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EMBRACING SUSTAINABILITY IN MILITARY MANAGEMENT: CHALLENGES AND OPPORTUNITIES

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Abstract: *This paper explores the integration of sustainable management practices into military operations. While numerous benefits are associated with sustainability, such as resource conservation and cost reduction, significant challenges also exist. The research is based on a bibliometric analysis of scientific literature on sustainable management practices. It explores the latest developments, ongoing trends, and areas needing further study. The analysis is based on 1818 articles retrieved from the Web of Science (WoS) platform. The data was processed and visualized using VOSviewer software. The study reveals a significant increase in publications on organizational sustainability, highlighting its growing importance.*

Keywords: sustainability, strategy, military, organization

1. Introduction

Sustainable management practices encompass a range of strategies aimed at integrating environmental, social, and economic considerations into business operations. These practices include green supply chain management, lean and visual management in facilities, sustainable agriculture practices, and sustainable project management. Green supply chain management involves environmentally sustainable practices in response to customer demand and regulatory requirements [1]. Lean and visual management in facilities contribute to improved customer expectations, waste reduction, and the implementation of sustainable practices like recycling [2]. Sustainable agriculture practices focus on sustainable plant, soil, and water management to prevent land degradation and enhance productivity [3]. Sustainable project management ensures that projects are controlled to achieve sustainability goals [4]. While there are numerous opportunities associated with sustainable management practices, such as improved resource allocation, enhanced customer satisfaction, and long-term environmental benefits, there are also challenges that organizations face. One significant difficulty is the recruitment of talented management professionals for sustainable ventures [5]. This challenge stems from a lack of empirical research and insights into attracting skilled individuals to sustainable initiatives. Additionally, difficulties in achieving sustainability outcomes in project management are often encountered due to various obstacles experienced during project implementation [6]. Despite the potential benefits, these difficulties can create roadblocks to effectively incorporating sustainability into project management. Sustainable management practices act as a key tool, empowering organizations to bridge the gap between environmental and social responsibility,

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fostering a more holistic approach, while ensuring long-term economic viability. However, challenges such as talent acquisition and overcoming implementation barriers can impede the effective adoption of sustainable practices. By addressing these difficulties and leveraging the opportunities presented by sustainable management practices, organizations can enhance their overall performance and contribute to a more sustainable future.

2. Sustainable Management Practices Gaps

Sustainable management practices are essential for environmental protection, social responsibility, and economic viability. However, gaps exist in their implementation and understanding. One significant gap is the knowledge and behavioral aspects of stakeholders involved in sustainable practices. Research has identified discrepancies between farmers' knowledge of sustainable agricultural practices and their on-farm implementation. Regarding the variables influencing farmers' adoption of sustainable agricultural practices, there is a significant knowledge gap. This underscores the need to investigate farmers' propensity to implement sustainable approaches aligned with Good Agricultural Practices (GAP) [7]. Furthermore, there is a gap in integrating sustainability into organizational strategies and management control systems. Empirical studies underscore the significance of integrating sustainability into organisational strategies through the configuration of management control systems. They also highlight the functions and applications of sustainability control systems and management control systems in accomplishing this integration. [8]. Additionally, there is a competence gap among project managers concerning sustainability, indicating a need to enhance their competencies in sustainable practices [9]. A critical research gap persists in comprehensively elucidating the impact of efficient resource management practices on sustainable performance. Research has indicated the need for more studies in this area by proposing theoretical frameworks to close this gap and improve sustainable performance through effective resource management techniques [10].

A comprehensive approach to sustainable management necessitates the elimination of critical knowledge gaps among stakeholders, seamless integration of sustainability principles within organizational strategies, development of robust project management competencies, and a thorough understanding of resource management's impact on sustainable performance. By addressing these lacunae, organizations can forge a path towards long-term environmental, social, and economic sustainability.

In order to emphasize the gaps in recent scientific literature an bibliometric analysis was performed based on the keywords "sustainable management", "sustainable management practices", "organizational sustainable practices". The time span was the last 10 years and the scan was performed in the Web of Science collection database. VOSviewer software was utilized for the bibliometric analysis of the included articles. Bibliometric analysis of 1,818 publications on sustainable management practices identified "relationship" as the most frequent keyword, boasting a total link strength of 2,711.

This prominence underscores the emphasis on interconnectedness between sustainable practices and concepts like "system," "circular economy," and "sustainable development goals. With regard of the main research areas Environmental Sciences and Ecology has the highest number of articles (874), followed by Engineering (580) and Business Economics (46).

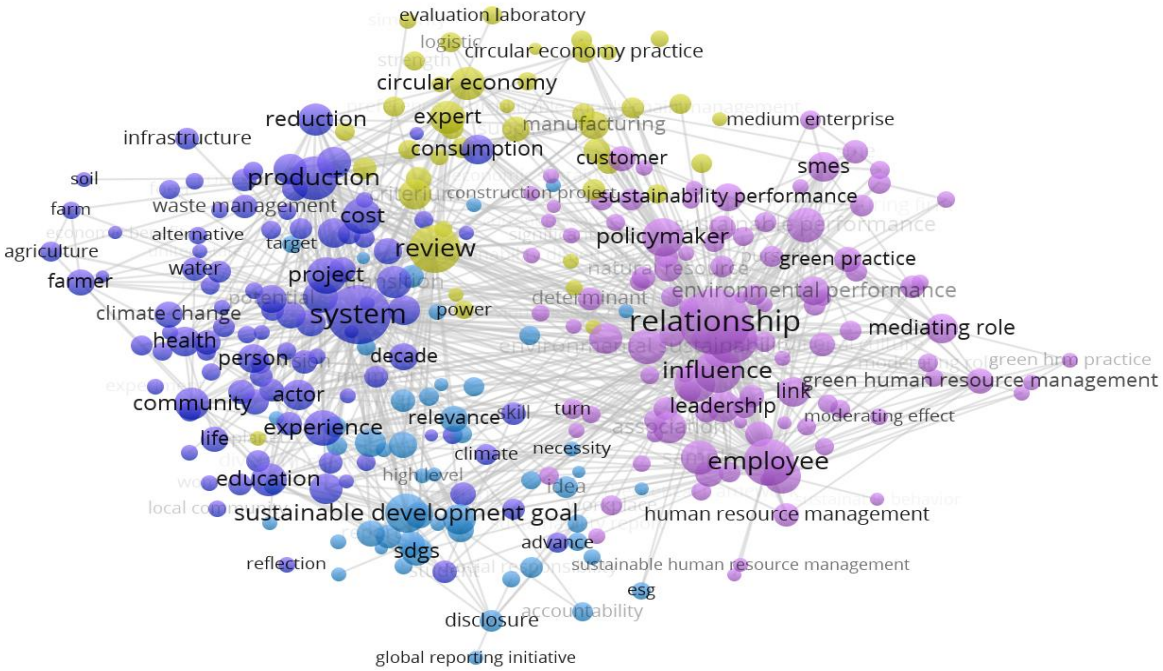

Figure 1: Bibliometric analysis of themes
Source: own creation in vosviewer

Extrapolating from current publication growth patterns, we can anticipate a substantial upswing in scholarly output dedicated to sustainable management practices on a global scale. Our comprehension and utilisation of these crucial tactics could be profoundly altered by the growing corpus of research. England made the most outstanding contribution within this important field followed by India, USA and China.

Table 1 Number of publications in coauthorship

	Countries/Regions	Record Count	% of 1,818
1	ENGLAND	220	12
2	INDIA	212	12
3	USA	207	11
4	PEOPLES R CHINA	166	9
5	SPAIN	134	7
6	AUSTRALIA	132	7
7	ITALY	121	7
8	BRAZIL	110	6
9	GERMANY	84	5
10	CANADA	83	5

Research institutions published articles in academic journals to share research findings related to the SDGs. This informs policymakers and helps develop effective strategies for achieving the goals. The articles analysed are focused on basic human needs such as poverty reduction, hunger, health, education, and clean energy. Distribution analysis of the publishing venues for the 1818 articles revealed a high degree of thematic heterogeneity. A total of 663 unique journals were identified, with 25% contributing only a single publication to the dataset. This finding suggests a

limited thematic alignment with the core research focus on sustainable management for a significant portion of the source pool. Similarly, 6% and 2% of the journals published only two and three articles, respectively. Conversely, 59% of the journals disseminated four or more articles, potentially indicating a thematic focus on sustainability or management within their editorial scope. In light of these considerations, the research topic emerges as inherently cross-disciplinary, amenable to publication in various academic journals across distinct fields and methodological approaches.

The research confirms a significant and ongoing growth in scientific literature focused on sustainability within the management domain.

Keyword trend analysis indicates a growing recognition of sustainability as a strategic approach within management.

The study suggests that this subfield of sustainability research holds considerable potential for continued significant growth.

3. Sustainability Management Strategies in Military Organizations

Military organizations face challenges in implementing sustainable practices due to the need for fundamental change in their strategies.

These challenges include combining economic, social, and environmental aspects effectively, as well as barriers like high material costs, lack of knowledge, insufficient training, and government policies [11].

Despite initiatives to improve sustainable management in military units, they are still limited. To overcome these challenges, military organizations can follow a four-step process to implement a sustainability strategy, focus on projects for constructions, water resource management, and decision-making tools, and increase knowledge and training on sustainable practices. Additionally, addressing the high costs of materials and advocating for supportive government policies can help in the widespread adoption of sustainable practices in military organizations.

Some of the difficulties encountered in sustainable management practices are related to short-term vs. long-term focus.

Decisions that negatively impact the environment or society can result from organisations prioritising short-term profits over long-term sustainability goals. Another problem is the lack of integration of sustainability practices. These are often seen as separate from core business functions, leading to a siloed approach. Integrating sustainability into all levels of management is crucial.

Difficulties exist in accurately measuring and reporting on the impact of sustainability initiatives. This makes it hard to track progress and justify investments. Also without strong leadership buy-in, sustainability efforts struggle to gain traction.

Leaders need to champion sustainability and hold all levels accountable.

Employees need to understand the importance of sustainability and how their actions contribute. Training and incentives can foster a culture of sustainability within the organization.

Figure 2: Integrative Framework for Analyzing Corporate Sustainability Drivers
Source: author's conceptualization

A sustainable strategy is a roadmap that outlines an organization's long-term plan for achieving economic success, environmental responsibility, and social well-being. It essentially integrates these three pillars of sustainability into core business functions and decision-making processes.

Sustainability management goals encompass a variety of objectives that organizations strive for to minimize their environmental impact, maximize social well-being, and ensure long-term economic viability.

Building a culture of sustainability requires ongoing effort from leadership. Leaders must champion sustainability by setting clear goals, providing resources, and creating a supportive environment for employees to contribute.

The sustainability culture must be based on collaboration, transparency and innovation. Open communication and teamwork are essential for achieving continuous improvement on sustainability.

There's an ongoing commitment to learning about best practices and emerging trends in sustainability. This is why the strategy must be continuously discuss and regular monitoring of progress must be done through various methods.

Specific strategies adopted by a military organization will depend on various factors, including budget constraints, national priorities, and the specific environmental and social context of its operations. However, the trend towards incorporating sustainability into military operations is clear, driven by a combination of environmental responsibility, economic efficiency, and social well-being considerations.

Additionally, international cooperation on sustainable military practices is growing. This highlights the increasing recognition of the global nature of environmental challenges and the potential for collaboration between militaries to share best practices and develop innovative solutions.

4. Conclusions

The identified challenges in embracing sustainability in military management strongly highlight the necessity for re-evaluating operational priorities, resource allocation, and decision-making frameworks to integrate sustainability principles effectively within the military organizations. To achieve this, fostering a culture of environmental responsibility, updating policies and procedures, and investing in training programs to equip

personnel with the necessary skills and mindset for sustainable practices, are crucial steps.

Successful sustainable management practices have been identified across various fields. For instance, in manufacturing, sustainable practices such as end-of-life practices focusing on material recovery through reuse, remanufacturing, or recycling have shown positive impacts on sustainability performance [8]. In agriculture, the adoption of sustainable agricultural practices (SAPs) has been crucial in addressing issues like land degradation, low agricultural productivity, and poverty in regions like sub-Saharan Africa [12]. Moreover, in construction engineering projects, integrating sustainability into project planning has been highlighted as a leading practice to achieve effective and successful sustainable project management throughout the project life cycle [4]. Research indicates that manufacturing firms can gain a competitive edge by implementing sustainable operations management practices, which reduce operating costs, improve employee satisfaction, and improve the environment. [13]. Additionally, the importance of managers in advancing environmentally friendly practices has been highlighted. Ascribed responsibility, waste control, and green self-efficacy all play important roles in encouraging environmentally friendly practices inside businesses [14]. Human competencies have been identified as crucial factors predicting the success of sustainable strategic management within organizations ("Uncovering the human competencies that drive sustainable strategic management", 2019). Facilities managers have been identified as a critical player in driving the built environment's sustainability agenda, and adopting sustainable practices is one of the most important issues surrounding facilities management [15]. Additionally, integrating sustainability into construction project management practices in developing countries has been identified as a critical success factor for ensuring sustainable outcomes [16]. Overall, the synthesis of these references underscores the importance of adopting and integrating sustainable practices across various sectors to achieve success in sustainability performance, competitive advantage, and overall organizational performance. Emphasizing factors such as end-of-life practices, sustainable agricultural practices, project planning, operations management, and human competencies can contribute significantly to the successful implementation of sustainable management practices.

Embracing sustainability is vital also for military organizations, ensuring resource availability for training and operations while reducing risks, enhancing readiness, and decreasing environmental footprints.

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