on the production process, the final products and their accessories, as well as the evaluation of bidders, bids, and contractual clauses (European Commission, 2017, p. 2-33). For clarity and better organization, this review considers these aspects and is structured along three main dimensions of sustainability (Rogers et al., 2008, p. 39): environmental, social, and economic requirements that a sustainable textile product should meet.

From an environmental perspective, researchers have examined the impact of chemical substances used in cultivating crops that provide natural fibres for textile products. To facilitate the recycling of synthetic fibres and reduce environmental pollution, producers are encouraged to ensure that polyester fibres can be easily separated from other materials in the composition. Additionally, they are urged to take back components that cannot be reused, so these materials can be recycled or reintegrated into the manufacturing process (European Commission, 2017, p. 2-33).

Closely related to this requirement, another recommendation should be considered: contractors should establish systems for collecting items that are no longer usable and provide instructions and

training for the personnel using them. Additionally, producers should be required to label products appropriately and offer guidelines for product maintenance (such as washing and ironing). From this perspective, the emphasis is on solutions that minimize energy and water consumption (European Commission, 2017).

Regarding the social dimension, one important aspect is the impact on the end users (European Commission, 2017). In other words, if user feedback is not taken into account, producers may fail to deliver truly sustainable textiles. Additionally, the social impact can include potential health risks, with specific threshold values established for various chemicals with carcinogenic potential, such as Azo dyes and Formaldehyde. Certain substances, like Nonylphenol, Octylphenol, and their corresponding ethoxylates, should be entirely absent from the product composition. Similarly, other substances, including specific dyes and pigments, chlorine bleaches and perfluorooctanoic acid, should not be used during the production process (Agenția națională pentru achiziții publice, 2023).

Another important social aspect is the need to uphold human rights and ensure gender balance among those involved in textile production (European Commission, 2017). These aspects are also addressed in the International Standard OEKO-TEX® MADE IN GREEN, which adds further layers of social sustainability, such as user safety during product use and the requirement for a technological platform that connects producers with raw material suppliers to monitor product traceability (International Association for Research and Testing in the Field of Textile and Leather Ecology, 2023, p. 7-11).

Lastly, the economic dimension is defined by factors such as durability and maintenance frequency, which help reduce the need for frequent procurement (European Commission, 2017). In this context, specific characteristics are closely monitored,

particularly for uniforms, including size stability, fade resistance to washing, perspiration and rubbing (Agenția națională pentru achiziții publice, 2023). To enhance durability, producers could be required to provide a complimentary maintenance kit for a period equal to “*the greater of at least two years from delivery and the duration of the contract*” (European Commission, 2017).

Market availability is a crucial aspect that should be considered within both the economic and social spheres. This factor is emphasized by the need to share information about the intention to purchase sustainable textiles with producers, allowing them time to adjust their offerings and plan their workforce accordingly. It is also essential for public procurers to collaborate with producers to develop feasible and realistic requirements that do not jeopardize producers’ economic stability or buyers’ ability to meet their needs (European Commission, 2017). To support new economic operators to adopt sustainable production, a recommended measure is to implement a transition period during which non-compliance with sustainability requirements is temporarily accepted (European Commission, 2017). This approach positively impacts both economic and social dimensions while creating conditions for a gradual shift toward environmental and social solutions, ultimately contributing to overall sustainability.

As it can be easily noticed, much of the responsibility for sustainable textiles falls on the producers. Given the broad range of measures presented so far, it has been recommended that public entities shift from procuring textiles as products to procuring them as a service (European Commission, 2017). Furthermore, the review emphasizes that actions taken in one dimension of sustainability can impact the others. Therefore, to truly achieve access to sustainable textiles, it is crucial to address the requirements specific to each of the three dimensions.

Another widely debated issue regarding military uniforms is the use of

smart materials in their manufacturing. But here, things are not very clear. On one hand, there is the disadvantage of increased waste generation, while on the other, there are benefits like ease of recycling (Ojstršek et al., 2022, p. 1-2). Additionally, factors such as the short lifespan of these materials due to difficulties in maintaining electrical conductivity after being washed and worn, the uncertainty surrounding the total costs of production and use, and the carcinogenic potential of these fabrics (Ojstršek et al., 2022, p. 2-20) are significant concerns. These issues may provide sufficient reasons to reconsider the inclusion of smart fabrics as a viable component of sustainable military uniforms.

In this context, using fabrics made from natural raw materials, such as cotton treated with plant-extracted bio-macromolecules, appears to be the most sustainable alternative. Advantages of this approach include a reduced need for chemicals in various treatments (such as fireproofing) and a lower degree of discolouration in khaki fabric (Basak & Ali, 2016, p. 3-16). However, admitting that cotton on its own has limited resistance to washing (Basak & Ali, 2016, p. 27), it could be considered that combining it with synthetic substances could enhance its durability and contribute more effectively to achieving sustainability.

2.2. Sustainable practices adopted in military uniforms provision

In addition to meeting the wide range of sustainability criteria outlined in the previous section for textiles, military uniforms must also address a distinct set of requirements driven by operational needs (Totala et al., 2020, p. 35). Therefore, the challenge of creating sustainable uniforms is even greater. For this reason, before defining the sustainability dimensions of military uniforms, this study examines examples of best practices from the armed forces of several countries, including the Netherlands, Germany, Portugal, Canada and Romania. It is important to note that

this study is limited by the fact that other relevant cases may exist, but information on them is not publicly accessible.

A compelling example that demonstrates the benefits of such measures comes from the Dutch Ministry of Defence. In 2017, they implemented a system within the department responsible for centralized procurement of individual equipment, focused on recovering products that can be recycled, repaired or upgraded. This initiative generates an additional income of 750,000 euros annually and reduces the annual carbon footprint by 14,500 tons, benefiting a workforce of 60,000 soldiers (European Defence Agency, 2020, p. 29-33). This measure not only has the potential to create economies of scale, but the savings could also be redirected toward other social, environmental or operational goals.

Another example from the same country involves the integration of circular economy technologies to extend the lifespan of products, as highlighted in an interview with Florika Fink-Hooijer,

Director-General of the European Commission (European Defence Agency, 2020, p. 29-33). In the same interview, it was suggested that reverse logistics could be a valuable tool for implementing the circular economy model in defence, particularly in uniform supply, as well as in remanufacturing and repair processes. The official also emphasized the importance of collaboration with the private sector to identify both opportunities and challenges related to this initiative, fostering an inclusive transition (European Defence Agency, 2020, p. 29-33).

The next case, involving the Romanian armed forces, was analyzed using a combination of two research methods: literature review and participant observation. This analysis revealed that the military structure responsible for centralized procurement has adopted OEKO-TEX certification for purchasing battle dress uniforms (BDUs), as evidenced by the information printed on product labels (jacket and pants), shown in Figure no. 1.

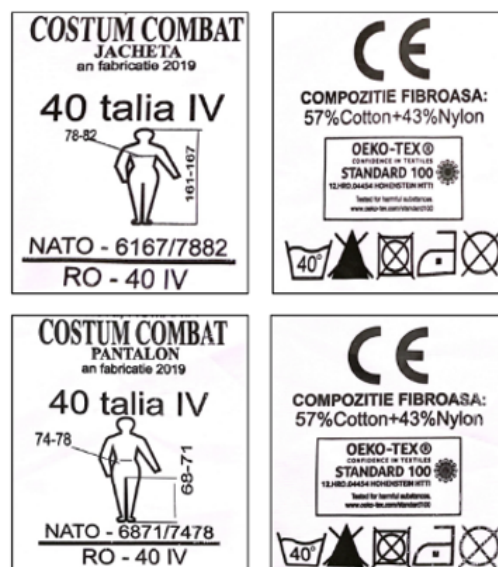


Figure no. 1: *The label certifying the adoption of OEKO-TEX STANDARD 100, in the Romanian armed forces*

The link between this certification and the concept of sustainable military uniforms becomes clear through an analysis of its significance. The OEKO-TEX label

signifies compliance with STANDARD 100, which ensures that every component, from fabric to accessories like zippers, laces, buttons, prints and badges, has been

tested for safety and is free from harmful substances, protecting the health of the wearer (International Association for Research and Testing in the Field of Textile and Leather Ecology, 2023, p. 14). This standard can also be applied to other elements of military uniforms, whether they come into direct contact with skin or not, such as blouses, t-shirts, underwear, jackets, vests, and belts. (International Association for Research and Testing in the Field of Textile and Leather Ecology, 2023, p. 7-8).

In these cases, the OEKO-TEX label was not found on the uniforms' tags, indicating there is significant potential to improve health conditions for military personnel. Additionally, while textile components of leather or fur products can receive this certification, the standard does not apply to items made primarily of leather or fur. For such products, the OEKO-TEX® LEATHER STANDARD is used (International Association for Research and Testing in the Field of Textile and Leather Ecology, 2023, p. 9). In the case of the Romanian armed forces, military footwear does not feature this label, indicating that the specific OEKO-TEX standard has not been adopted for these items.

However, the adopted standard does not fully address all three dimensions of sustainability, as it does not provide direct environmental benefits. For this reason, as mentioned in the section on the conceptual framework, the OEKO-TEX® MADE IN GREEN standard is being considered. Since the first step in implementing OEKO-TEX® MADE IN GREEN involves adopting OEKO-TEX STANDARD 100 (International Association for Research and Testing in the Field of Textile and Leather Ecology, 2023), it can be said that the Romanian armed forces have initiated the process of integrating sustainability. However, much remains to be done, including addressing all types of military uniforms, their components, and progressing through the necessary stages.

Additionally, if a product is to contain certified organic cotton, the OEKO-TEX® ORGANIC COTTON standard must be implemented. It is important to note that if the organic cotton content is less than 70% of the total fibre composition, certification falls under OEKO-TEX® STANDARD 100, while percentages of 70% or higher qualify for certification under OEKO-TEX® ORGANIC COTTON (International Association for Research and Testing in the Field of Textile and Leather Ecology, 2023, p. 5). Since the cotton content in the combat uniform provided by the Romanian military is only 57%, it cannot be certified under the OEKO-TEX® ORGANIC COTTON standard unless the cotton percentage is increased and sourced organically.

Another key insight from analyzing the labels is that a fabric does not need to be made from organic raw materials to be considered sustainable, as this is not a requirement in the implementation of the OEKO-TEX® MADE IN GREEN standard. However, the health benefits for the wearer, such as the fact that fabrics made predominantly from organic cotton contain less than 10% genetically modified organisms and are tested for pesticide levels (International Association for Research and Testing in the Field of Textile and Leather Ecology, 2023, p. 29), may lead to the recommendation that the cotton used in sustainable military uniforms be of organic origin.

Additional examples of sustainable military uniform practices come from the armed forces of Germany and Portugal. While the literature confirms that military management in these countries prioritizes sustainability in line with the European Commission's framework, specific details on how these initiatives are implemented are not provided. Some innovative solutions that focus on benefits for the end user include: adding multiple functionalities to combat uniforms (such as ballistic protection and defence against chemical, biological, radiological, and nuclear/CBRN attacks), providing maintenance kits for uniforms

during foreign deployments, donating military products, returning uniforms for reuse (e.g., for camouflage nets), repurposing camouflage uniforms for non-operational uses, extracting reusable materials, and accessing EU funding mechanisms for sustainability projects (Reis et al., 2022, p. 9-12).

Another key requirement for sustainable military uniforms, highlighted during the Russian-Ukrainian war, is the incorporation of multiple functionalities. For example, one important function is providing active protection against CBRN agents, marking a shift from traditional passive protective gear. A significant factor enhancing the sustainability of military uniforms is their ability to neutralize harmful substances upon contact. This effect is made possible through the use of nanoparticle-based technology, which is compatible with fabrics made from natural raw materials (Araújo et al., 2021, p. 1123-1138).

Additional potential operational advantages are evident in the Canadian armed forces' initiative, which aim to develop integrated uniforms by 2025 through collaboration between public authorities, academia, and the defence industry. This project focuses on addressing human factors such as mobility, survivability, and tactical sustainability, while integrating weapons, command, control, communications, computers, and information (C4I) systems, along with multiple sensors, to enhance operational performance. However, in this context, "sustainability" refers not to sustainable development goals, but rather to "*the period during which the system remains effective on the battlefield*" (Government of Canada, 2015, p. 7-286).

The operational benefits associated with sustainability include supporting vital functions, enabling combat readiness, providing necessary consumables for system

operation (such as energy, munitions, spare parts, and decontamination substances), offering first aid, resilience against toxic substance attacks, minimizing stress effects, and facilitating training opportunities (Government of Canada, 2015, p. 7-286). While these multiple benefits should be embraced by the soldiers, it appears that the end user has been reluctant to adopt the integrated uniform (Government of Canada, 2015, p. 7-286). When combined with the lack of information about its environmentally protective features, it can be considered that the social and environmental dimensions of sustainability were overlooked in this case.

2.3. Findings related to sustainability dimensions of military uniforms

In formulating relevant conclusions about the characteristics that provide sustainable dimensions to military uniforms, it is essential to consider the premise that integrating sustainability in line with sustainable development principles should not compromise the ability of armed forces to carry out their missions. This approach is rooted in recommendations from experts on sustainability integration (Stroufe, 2018, p. 78). Therefore, from a military perspective, sustainable uniforms should offer economic, social and environmental benefits while still maintaining operational effectiveness. Although this concept is straightforward in theory, implementing it is more complex, as the analysis of best practices reveals numerous operational requirements that often conflict with sustainability goals.

Based on the analysis conducted, Table no. 1 provides a comprehensive overview of the measures that can be implemented and the characteristics that contribute to making military uniforms sustainable.

Table no. 1

Measures/characteristics for sustainable military uniforms

<i>Measures/characteristics</i>	<i>Sustainability dimensions</i>			
	<i>Economic</i>	<i>Social</i>	<i>Environmental</i>	<i>Operational</i>
Centralized procurement	↔			
Reusable materials	←		→	
System for collecting the used uniform components	←		→	
Low energy and water maintenance solutions	↔		↔	↔
End users' acceptance	←			→
Impact on end users' health		↔		↔
Increased durability	←			→
Market availability (cooperation and support for producers)	←			→
Transition period	↔			
Natural, organic fibres		↔		
Produced respecting the human rights and gender balance		↔		
Raw materials traceability		↔		
Certifying labels	←		→	
Recyclable synthetic fibres	↔	↔	↔	↔
Maintenance set of tools	↔		←	→
Nanoparticle-based technology	←			→
Accessing EU funding instruments	←			→

Given that all four dimensions must be addressed to achieve truly sustainable military uniforms, specialists should focus on implementing as many measures outlined in Table 1 as possible, simultaneously. A truly sustainable uniform should incorporate the characteristics and be manufactured or supplied with consideration for the four sustainability dimensions: economic, social, environmental, and operational. However, the operational dimension may be less critical for non-BDU types of military uniforms that are not used during exercises, crisis response, or other operational activities. In these cases, implementing sustainability should be prioritized.

3. Conclusions

This study provided a comprehensive overview of the sustainable dimensions applicable to military uniforms. The main

conclusion is that delivering sustainable military uniforms is a significant challenge, not only for logisticians but also for manufacturers. This challenge arises from several factors: supporting and collaborating with producers to identify the best sustainable alternatives and ensure market availability; incorporating a broad range of sustainable features into technical specifications; revising contract value estimation methods with a focus on cost analysis; understanding the perceptions and acceptance of end users; adopting nanoparticle-based technologies; ensuring durability and establishing systems for collecting used items; and accessing EU funding mechanisms, among others.

To address this challenge, military specialists should distinguish between current and future types of military uniforms, military structures and mission

requirements, and gradually implement the sustainable characteristics identified in this study. Additionally, while incorporating multiple functionalities into combat uniforms can address a wide range of protective needs on the battlefield, logisticians must avoid solutions that compromise soldiers' health. Therefore, integrating multiple functions into combat uniforms should consider that these uniforms are often worn during peacetime activities, such as office activities. The decision to address numerous threats must be balanced against the potential impact on wearers, including their morale, acceptability and health. In line with this, all uniform components should be clearly labelled with certifications that ensure the products are safe for wear, contribute to environmental protection, offer maintenance instructions and reduce the need for frequent replacements.

Another key measure to meet these requirements is placing greater emphasis on experimental studies and making their results publicly accessible. To enhance the success of future efforts in integrating sustainability into military uniforms, more detailed information on best practices should be shared with the broader public. This transparency would allow the academic community, economic operators, and military logisticians to contribute more effectively to advancing the vision of sustainability.

Moreover, addressing military requirements should not be viewed in isolation from meeting soldiers' basic needs, protecting the environment, and supporting vulnerable communities. These are critical reasons to shift the current paradigm in military uniform provision. To achieve this effect, several steps should be prioritized:

- training the military logisticians with respect to sustainability benefits;
- organizing working groups with specialists involved in defining the characteristics of military uniforms and engaging private actors along the supply chain, to identify feasible solutions that

meet the requirements specific to each of the four analyzed dimensions;

- making the outcomes of these meetings publicly accessible to all interested parties, to ensure equal treatment for all potential suppliers;
- conducting life-cycle cost analysis and cost-benefit analysis for each item of the military uniforms, taking into account the sustainable characteristics identified as feasible in the previous step and the possibility to involve suppliers until products reach their life span and components are being recovered for a new production cycle;
- supporting (funding) the creation a prototype model;
- testing the products with military end users, gathering their feedback and refining the production process until the final products meet as many sustainability expectations as possible;
- initiating and conducting the procurement process (which includes: establishing sustainable requirements for production processes, final products, accessories, and setting sustainable evaluation criteria for bidders, bids, and contractual clauses);
- assessing the sustainability of the products provided by contractors;
- establishing internal procedures related to reverse logistics practices;
- sharing best practices.

In conclusion, implementing these prioritized steps will ensure a comprehensive approach to developing sustainable military uniforms. By involving specialists, industry partners, and end users throughout the process, and by emphasizing transparency, cost-effectiveness, and reverse logistics, the initiative fosters a responsible and efficient supply chain. This collaborative effort not only enhances the quality and sustainability of the military uniforms but also establishes a model for best practices that can be applied to other procurement processes, reinforcing a commitment to sustainability and innovation within military logistics.

Acknowledgements

This article is dedicated to advancing the discourse in the field of sustainable military uniforms, building on the available limited public information from the military field and the conceptual parts specific to sustainable textiles.

REFERENCES

Agenția națională pentru achiziții publice. (2023). *Ordinul nr. 2.395 pentru aprobarea criteriilor ecologice aplicabile categoriilor de produse care au impact asupra mediului pe durata întregului ciclu de viață*. *Monitorul Oficial nr. 2 din 3 ianuarie 2024*. Available at: <https://legislatie.just.ro/Public/DetaliiDocument/277893>, accessed on July 5, 2024.

Araújo et al. (2021). In-situ synthesis of CaO and SiO₂ nanoparticles onto jute fabrics: exploring the multifunctionality. *Cellulose, Vol. 28*, 1123-1138. Available at: <https://doi.org/10.1007/s10570-020-03564-1>, accessed on September 9, 2024.

Basak, S., & Ali, S.W. (2016). Sustainable fire retardancy of textiles using bi-macromolecules. *Polymer Degradation and Stability, Vol. 133*, 47-64. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S014139101630223>, accessed on July 12, 2024.

Council of the European Union. (2022). *A Strategic Compass for Security and Defence - For a European Union that protects its citizens, values and interests and contributes to international peace and security*. Brussels. Available at: https://www.eeas.europa.eu/sites/default/files/documents/strategic_compass_en3_web.pdf, accessed on July 10, 2024.

European Commission. (2017). *EU green public procurement criteria for textiles products and services, SWD (2017) 231*. Bruxelles. Available at: https://green-business.ec.europa.eu/green-public-procurement/gpp-criteria-and-requirements_en, accessed on September 3, 2024.

European Defence Agency. (2020). *Advancing Circular Economy in Defence. European Defence Matters, Vol. 20*, 1-44. Available at: <https://eda.europa.eu/docs/default-source/eda-magazine/edm20-magazine.pdf>, accessed on July 2, 2024.

European Parliament. (2023). *Strategia UE pentru textile sustenabile si circulare*. Bruxelles. Available at: https://www.europarl.europa.eu/doceo/document/TA-9-2023-0215_RO.pdf.

European Parliament. (2024, March 21). *The impact of textile production and waste on the environment (infographics)*. Available at: <https://www.europarl.europa.eu/topics/en/article/20201208STO93327/the-impact-of-textile-production-and-waste-on-the-environment-infographics>.

Gordon, V.C., & Hinkle, W.P. (2011). *Best Practices in Defence Resource Management*. Alexandria: Institute for Defense Analyses. Available at: <https://apps.dtic.mil/sti/pdfs/ADA541650.pdf>, accessed on July 11, 2024.

Government of Canada. (2015). *Capstone Report and Action Plan. Supporting the Future Soldier. Supporting the Canadian Industry. Soldier Systems Technology Roadmap*. Available at: https://www.defenceandsecurity.ca/UserFiles/File/pubs/capstone_e_05_high_quality-%233243236-v1-OTT_LSTL.PDF, accessed on July 7, 2024.

Guvernul României. (2023). *Hotărârea nr. 336 din 12 aprilie 2023 pentru modificarea și completarea Normelor metodologice de aplicare a prevederilor referitoare la atribuirea contractului sectorial/acordului-cadru din Legea nr. 99/2016 privind achizițiile sect.* Available at: <https://anap.gov.ro/web/wp-content/uploads/2023/04/HOTARARE-nr.-336-din-12-aprilie-2023.pdf>, accessed on July 21, 2024.

Guvernul României. (2023). *Strategia Națională în domeniul achizițiilor publice 2023-2027*. Available at: <https://sgg.gov.ro/1/wp-content/uploads/2023/06/ANEXA-STRATEGIA.pdf>, accessed on September 5, 2024.

International Association for Research and Testing in the Field of Textile and Leather Ecology. (2023). *Standard OEKO-TEX® MADE IN GREEN, Second Edition*. Available at: https://www.oeko-tex.com/importedmedia/downloadfiles/OEKO-TEX_MADE_IN_GREEN_Standard_EN_DE.pdf, accessed on July 4, 2024.

International Association for Research and Testing in the Field of Textile and Leather Ecology. (2023). *Standard OEKO-TEX® ORGANIC COTTON, Second Edition*. Available at: https://www.oeko-tex.com/importedmedia/downloadfiles/OrganicCottonStandard_02.2023_en_de.pdf, accessed on July 5, 2024.

International Association for Research and Testing in the Field of Textile and Leather Ecology. (2023). *Standard OEKO-TEX® STANDARD 100, Second Edition*. Available at: <https://www.oeko-tex.com/importedmedia/downloadfiles/OTS100S>, accessed on July 10, 2024.

Kostadinova. (2016). Sustainable Consumer Behaviour: Literature Review. *Economic Alternatives, Vol. 2*, 224-234. Available at: https://www.researchgate.net/publication/299681081_Sustainable_consumer_behaviour_a_literature, accessed on July 14, 2024.

North Atlantic Treaty Organization. (2022, June 29). *NATO 2022 Strategic Concept*. Available at: <https://www.nato.int/strategic-concept/>, accessed on July 10, 2024.

Ojstršek et al. (2022). A Review of Electro Conductive Textiles Utilizing the Dip-Coating Technique: Their Functionality, Durability and Sustainability. *Polymers, Vol. 14* (21: 4713). Available at: <https://www.mdpi.com/2073-4360>, accessed on July 21, 2024.

Quoquab & Mohammad. (2020). A review of Sustainable Consumption (2000 to 2020): What We Know and What We Need to Know. *Journal of Global Marketing, Vol. 33, Issue 5*, 305-334. Available at: <https://www.tandfonline.com/doi/full/10.1080/08911762.2020.1811441>, accessed on September 10, 2024.