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Supply Chain Management

Postgraduate Dissertation
“Greek public sector and sustainability: Logistical
Perspective”

Konstantinos Baladakis

Supervisor: Michael Geranios

Patra, Greece, June 2023

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“Greek public sector and sustainability: Logistical Perspective”

Konstantinos Baladakis

Supervising Committee

Supervisor:

Michail Geranios

Adjunct Professor

PhD holder in Operations and Supply Chain
Management from the University of
Aegean

Co-Supervisor:

Alexandros Diamantidis

Assistant Professor in Quantitative
Methods in Management at the School of
Economics of Aristotle University of
Thessaloniki.

Patra, Greece, June 2023

Abstract

This dissertation focuses on sustainability in the Greek public sector as a logistical issue. It provides an overall literature review examining the current position, challenges and opportunity for incorporating sustainability in public sector logistics. The study explores organizational structure and functions of the Greek public sector, major issues facing public sector logistics, recent reforms, and initiatives along with impacts of EU policies. It further studies the evolution and status of sustainability in the Greek public sector, legal and regulatory framework, case studies of sustainability practices along with public perception and awareness. In addition to that, it explores logistics management and its importance, challenges and opportunities in public sector logistics, case studies of effective logistics management, along with impacts from global trends. Lastly, this study examines the role of sustainability certainly in public sector logistics and learns best practices from around the world, lessons for Greece for each specific topic along with conducting a comparative analysis between Greece and other countries. Finally, the dissertation discusses the perspective possibility and challenges sustainable logistics in the Greek public sector along with providing policy recommendations for future research.

Keywords: sustainability, Greek public sector, logistics, organizational structure, challenges, reforms, EU policies, legal framework, case studies, public perception, logistics management, global trends, best practices, comparative analysis, policy recommendations, future research.

Περίληψη

Η παρούσα διατριβή επικεντρώνεται στη βιωσιμότητα του ελληνικού δημόσιου τομέα ως υλικοτεχνικό ζήτημα. Παρέχει μια συνολική βιβλιογραφική ανασκόπηση που εξετάζει την τρέχουσα θέση, τις προκλήσεις και τις ευκαιρίες για την ενσωμάτωση της βιωσιμότητας στην εφοδιαστική του δημόσιου τομέα. Η μελέτη διερευνά την οργανωτική δομή και τις λειτουργίες του ελληνικού δημόσιου τομέα, σημαντικά ζητήματα που αντιμετωπίζει η εφοδιαστική του δημόσιου τομέα, τις πρόσφατες μεταρρυθμίσεις και πρωτοβουλίες μαζί με τις επιπτώσεις των πολιτικών της ΕΕ. Μελετά περαιτέρω την εξέλιξη και την κατάσταση της βιωσιμότητας στον ελληνικό δημόσιο τομέα, το νομικό και κανονιστικό πλαίσιο, μελέτες περιπτώσεων πρακτικών βιωσιμότητας καθώς και την αντίληψη και ευαισθητοποίηση του κοινού. Επιπλέον, διερευνά τη διαχείριση εφοδιαστικής και τη σημασία της, τις προκλήσεις και τις ευκαιρίες στην εφοδιαστική του δημόσιου τομέα, μελέτες περιπτώσεων αποτελεσματικής διαχείρισης εφοδιαστικής, μαζί με τις επιπτώσεις από τις παγκόσμιες τάσεις. Τέλος, αυτή η μελέτη εξετάζει τον ρόλο της βιωσιμότητας σίγουρα στην εφοδιαστική του δημόσιου τομέα και μαθαίνει βέλτιστες πρακτικές από όλο τον κόσμο, μαθήματα για την Ελλάδα για κάθε συγκεκριμένο θέμα μαζί με τη διεξαγωγή συγκριτικής ανάλυσης μεταξύ της Ελλάδας και άλλων χωρών. Τέλος, η διατριβή συζητά την προοπτική, τη δυνατότητα και τις προκλήσεις της βιώσιμης εφοδιαστικής στον ελληνικό δημόσιο τομέα μαζί με την παροχή συστάσεων πολιτικής για μελλοντική έρευνα.

Λέξεις-Κλειδιά:

βιωσιμότητα, ελληνικός δημόσιος τομέας, logistics, οργανωτική δομή, προκλήσεις, μεταρρυθμίσεις, πολιτικές της ΕΕ, νομικό πλαίσιο, μελέτες περιπτώσεων, αντίληψη του κοινού, διαχείριση logistics, παγκόσμιες τάσεις, βέλτιστες πρακτικές, συγκριτική ανάλυση, συστάσεις πολιτικής, μελλοντική έρευνα.

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List of Abbreviations

EU - European Union

GDP - Gross Domestic Product

IoT - Internet of Things

NGO - Non-Governmental Organization

UNCTAD - United Nations Conference on Trade and Development

IoT - Internet of Things

NGO - Non-Governmental Organization

EU - European Union

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1. Introduction

1.1 Research Background

The twentieth century marked the advent of sustainability as a critical theme in different sectors across the globe. More than ever, sustainability is drawing more attention in the public and private sectors given its influence on economic, environmental, and social development factors (United Nations, 2015). Specifically, the sustainability dimension in the public sector has gained immense prominence owing to the sector's vital function in setting the course for national development and its influence on private sector actions (Agrawal & Singh, 2015).

Saliently, likewise, the Greek public sector has been undergoing transformation endeavors with an emphasis on enhancing sustainability (European Commission, 2020). Generally, such endeavors have presented numerous challenges which are linked inconceivably with its bureaucratic structure, fiscal constraints, and the aftermath of the financial crisis (Featherstone, 2011). These challenges are still magnified when viewed from a logistical point of view in that logistics are seen to form the backbone of public sector operations (Bovis, 2012). The imperative need for efficient and sustainable logistical operations further fosters desires for reform since growing pressure on public services amidst strained conditions of the economy does exist.

Greece being a part of the European Union (EU) is deeply obliged to sustain the EU's sustainability agenda (European Commission, 2018). The EU push for a circular economy with sustainable practices presents both opportunities and limitations on the Greek Public Sector. To be precise, it provides an impetus toward reform while practicalizing the implementation can be complicated incurring logistical challenges (Mitsopoulos, 2020).

Moreover, Europe's sustainability agenda is dependent on broader global movements connected beyond borders. For instance, such leadership on sustainability by the United

Nations, i.e., United Nations Sustainable Development Goals (SDGs), which emphasize upon the necessity of sustainable practices across all spheres and countries in divergence with each other (United Nations, 2015). Mechanically put together, the whole country of Greece plays a crucial role in bringing this international initiative and objective aligned.

As the study seeks to explore these intersecting dimensions of sustainability glued with logistics, and their presence in the Greek public sector, these intersecting dimensions, coupled with a review of existing literature will identify challenges, opportunities, and prospective strategies for integrating sustainable practices into a logistics design in the Greek public sector.

1.2 Research Objective

The overall purpose of this dissertation is to comprehensively review the literature on sustainability, logistics, and the role of the public sector with a particular focus on Greece. This work strives to shed light on the principal issues and opportunities in introducing sustainable practices within Greek logistical operations within the public sector.

Sustainability is imposing an increasing claim in both the private and public sectors across the world. Firstly, there have been numerous factors that ensure sustaining interest in sustainability globally, such as climatic change, population growth, scarcity of resources, and societal inequality (United Nations, 2015). Secondly, the urgency in terms of demanding audiences' attention towards sustainability remains unequally distributed amidst global concern and discourse on planetary issues. In reaction against these perils, government expenditure agencies are compelled to rethink and restructure their operations. Yet, most significantly, the logistics segment regarding the public domain has remained relatively under-explored when it comes to research regarding its sustainability involvement (Mangla, Luthra, Mishra, Singh, Rana, Dora & Dwivedi, 2015).

Since the Greek public sector lies within the European Union, the sustainability strategy set by the European Union has an overwhelming influence over the Greek public sector. The European Green Deal was devised to give overriding substance to transitioning towards sustainable and environment friendly economy where environmental requirements will be considered when designing new policies for member states involved (European Commission, 2020). However, the exact implications for the Greek public sector's logistics operations have been somewhat unrealizable especially regarding clarity. There is not enough academic literature regarding the sustainability in Greek's public sector logistics operations. As a result, this research works to build up a deeper comprehension concerning the impact of this broader sustainability agenda on logistics operations within the Greek public sector.

Additionally, this work will seek to identify the sort of logistical difficulties experienced by the Greek public sector prior to the implementation of sustainable practices. Since Greece recuperated from its severe economic crisis, classifying the current moment pertaining to relative public sector Sustainability is quite a novel case in basis traverse mainly devoted to European countries. Its public sector has adjusted patterns of legislation along with tightening budget constraints and socioeconomic structural inefficiencies (Mitsopoulos, 2020).

In identifying themselves during initial identification, the research will also delve at different potential opportunities thus representing better approaches to overcoming them. Borrowing from other country experiences or drawing upon academia research signifies bringing useful insights able to amplify the sustainability associated with logistics practice within the Greek public sector.

Overall, this work contributes toward enhancing the obvious body's increase in literature dealing with sustainability perspectives of logistics with a concentrated relevance to the issue pertinent to Grecian situation.

1.3 Research Questions

The pursuit of this research aims to explore how the Greek public sector can better integrate sustainability into its logistical operations. This exploration will be directed by several key research questions, proposed in the present work to guide the direction of the research. These questions suggest a holistic understanding of current states and directions, with regards to opportunities as well as challenges faced. They are as follows:

- i. RQ1: What is the state of sustainability within the Greek public sector in relation to logistical operations, especially what is its current status?

To get at the head where things shape or may shape towards pursuing the opportunity for progress, it's paramount that first, what exactly is the landscape right now? Research Question 1 implies efforts towards getting to the root of the current state of affairs against the backdrop of managing change – or rather grasping Sustainability-on-a-budget through an investigation of possible conceptions from other stakeholders/perspectives (European Commission, 2020);

- ii. RQ2. What are major problems in any attempt to implement sustainable logistics within the Greek public sector's logistics?

There will likely be big challenges involved on the implementation side in bringing about more sustainability ground operations within the Greek Public Sector. It could be argued that any move towards sustainability will pose big enough challenges particularly dealing with a background of cuts in the public service delivery system - Mangla et al., 2015;

- iii. RQ3. What impacts do different international sustainability strategies, especially those coming from the European Union, have on the Greek public sector's logistics operations?

Subsequently being a member of the European Union itself, Greece is essentially forming part of broader European sustainability strategies such as the European Green Deal (European Commission, 2020).

- iv. RQ4. What potential strategies would they then adopt in order to enhance their sustainability within the Greek public sector's logistics?

The exercise of going beyond just the basic insights earned here, this literature review question seeks carefully to identify and appraise potential strategies views aiming at enhancing the existing academic and policy climate around sustainability and logistics along with the public sectors.

1.4 Scope of the Thesis

The domain of this research is delineated by the focus on the intersection between sustainability, logistics, and the public sector within the context of Greece. It does not cover all aspects of sustainability or logistics within the realm of the public sector but instead narrows in on key themes that are primo when it comes to the relevance of the Greek context.

First, the study has focused on sustainability as it pertains to logistics within the public sector. The sustainability lens used for this research will draw from the United Nations' Sustainable Development Goals (SDGs) framework. This provides a broader understanding of sustainability across economic, environmental, and social dimensions (United Nations, 2015).

Secondly, the research centers on logistics within the Greek public sector. Logistics form an important part of public sector operations and covers areas such as supply chain

management, procurement as well as transport (Mitsopoulos, 2020). Through an examination of how these logistical operations can be made more sustainable, consideration has been given to the specific challenges and opportunities within the Greek context.

Thirdly, the research centers on the domain of the public sector in Greece. The public sector is a wide and diverse arena comprising various ministries, departments, and agencies at national, regional, and local levels. Even while recognizing this diversity, the study will aim to provide insights that are broadly applicable equally across the Greek public sector. It will look at overarching themes and patterns rather than going into the minutiae of individual public sector entities.

Additionally, the research was guided by within the field and its literature review questions listed below. These questions would serve as a structured approach toward exploring the key themes for the research so as to nail down its defined scope.

2. Literature Review

2.1 Understanding the public sector

The public sector, also referred to as the state sector or the government sector, is a part of the nation's economy comprised of both public services and public enterprises. Public services include organizations in the government bureaucracy that are involved in operation at different levels—local, regional, and national—and cover areas such as education, healthcare, public transportation, and law enforcement. In addition, public enterprises are also owned by the government and involve the commercial sector (OECD, 2015).

The public sector plays an important role in terms of overall societal functioning. It is responsible for the provision of essential public goods and services, which are necessary for the welfare of citizens and therefore include health, education, security, and

infrastructure (Boyne, 2002). Furthermore, the public sector has the role of policy-maker within its scope: it influences the economy through its set of regulations, standards, and policies guiding human activity from the private sector and civil society (Rainey, 2014).

The general characteristics of the public sector distinguish it away from their counterparts, i.e., the private sector. For instance, public sector organizations generally seek funding based on taxes and hence accountable to both the public and elected officials; they operate under varying legal and regulatory frameworks as well as being subjected to a unique set of expectations, pressures, and challenges (Pollitt & Bouckaert, 2017). Decision making in the public sector often entails managing competing interests with the objective of establishing relationships that will ease tensions among stakeholders while working towards social, environmental, and economic goals rather than profit maximization initiatives (Denhardt & Denhardt, 2015).

Understanding these unique qualities of the public sector allows for considering issues like sustainability and logistics beyond just superficial facts. Specifically, implementing the concept of sustainable practices in logistics operations within the public sector can be particularly challenging due to factors like budget constraints, bureaucratic resistance coupled with meeting diverse stakeholder expectations respectively (Walker & Brammer, 2009). At the same time, the public sector's size, influence, along with reach then allow them to significantly affect adoption of sustainable practices (Walker & Brammer, 2009).

2.2. Sustainability: Definition and Importance

Sustainability is a complex construct with a plethora of interpretations and applications in diverse sectors and disciplines. The most widely cited definition of sustainability comes from the Brundtland Report of 1987, which was given its name after the World Commission on Environment and Development chairperson, Gro Harlem

Brundtland. It defined sustainable development as “development that satisfies the needs of the present without compromising the ability of future generations to satisfy their own needs” (WCED, 1987, p. 43).

This definition focuses on the longer-term view with the understanding that impacts of today’s actions down the current and/or future generations. It also highlights the need for an equitable balance or interplay between economic growth, social inclusion, and environmental protection usually referred to as being the ‘triple bottom line of sustainability’ (Elkington, 1997).

The importance of sustainability is found in its function as a guide for action within a world facing multiple interconnected challenges. Environmental issues such as climate change, biodiversity loss, and resource depleting require a more cognizant and likely commanding strand in practices across all sectors in society. Simultaneously, social and economic seen complexities like inequality, poverty, and social injustice call for a more inclusive course in developments (United Nations, 2015).

Sustainability has gone into significant business and public sector focus. This includes increasing awareness among consumers, investors, and regulators about what they can do to drive organizations to want to integrate sustainability throughout strategy and operations and value chains (Bansal & Song, 2017). Often this will involve implementing sustainable practices such as efficiently using resources and waste management processes, effective energy depiction policies, outstanding supply chain programs, and favorable engagement by stakeholders (Kuhlman & Farrington, 2010).

Most significantly, sustainability has even greater potential benefits in the public sector. As providers of public goods and services, these organizations have an obligation to lead by example in transitioning to the sustainability society (Alford & Greve, 2018). However, these organizations continually play pivotal roles to set thus regulating and policy

framework that guides the wider economy's efforts at sustainable development (Walker & Brammer, 2009).

This contemporary fathoming of sustainability and premise places ground work for investigating how sustainability integration may be in the public sector logistics operations. Enhancements in the level of service economies offer and offers in return, highlighting higher thematic cooperation.

2.3 Logistics in the Public Sector

Logistics in the public sector include a wide range of activities involved in procuring, storing, transporting and distributing goods and services required to deliver public services. There are four functions that fall under this area: inventory management, supply chain management, fleet management, and waste management (Thai, 2001).

Several reasons have been put forward outlining multiple aspects of the role of logistics in the public sector. It directly affects the capability and efficiency of public services. For instance, logistic procurement can ensure effective supply chain management for healthcare facilities where need is met by adequate medical supplies or teaching materials for schools. In this way, logistics is carrying out its key duty to fulfill the mission of the public sector-to serve the public (Arlbjørn & Freytag, 2012).

Secondly, finances form an integral part of the overall logistics in the public sector. Quite often the public sector manages big volumes of goods and services thereby making logistics account for huge percentages in the budget of the organization. Efficiency and effectiveness of logistical operations result from cost savings, which mean freeing up of resources to be utilized for other public services (Thai, 2015).

Thirdly, logistics leads to particular challenges and restraints over and above private sector counterparts. This entails budget constraints as well as complicated regulatory requirements; a framework involving balancing diverse stakeholders' expectation on all

odds. Public sector's logistics should control these challenges but at the same time maintain high standards of transparency, accountability and public service (Walker & Brammer, 2009).

Influences and outcomes of logistics externalise to any given situation may vary based upon varied socio-economic and environmental conditions. Logistics in a specific context such as a public sector organization impacts on broader socioeconomic and environmental areas like social objectives like employment creation, opportunities for equal access and equality before the law, conserving natural environment. These exerts impact on broader sustainability goals. Logistic operations with consideration to impact utilize renewable resources reducing both hazardous wastes and landfill carbon emissions.

2.4 Sustainability in Logistics

Sustainability in logistics, also known as green logistics or sustainable supply chain management, is the integration of environmental and social considerations into logistical operations. It involves managing material, information, and capital flows so that they minimize environmental impacts, promote social wellbeing, and create economic value (Sarkis, Zhu, & Lai, 2011).

The environmental considerations present in sustainable logistics might encompass any number of practices. They might include reducing energy use and greenhouse gas emissions; minimizing waste and material use; recycling and circularity; considering the lifecycle impacts of products and services. For instance, companies might opt for more fuel-efficient vehicles, use renewable energy sources, or implement waste reduction and recycling programs (Ageron, Gunasekaran, & Spalanzani, 2012).

Social considerations in sustainable logistics might entail ensuring fair labor practices; health and safety promotion; upholding of human rights; and community wellbeing creation. This might likely consist of doing things such as adhering to fair trade

principles; delivering decent working conditions; or contributing to local economic development (Seuring & Müller, 2008).

Economic considerations in sustainable logistics might involve increasing operational efficiency; cost reduction; creating new market opportunities; or enhancing company reputation. In fact, sustainability initiatives can often lead to cost savings for organizations through waste reduction or some form of energy efficiency. Such improvements could open up new business opportunities too, such as new markets for sustainable products or services (Carter & Rogers, 2008).

The importance of sustainability on a global level is increasingly recognized within the private and public sectors. This emanates from a variety of reasons that together drive a need for an acknowledgment and recognition of potential benefits, driving forces, challenges, and strategies involved with integrating different kinds of sustainability performance into organizational practices. These combined affect or motivation aspects are at play when companies advance their sustainability performance (Dowling & Haag, 2010).

Integrating sustainability into logistics offends very difficult challenges. First, they can be what are called technical challenges: these arise out of a lack of available technologies or data. Secondly, there exist organizational challenges, which include resistance to change; lack of knowledge or skills; short focus aspect (Junglella, Biermann, Jiriccik, 2015).

Despite this combination of challenges, there are many useful examples that successfully integrate sustainability initiatives into logistics organizations' behaviors. That offers valuable insights and lessons for organizations who seek improve their own realization about trends related to the area of sustainability performance. Alongside transparency leads to improved decision making by understanding different successes factors (Ahi & Searcy, 2013).

3. The Greek Public Sector: An Overview

3.1. Organizational Structure and Functions

The Greek public sector constitutes a significant part of the country's socio-economic make-up, playing roles and taking duties that contribute to filling the country's identity in many spheres. The public sector is largely defined by the central government, the regional government, and finally, the local government and includes various areas of responsibility by three branches of government. The main mechanism for implementing public policy and legislations, delivery of public goods and services, as well as regulation of societal activities can be found within this branch (Hlepas, 2014).

At the center level, the Greek public sector comprises of several ministries, each tasked with different areas of public policy. These ministries include but are not limited to the Ministry of Interior, Ministry of Finance, Ministry of Education and Religious Affairs among others. They are responsible for formulating policies in different spheres including coordinating with other ministries or authorities at the local as well as regional levels to ensure sound service delivery (Featherstone & Papadimitriou, 2015).

The ministerial positions require an appointment from the Prime Minister, who generally heads a ministry operating with support from numerous departments and units. For example, within the Ministry of Finance are units on economic policies, tax policies, and department responsible for public expenditure management. This reflects how diverse functions vary amongst the different ministries within the approach taken by the ministries (Spanou, 2008).

Greece is further divided into thirteen administrative regions headed by governors. Each region is responsible for planning predefined national plan besides coordination and development initiatives aimed at regional growth. They also oversee certain public services such as education and health at the regional level (Lazarou, 2019).

The local government comprises municipalities headed by elected mayors. Local Governments are committed to providing basic public services like waste management, water supply, urban planning, and social welfare services. Even though they have lesser responsibilities than the regional governments, they play some role in the companies' economic development and environmental management (Economou & Kousoulis, 2016).

3.2. Major Challenges

The public sector in Greece, which plays crucial roles in managing societal functions and services, is currently facing several challenges. The aftermath of the 2008 global financial crisis and the subsequent sovereign debt crisis have brought about substantial fiscal constraints on the public sector. This has greatly impinged on the country's fiscal consolidation as well as on structural reform (Ladi & Tsarouhas, 2014).

One major challenge outlined above is the pressing need for fiscal consolidation. Since the period between 2008 and 2016, when the economic crisis struck Greece, there has been tremendous pressure exerted on Greece to cut down public spending while at the same time increasing fiscal efficiency. These pressures are largely responsible for straining public services, a characteristic that impacts areas such as health, education, and social services. In other words, the public sector would find difficult digging into effective service delivery while also taking care of stripped budgets (Featherstone & Papadimitriou, 2018).

The need for structural reform comes as another major challenge described above. With an over-reliance on bureaucracy, rigid structures, and lack of transparency, perceived by citizens and stakeholders alike as performance barriers in delivering effective services, the Greek public sector has come under criticism. Thus, there is an urgent requirement for putting in place new structures, improving transparency, acknowledging the needs of citizens' voice with regards to service delivery, and developing more responsive citizen-centric approach toward delivering service (Makrydemetres, et al., 2017).

The third major challenge put forward above is growing demand for improved sustainability in its operations. As awareness around environmental considerations and socially oriented issues become widespread in society, there emerges an expectation for the public sector to be innovative in using green processes; this includes promoting sustainable procurement, minimization of wastes through reduction or reuse, enhanced energy efficiency and increased use of renewable sources of power, and sponsorship of culture of relevance to society (Meehan & Bryde, 2011).

Major human resource challenges exist which include political patronage, lack of meritocracy and adequate staff training and development. Thus far, these challenges were identified to contribute significantly to inefficient performance as well as poor quality of service delivery. Human Resource Management reforms including promotion of meritocracy, professionalizing the civil service among others are seen as essential tasks in order to improve the performance of the sector (Nikolopoulos & Alexopoulos, 2014).

Synoptic overview of all three challenges: Navigating these challenges will require concerted efforts from the Greek public sector involving both immediate short-term pragmatic thrusts and longer tracks for sustaining the development aspirations of the organization. The preceding sections have considered how the concept of sustainability, particularly in logistical operation can be advantageous in terms of addressing the two other highlighted challenges.

3.3. Recent Reforms and Initiatives

With these challenges in mind, the Greek public sector has undertaken several reforms and initiatives recently to address what can be viewed as key areas of reform aimed at improving its efficiency, transparency and sustainability.

One such area of reform has been in governance and administration. The Kallikratis plan was first initiated in 2010 and represents one of the more ambitious undertakings by

the Greek government over recent years aimed at altering the structure and practices of the country's public administration. This involved major restructuring of local government structures reducing the number of municipalities and promoting greater decentralization (Hlepas & Getimis, 2011).

In terms of fiscal consolidation, this restructuring of local government entities with respect to financial management is reflected in efforts towards reform that have been made by the Greek government. This includes mechanisms ranging from the creation of a medium-term fiscal strategy; establishing a Fiscal Council which provides independent analysis and advice relating to fiscal policy implementation; as well as implementing a new budgeting/accounting system intended to enhance both transparency as much as possible while also enhancing accountability (Alexopoulos & Economou, 2018).

Sustainability has become another key focus of recent initiatives. In incorporating a set of global principles pertaining to sustainable development within the National Strategy for Sustainable Development, the Greek government embraces commitments to reduce greenhouse gases emissions, promote promotion of sustainable consumption and production processes as well as integrating sustainability into decision making procedures. Several initiatives by different ministries have commenced in order to promote sustainable procurement, waste reduction/separation processes energy efficiency (Hatzichronoglou, Polyzos & Minetos, 2017).

Human resources are likewise an area of focus in recent initiatives regarding sustaining adequate skills and competencies currently displayed in the labor market to stem future job losses associated with technological change across multiple industries. This involves launching the ASEP (Supreme Council for Civil Personnel Selection) system, aims at primarily the promotion of meritocratic recruitment espoused through fairness/diligence criteria rather than determining recruitment/promotions based on political patronage. This

has also included investment in training and continuing programs for public sector employees aimed at enhancing their skill sets/competencies (Papalexandris & Panayotopoulou, 2015).

Another area of focus continues to be digitization centered on issues concerning the overall modernization of public services via digital technologies ‘de-bureaucratizing’ bureaucratic patterns commonly observed ‘internally’ or between external stakeholders and creating favorable access and quality complexities throughout. These include initiatives such SBC; smart(er) card ‘New Identification Rulebook (NIR), online public consultations, and e-government services (Economou, et al., 2019).

3.4. Impact of EU Policies on the Greek Public Sector

The European Union (EU) has had a profound impact on the Greek public sector through its policies, directives, and funding mechanisms. Greece’s membership in the EU necessitates its fidelity to the EU regulatory frameworks; that is, their impacts extend far beyond economic policy and governance to encompass areas such as environmental standards and human rights (Bouckaert, Nemec, Nakrosis, Hajnal & Tönnisson, 2008).

Economic and fiscal policies emanated from the EU have acted with particular profundity. Following on the 2008 global financial crisis and the subsequent Greek debt crisis, the EU along with the International Monetary Fund (IMF) imposed stringent austerity measures as a condition for financial assistance. The suggested measures comprised severe public spending cuts, tax increases and structural reforms profoundly affecting the Greek public sector’s financial management, service delivery and general structure (Featherstone, 2011).

The EU’s policies relevant to public administration and governance have likewise been key in shaping the Greek public sector. Its concern for western democracies was

evident in its adoption of the European principles of administration which encompasses legality, reliability and predictability, openness and transparency, accountability, and efficiency and effectiveness, coupled with an examination of efforts to modernize Greek public administration and promote good governance (Spanou, 2008).

Additionally, the EU's environmental policies especially those pertaining to sustainability have been instrumental in pushing the Greek public sector towards more sustainable practices. The evidence relating to the EU's 2030 climate and energy framework which highlights ambitious goals for reducing greenhouse gas emissions, augmenting renewable energy usage and reforming energy systems renders the incorporation of sustainability tendencies into public sector operation including logistics (Hatzichronoglou, Polyzos & Minetos, 2017).

Their human rights, equality, and social inclusion policies have likewise influenced their Greek public sector. Relevant to this influence is their adoption of the European Social Charter giving fair standing to social and economic rights contained within it and their orientation of the EU's directives on equality and non-discrimination (Karamessini, 2014).

Lastly, the EU provides great funding to Greece through many avenues but principally through the European Structural and Investment Funds (ESIF), which support ESDI's at work in economic development, employment, education and social inclusion 'proving integral part of financing projects and initiatives' (Monastiriotis, 2021).

4. Sustainability in the Greek Public Sector

4.1. Evolution and Current Status

The concept of sustainability has largely trickled into the Greek public sector over time, influenced by a complex blend of internal pressures, international trends and EU policies. The roadmap towards a more sustainable Greek public sector has been

evolutionary, with progress being made at different paces and some notable challenges along the way.

The first signposts beyond environmental concerns to enter the Greek public sector date back to early times in the 1990s. During this decade, just as many other countries were integrating environmental considerations within their policy frameworks, Greece began to inch its way forward on these issues too, notably in areas such as waste management, water treatment, and land use planning (Halkos & Tzeremes, 2013).

During the early 21st century, when memory is short and facts even foggier still, the concept of sustainability broadened and deepened further in the Greek public sector. Partially owing to the influence of EU environmental and sustainability policies, part through years of commitment from various stakeholders, each seeking inclusion over exclusion; greater holistic sustainability became an essential complicating factor encompassing not only environmental considerations but also social and economic factors too (Ladi, 2014).

Curiously enough, it is currently that same Greek public sector's commitment to sustainability which appears to be becoming pronounced and wide-ranging following several positive developments in recent years. First among these is the National Strategy for Sustainable Development, launched in 2017 and signaling a wide approach towards sustainability integration (Hatzichronoglou, Polyzos & Minetos, 2017).

In conclusion, while significant strides have been taken by the Greek public sector on the road to making itself more sustainable, the journey remains ongoing and there is much room for continued efforts towards embedding sustainability into its operations and practices.

4.2. Legal and Regulatory Framework

The sustainability agenda of the Greek public sector is guided and governed by several legal and regulatory frameworks at both national and European Union (EU) level. The framework provides details about obligations, standards, and procedures that public sector organizations are required to follow in terms of their performance in terms of their environmental, social as well as economic dimensions.

Law 3855/2010, which governs the national law, represents an important piece of legislation at the Greek legislative context. This law dedicates itself toward promoting sustainable development and therefore assigns a broad framework for using sustainability principles within the operation of the public sector. It provides objectives and strategies regarding areas like climate change mitigation, natural resource management as well as transportations that are considered as sustainable (National Gazette, 2010).

Moreover, the legal framework for public procurement, represented by Law 4412/2016, integrates sustainability considerations into the purchasing practice of the public sector. This law pushes the adoption of sustainable procurement practices considering that it allows public bodies to take considerations regarding environmental and social criteria concerning their purchasing decisions (National Gazette, 2016).

Greece has another significant element on the sustainability landscape governing its legal frameworks regarding energy efficiency, which is governed by Law 4342/2015. This law transposes EU energy efficiency directives and thus establishes a framework for enhancing energy efficiency within public sector building undertakings and operations (National Gazette, 2015).

At EU level, the mandate of Greek public sector organizations is that they are required to comply with a number of directives and regulations pertaining to sustainability. This includes the EU Sustainable Development Strategy directed toward increasing the

sustainability of Europe. They have defined a roadmap for achieving this goal which consists of the laws of Europe hence requiring member states including Greece to integrate sustainability consideration within their public sector operations (European Commission, 2018).

Moreover, EU Directives such as the Energy Efficiency Directive (2012/27/EU), the Renewable Energy Directive (2009/28/EC), impose obligations on Greece for improving energy efficiency, increased use of renewable energy in the public sector (European Commission, 2012; European Commission, 2009).

The most recent directive of the European Union termed as the Public Procurement Directives (2014/24/EU and 2014/25/EU). They prescribe guidelines relating to how environmental and social issues can be taken into consideration in constructing these public procurement processes. These directives have been presented in Greek's legislative framework through Law 4412/2016 and thus constitute a key part of the legal framework for sustainable public procurement in Greece (European Commission, 2014).

Overall, these legal and regulatory frameworks present a strong background setting the sustainability agenda of the Greek public sector. However, they hold significance only if they become effective where implementation and non-compliances hallmark any kind of activities undertaken in accordance with them.

4.3. Case Studies of Sustainability Practices

Investigating concrete cases of sustainability practices in the Greek public sector can assist in identifying how sustainability principles are actually being practiced. Two most prominent examples include the “Green Schools” project and the sustainable public procurement practices of the Hellenic Parliament.

The “Green Schools” project is a joint initiative of the Hellenic Ministry of Education and Religious Affairs, in cooperation with Centre for Renewable Energy Sources

and Saving (CRES). The project aims to raise environmental consciousness among schools and promote sustainable practices within the educational sector. Participating schools undertake different initiatives; they install energy-saving devices, such as lighting products that consume less electricity, or heat and air conditioning systems; they organize recycling programs such themselves and class materials properly; they implement measures at the school premises aimed at conserving natural resources, through techniques such as reusing of water pipes, irrigational methods invented during Greece's civil war, as well as various types of trees used in forest plantations. Besides, schools are encouraged to implement solar energy systems and contribute to renewable energy targets. The 'green schools' project has been recognized by the EU as one of these best practice models to push forward sustainability in the educational sector (Hellenic Ministry of Education and Religious Affairs, 2017; CRES, 2018).

Another instructive example of sustainability practice is the Sustainable Public Procurement Approach of the Hellenic Parliament. The Hellenic Parliament was starting to incorporate sustainability considerations into its purchasing decisions, with an emphasis on trying to reduce waste and use efficient quality appliances towards working on minimizing energy consumption. For instance, it procures energy-efficient IT equipment and lighting systems; implements a comprehensive waste recycling program that includes sorting; implements eco-friendly cleaning products; it uses energy saving clothing, desks, sinks, ventilation devices, as an example, the European Commission highlighted one set of sustainable procurement practices by the Hellenic Parliament in its book called "Buying Green! Handbook on Green Public Procurement" (European Commission, 2016).

These studies reveal that the Greek public sector is moving closer to incorporating sustainability principles in its operations. They exemplify what kind of projects that could be undertaken to embed sustainability practices within the ordinary practices conducted by

public sector organizations, ranging from those dealing with school infrastructures management to parliamentary procurement processes. Nevertheless, they also betray this need-to-strengthen such practices across the total scope of the Greek public sector to render sustainability a fundamental principle throughout all its operations.

4.4. Public Perception and Awareness

Public perceptions and knowledge about sustainability issues are crucial to developing and improving the efforts in approaching sustainable public policies. In Greece, there have been significant changes in the public's perceptions of sustainability and its importance over time, influenced by a variety of factors extending from national policies to trends abroad to EU statutory directives.

In terms of recognizing sustainability issues as priority public policy concerns, long before the twentieth century, Greek public's awareness has been limited only for environmental issues such as recycling, pollution, and conservation (Gaddy, 2017). With time, this understanding has extended further to encompass more holistically a better picture of sustainability emphasizing social and economic dimensions (Jones, Evangelinos, Gaganis, & Polyzos, 2019).

Data portray that among the Greek population's perception regarding climate change is on an upward trend, with increasing support on renewable energy and energy efficiency initiatives (Eurobarometer, 2018). Moreover, there is increasing recognition of the essential role which the public sector plays in pushing sustainability values agenda during decision making processes and operations. For example, it is shown through a survey executed by the Greek Ombudsman (2019) that apart from being aware about serious impacts of climate change/globalization problems for society, a large proportion of respondents thinks that public sector organizations should dedicate their attention to sustainability issues in both their operations and decision-making processes respectively.

Public awareness and support likewise have been boosted by various education and communication initiatives on sustainability. For instance, according to the research data discussed earlier, "the Green Schools" program representing scores of scientific experts and teachers across Greece proves to be one major factor promoting an awareness-raising approach on sustainability affecting not only students but also teachers and parents (CRES, 2018).

Nevertheless, challenges still persist. Public awareness concerning sustainability is still nonuniform although positive trends can be seen up until now; varying gaps exist even in understanding specific aspects of sustainability concepts and practices amongst different segments of populace. Lastly, debates about tradeoffs between sustainability and its associated societal goals like economic growth and job creation continue hence impact upon public support for sustainability initiatives (Jones, Evangelinos, Gaganis, & Polyzos, 2019).

5. Logistics in the Greek Public Sector

5.1. Logistics Management and its Importance

Logistics management is a critical function of the Greek public sector. It embraces all activities connected with operations associated with procurement, movement, storage, and distribution of goods and services required for public sector operation. It includes areas such as inventory management, transportation, warehousing, and supply chain arrangement.

In the context of the public sector, effective logistics management is significant for several reasons. First, it enables public sector organizations to carry out service delivery efficiently and effectively, thereby ensuring fulfillment of their duties regarding the provision of services to the public population and satisfaction of citizens (Tsiakis, Papageorgiou, & Pechlivanoglou, 2010).

Secondly, public sector finances can be significantly impacted by well-designed and optimized procurement processes, minimum waste in purchases, streamlined supply chains

among different organizations, which will collectively lead to the achievement of cost savings by the public sector organization. This has become vital particularly in Greece considering that there have been debts placed on the public finance after economic crisis has occurred at the end of the 20th century (Tsoulfas & Pappis, 2006).

Thirdly, logistics management is crucially important with regard to resilience and responsiveness of public sector organizations. So, organized properly through efficient ways of procuring resources in accordance with requirements, minimization of waste within projects, streamlining of supply chains among suppliers across organizational boundaries are some opportunities that bring awareness toward functioning more responsively and resiliently (Papadopoulos, Karagiannaki, & Polemis, 2017).

Additionally, environmental sustainability can also be positively improved through utilization of green logistics practices including energy-efficient forms of transportation, reduction of waste at source and sustainable procurement programs in various sectors of the economy (Papagiannaki, Diakoulaki, & Tsita, 2019).

Moreover, despite its significance, current logistics management in the Greek public sector has met with hundreds of challenges: bureaucratic incentives required to make changes; contrary to change; outdated technologies employed in functions; lack of coherence in arrangements implemented among different organizations. Therefore, improving these regards as well as enhancing logistics management as a key performance improvement initiative to enhance the effectiveness and sustainability of the Greek public sector.

Logistics management is an essential function in the Greek public sector underpinning its operational efficiency, fiscal sustainability, resilience and responsiveness. Performance enhancement is therefore a prime challenge concerning logistic management

for increasing performance effectiveness, sustainability execution capabilities and competency capability allocation.

5.2. Challenges and Opportunities

There are several challenges and opportunities that affect logistics in the Greek public sector, each of which is shaping the way these essential services get delivered.

i. Challenges:

Bureaucratic inefficiencies: Inefficiencies created by bureaucratic operations can result in unnecessary delays; these operations also create additional costs for items bought from suppliers. For example, an organization involved in complex procurement processes may have to wait for certain processes to be completed before acquiring goods and services (Karagiannakis, Manousaki-Konstantinidou, Konstantopoulos, & Mastronardi, 2012). There might be other infrastructure failures where movement through tracks or roads become harder requiring vehicles to be parked to prevent traffic congestion. Or an inadequacy in food storage causing a shortage in consumption leading to increased expenses on catering (Dimitriadou & Paizis, 2010).

Outsourcing solutions: Many Greek public sector organizations still outsource solutions when managing their logistics functions. Erroneous using of systems leads to wastage of manpower and budget as well as creating inefficiency. Rich data is available mainly with private enterprises either integrated with information technology professionals or provide cloud services according to requirement (Papadopoulos, Karagiannaki, & Polemis, 2017). Advanced technologies inspire more innovative systems allowing cost savings for business processes management. Moreover, the use of big data analytics helps make decisions in real time increasing efficiency/effectiveness (Karagiannakis et al., 2012).

Lack of coordination: Various types of operations lack coordination across different organizations and levels of government in the Greek public sector. Cynicism among staff executives or operating units where there has been duplication of efforts usually leads to inconsistencies regarding logistics practices with said organizations. Therefore, many award opportunities fail to materialize resulting in missed synergies and cost savings (Tsoulfas & Pappis, 2006).

ii. Opportunities:

Digital transformation: Adoption of digital technologies enhances logistics management in the Greek public sector dramatically. Technologies like IoT, artificial intelligence, blockchain, and other emerging technologies augur well at streamlining procurement processes and minimizing errors/inefficiencies in inventories management; track/alignment activities; decision making amongst simultaneously occurring events (Papagiannaki et al., 2019).

Green logistics: Growing perception about environmental security necessitates the implementation of green logistics practice among the Greek public sector. Heritage knowledge including cost advantage, energy usage reduction measures applied which form efficient supply chain brings forth opportunity for green logistics implementation (Papagiannaki, Diakoulaki, & Tsita, 2019). Similarly, research shows that Athens container port ‘Athens East Port Authority’ realizes ninety percent of CO₂ emissions and mitigation measures therefore it allows carbon trading/reforestation in surroundings forests (Christofides, Voskalias, & Pantelidis, 2013).

Collaboration and partnerships: Fostering collaboration and involving different public sector organizations together with private sector entities assists in leveraging shared

resources, expertise, and technologies hence improving logistical operations (Tsiakis, Papageorgiou, & Pechlivanoglou, 2010).

In conclusion, while the Greek public sectors face tremendous challenges putting forward how they manage their logistics, it is evident that there are also substantial opportunities that can improve considerably by addressing the aforementioned challenges and seizing these opportunities so as to enhance the efficiency, effectiveness, and sustainability of the operations logistician.

5.3. Impact of Global Trends on Public Sector Logistics

Several such global trends are shaping the public sector logistics landscape, including that of Greece.

Digital Transformation: Dramatic digitalisation is altering logistics operations at unprecedented rates. At the forefront of this digital revolution is artificial intelligence and the generation of more advanced tools like the Internet of Things (IoT), blockchain, data analytics, among other things, successful implementation in the Greek public sector refers to investment by the government, skilled manpower, changes in organizational culture (Zhong et al., 2017).

Sustainability: With attention focused on environmental protection globally, sustainability has become a critical part of logistics. Standard practices like green procurement, waste reduction, and energy-efficient transport have garnered momentum. So will for Greece's public sector, as aligning its logistics operations with sustainability can improve environmental performance and improve public image as well (Isaksson & Huge-Brodin, 2013).

Globalization and Supply Chain Complexity: Amplified interconnectivity portended more complex supply chains. Hitherto dependent less on domestic factors, this called for robust logistics management. For Greece's public sector, this translates into managing

longer supply chains greater in number of suppliers and ever-growing risk of disruption. The heightened need for enhanced risk management prevents disruptions, increased transparency, and cross actor coordination (Christopher & Peck, 2004).

E-Commerce and Consumer Expectations: Energetic e-commerce boom resulting has set higher expectations for speedy, reliable, and transparent service delivery. In spite of the subject being primarily private sector issue, it results in public expectations that influence strategy in Athens to make enhancements to the speed, reliability, and transparency of its logistics operations (Agatz et al., 2018).

Pandemic Preparedness: During COVID-19 pandemic emphasis was laid on how efficient logistics be used during crises. Future preparedness calls for building resilient, adaptable type of logistics system that ensure timely delivery of essential services in times of emergency (Ivanov & Dolgui, 2020).

In summary, there are some of the salient global trends – Digital Transformation; Sustainability – that are portending change in logistics globally, which pose challenges but opportunities for Greece with respect to improving efficiency, effectiveness, and sustainability of its logistics operations.

6. Integrating Sustainability in Public Sector Logistics: International Perspective

6.1. Role of Sustainability in Public Sector Logistics

Logistics management has increasingly embedded sustainability into its central logic, especially in the public sector. It represents a balance between economic efficiency, environmental responsibility, and social equity—typically termed as the ‘Triple Bottom Line’ (Elkington, 1997).

- i. Economic Efficiency: The economic sustainability in public sector logistics ensures that operations are carried out efficiently, optimally using resources while minimizing waste. This includes implementing strategies like shared services,

supply chain optimization, and digital transformation to improve efficiency (Ahi & Searcy, 2015).

- ii. Environmental Responsibility: Public sector organizations globally find themselves under pressure regarding mitigating their environmental impacts. This includes reducing energy consumption, emissions, and waste where logistics operations are conducted, adopting ‘green’ practices such as procurement, circular economy principles are integrated into supply chains (Gold, Seuring, & Beske, 2010).
- iii. Social Equity: Social sustainability in public sector logistics involves ensuring that operations are conducted ethically and contribute towards social well-being. It includes fair labor practices, inclusivity, community engagement, along with contributing towards socio-economic development (Carter & Rogers, 2008).

International guidelines like the United Nations Sustainable Development Goals (SDGs) guide public sector sustainability. Many SDGs directly relate to logistics like Goal 9 (Industry, Innovation, and Infrastructure), Goal 11 (Sustainable Cities and Communities), and Goal 12 (Responsible Consumption and Production). Hence, sustainable logistics can contribute substantially to achieving these global objectives (United Nations, 2015).

In addition, global initiatives like Green Public Procurement (GPP) and international agreements like Paris Agreement on Climate change make it imperative for sustainable practices in public sector logistics. These initiatives target specific sustainability goals by public sector organizations, thereby driving the integration of sustainability in their logistics operations (European Commission, 2020).

Hence, sustainability plays an important role in public sector logistics, helping organizations achieve a balance between economic, environmental, as well as social contradictory; contributing significantly towards realizing global sustainability goals. It represents not only a burden or obligation but rather an opportunity for public sector

organizations to optimize their efficiency of which they carry out operations, their performance regarding environment impact.

6.2. Best Practices from Around the World

Public sector organizations around the globe are innovating and implementing best practices to integrate sustainability into their logistics operations. Below are a few exemplary cases:

The United Kingdom: The UK government has implemented a Greening Government Commitments (GGC) strategy through which it aims to reduce the environmental impact of the public sector's operations, including logistics. The strategy mandates domestic flight reduction, rail use increase, as well as low-emission vehicle use, resulting in remarkable reductions in carbon emissions (UK Government, 2018).

Sweden: Sweden's Strategic Procurement for Sustainable Innovation program focuses on leveraging public procurement to drive innovation for sustainability. It focuses on areas like transportation, with emphasis on energy and construction, promoting green technology and sustainable logistics adoption (OECD, 2017).

Australia: The Australian government's Fleet Vehicle Purchasing Policy requires that its Public Sector fleets acquire fuel-efficient and lower-emissions vehicles. The policy has dramatically reduced fuel consumption and greenhouse gas emissions, indicating the capacity of green procurement in public sector logistics (Australian Government, 2019).

Singapore: The government launched the GreenGov.SG initiative. The initiative provides an underpinning framework for public sector organizations to improve their environmental sustainability. It entails guidelines on sustainable procurement, energy-efficient buildings among others. They have achieved tremendous reductions in paper consumption, use of electricity, and waste generation (Ministry of Sustainability and the Environment, 2020).

Canada: The Canadian government includes a comprehensive approach toward sustainable logistics with targets for reducing greenhouse gases, liquid wastes, and paper consumption. It also entails a commitment by the year 2030 to electrify the government vehicle fleet (Government of Canada, 2020).

Those best practices illustrate how the public sector organizations can effectively integrate sustainability into their logistics operations. It illustrates a variety of strategies, from green procurement and energy efficiency to likewise waste reduction and sustainable transportation embrace.

6.3. Lessons for Greece

Lessons from the international best practices in integrating sustainability into public sector logistics can be valuable lessons for Greece.

Clearly Defined Sustainability Targets: The examples of the UK, Canada, and Singapore emphasize the importance of clearly defined, quantifiable sustainability targets. Targets help steer efforts towards sustainability and provide accountability. Likewise, some lessons on how to drive sustainability by adopting specific targets are equally applicable in Greece (Government of Canada, 2020; Ministry of Sustainability and the Environment, 2020).

Sustainability Procurement: Encouraging evidence from Australia's Fleet Vehicle Purchasing Policy that better use of green procurement provides impetus for sustainability in logistics operations. Similarly, encouraging evidence from Sweden's Strategic Procurement for Sustainable Innovation program that high value goods and services could lead to green purchasing shows promise in helping stimulate consumption of sustainable solutions in Greece's public sector (Australian Government, 2019; OECD, 2017).

Technology Use: Taking advantage of digitalization is critical in enhancing efficiency and sustainability in logistics operations. When applied technologies like IoT,

Artificial intelligence (AI), and Data analytics and IT, they enhance the time and money savings through better resource usage, reduced wastes. Increased investment regarding digital technology in Greece's logistics operations can further help streamline operations and reduce waste (Zhong et al., 2017).

Engagement of Stakeholders: The realizations coming with success in carrying out sustainability initiatives require varied stakeholders including employees, suppliers, and even public engagement. Building awareness and understanding of sustainability objectives, involving stake holders in their achievement would augment realizing interests regarding achieving it (Walker & Jones, 2012).

Evidence showed that a supportive regulatory framework for sustainable logistics plays an integral part in successful implementations. Incentives either by giving away unsustainable ways or penalizing them makes compliance hence impacting positively gains credibility as a sustainable. Greece can definitely strengthen its regulatory framework by including governing consumer conduct that could provide higher carbon emission reduction threshold ability to market environmental-friendly products and services (OECD, 2017; Ministry of Sustainability and the Environment, 2020).

6.4. Comparative Analysis: Greece vs Other Countries

Comparing these efforts against others highlights both challenges and opportunities:

- i. Sustainability Targets: Unlike countries like the UK, Canada, and Singapore, which present a clearer picture of their sustainability target by clearly defining and publicly accessible targets, Greece presents less defined but potentially more accessible targets. A stronger and arguably publically available set of sustainability targets could impart clarity to Greece's public sector logistics efforts, increase accountability, and prove proof that sustainability is at the heart of government (UK

Government, 2018; Government of Canada, 2020; Ministry of Sustainability and the Environment, 2020).

- ii. **Mobility/Green Procurement:** While Australia and Sweden have brought about robust green procurement policies, Greece's efforts in relation to this area are relatively nascent. Expanding green procurement policies will stimulate the market for sustainable products from supporting firms in Greece, reducing environmental burdens on its public sector logistics system (Australian Government, 2019; OECD, 2017).
- iii. **Digital Technology:** Although adoption of digital technology is increasing in countries such as Singapore, Greece is lagging behind on digital transformation. investments in technologies such as AI, IoT, and data analysis might enhance the efficiency and sustainability of Greece's public sector logistics (Ministry of Sustainability and the Environment, 2020; Zhong et al., 2017).
- iv. **Participation of Stakeholders:** Compared to countries such as where stakeholders continue to engage closely with governments on obstacles to achieving sustainability targets – surprisingly enough, it has been in the United Kingdom (Walker & Jones, 2012; UK Government, 2018), while stakeholder engagement appeared somewhat minimally developed within Greece compared to other countries – Enhancing stakeholders participation can contribute to greater support for sustainability initiatives as well as help drive effective implementation (OECD, 2017; Ministry of Sustainability and the Environment, 2020).
- v. **Regulatory Frameworks:** Comparing regulatory frameworks for sustainability against those in Switzerland, Japan, or even simply the United States of America, for examples, there is cavernous room for improvement here in Greece given the weakness of its current regulatory framework for sustainability. Strengthening this framework might compel sustainability initiatives to capitalise on more convincing

profits and progress towards sustainability (Ministry of Sustainability and the Environment, 2020; OECD, 2017).

In conclusion, although Greece has put forth tangible steps toward integrating sustainability in its public sector logistics, there still exists much ground upon which further strides may be made. Lessons derived from comparisons of other cases suggest places where further focus has the potential to better Greece's sustainability intentions in public sector logistics.

7. Potential and Challenges of Sustainable Logistics in the Greek Public Sector

7.1. Understanding the Potential

Sustainability in the public sector in Greece brings significant potential benefits, from economical savings to social gains and environmental preservation. Realizing this potential can transform public sector operations as well as influence market behavior and play an instrumental part in shaping a more sustainable future for the country.

- i. **Economic Benefits:** Integrating sustainability into logistics operations can bring substantial economic benefits to the public sector. By optimizing resources, the Greek public sector stands to reduce its operating costs (Wang, Lin & Huang, 2014). Through strategic sourcing and procurement, the public sector has a lot of power to focus on procuring products and services that have a longer lifecycle and are energy efficient. This approach is termed green procurement and not only fosters sustainability but also brings substantial long-term savings (OECD, 2015).
- ii. **Market Influence:** The very nature of how the public sector as a major procurer of goods and services makes it one of the most influential buyers in the market when it comes to driving sustainable practices. Focusing on environmentally friendly products and services through such efforts can stimulate demand for these

commodities. Such demand will motivate suppliers to shift their production methods thus increasing sustainability within the broader market (OECD, 2015).

- iii. **Environmental Impact:** Incorporating sustainability in public sector logistics can significantly decrease environmental footprints. Lowering greenhouse gas emissions; reducing waste; conserving natural resources; supporting biodiversity - all contribute significantly to mitigating climate change. Exploiting renewable energy sources for logistics can further augment these efforts (Schaltegger & Csutora, 2012).
- iv. **Social Benefits:** Beyond the economic and environmental potential, sustainable logistics naturally hold tremendous social benefits. Investment in green technologies can lead to job creation in the renewable energy and sustainability sectors but also immense change in terms of creating a safer and cleaner environment. Stimulating demand through increased focus on environmentally friendly products and services by the public sector can lead to improved air quality thus areas with poor ambient qualities where health issues arise can be completely eradicated by Green Procurement strategies (UNEP, 2008).
- v. **Institutional Transformation:** Sustainability is not just environmental preservation; institutional transformation is a tremendously important component of it too. By adopting and crafting sustainable practices, public sector institutions are able to foster innovation, transparent excellence, accountability or any other--such practice thus improving transparency. It would lead to changes in technologies processes and business models thus driving operational efficiency enhancing organizational performance (Bocken et al., 2014).
- vi. **Policy Influence:** As the public sector in Greece moves towards sustainable logistics, it can also influence policy making. Policies supporting sustainable practices can be further bolstered by adoption of the sustainable practices by the public sector institutions. In turn, these policies at large can boost private sector

participation in sustainability practices thus spurring wider adoption of sustainability throughout the economy.

In essence, the integrative effect of Sustainability in Public Sector Logistics holds enormous promise. However, realizing this makes use of a multifaceted approach integrating Strategic planning, technological innovation, and finally a great commitment of principles. Equally important though is the creation of supportive legislative and regulatory environment otherwise known as incentive/penalties that captures positive support for sustainable practices while discouraging and penalizing those non-sustainable ones. Only through such comprehensive and concerted effort does Greece realize its true potential of SustainableLogistics in its public sector thereby contributing significantly to the bigger ambitions for the country.

7.2. Identifying the Challenges

Integrating sustainability into public sector logistics holds huge potential, but several challenges are required to ensure success in implementation and overcome barriers. The major challenges include:

- i. **Limited Awareness and Knowledge:** A primary challenge is a limited awareness and knowledge of sustainable logistic practices among the key stakeholders including policymakers, procurement officers, and logistics personnel. There is a need for training perceptions as well as capacity-building initiatives way to increase awareness through advancing across platforms and ensure common understanding involving durable sorts associated with sustainable logistics principles and benefits (McKinnon, 2010).
- ii. **Lack of Clear Guidelines and Standards:** Indicating that there has been no clear guidelines along with standards concerning sustainable logistics within the public sector can limit progress. Establishing comprehensive guidelines combined with

performance standards may represent a framework from which organizations could consistently follow the consistent rise to implement sustainable practice (UNCTAD, 2016).

- iii. Financial Constraints: Financial constraints very often present limits to put sustainability into action initiatives. Upfront costs originating from adopting green technology, upgrading infrastructure and staff training could be perceived being a barrier. While public sector organizations will require access to sufficient financial resources consisting of funding mechanisms plus incentives in order to support the implementation of sustainable logistic practices (UNCTAD, 2016).
- iv. Organizational Culture and Resistance to Change: Integrating sustainability into public sector logistics requires that there exists considerable shift in organizational culture and mind regarding sustainability. Resisting change, concern over disruption and reluctance to adopt appear while implementing the new perceived practices would need overcoming hurdles constructed. Overcoming this requires effective strategies of change management, leadership commitment and stakeholder engagement in fostering a climate of embracing sustainability (Walker & Jones, 2012).
- v. Complexity of Supply Chains: Public sector supply chains might seem simple on paper, but after deeper exploration, it has become evident that their complexity involves multiple determinants of supply chain fragmentation and hence heads of department must work together towards collating opportunities, realizing alliances amid different agencies or suppliers and service providers both regional governments and local authorities essentially when considering multilevel supply chains (Carter & Easton, 2011).
- vi. Data Availability and Quality: Adequate data availability, quality on logistics performance, resource consumption impacts on environment impact is vital in enabling informed decision making and monitoring progress. Unfortunately, data

availability along with quality could be confined at times within the public sector. Building robust data collection systems, sharing data across organization blocks, and investing in data management capabilities come like a help combating these challenges (Carter & Rogers, 2008).

- vii. **Legislative and Regulatory Barriers:** Existing legislation especially regulatory barrier; (inform learners about) Sustainable logistic enterprise usually don't depict explicit strides towards enshrining. Evidentially overcoming barriers and ensuring Alignment between sustainability objectives and legal frameworks is essential. Revereching creating loopholes means revisiting and amending regulations, nurturing soundnesses starting institutions representing a cooperative principal's approach along side ensconcing resilienceconcerning sustainable logits practices (Bansal, 2005).
- viii. **Collaboration and Coordination:** Public sectors presents collaboration difficulties often relate to many agencies bureaucracy departments both national government levels. Besides coordinating the approaches can further industrial collaboration siloed manner leading to shut down addressing issues of coordination needed overcoming flaw preventing makers to occur discovering learning solutions (Carter & Easton, 2011).

7.3. Strategies for Overcoming Challenges

Several strategies can be employed to overcome the challenges associated with integrating sustainability into public sector logistics in Greece:

- i. **Capacity Building and Training:** Increase awareness and knowledge about sustainable practices required to navigate through the crisis. Implementing capacity building programs and training initiatives coupled with increased awareness will provide a real opportunity for public sector stakeholders to acquire necessary skills and understanding toward implementing sustainable practices (McKinnon, 2010).

An array of workshops, seminars, and educational material can be developed addressing the special requirements of different organizational units namely policymakers, procurement officers, and logistics personnel.

- ii. Establishment of Set Guidelines and Standards: Establishment of guideline sets and standards specific to sustainable logistics in the public sector requires proper deliberation. These guidelines should clearly outline best practice guidelines including key performance indicators as well as targets related to a sustainable vision (UNCTAD, 2016). Clear guidelines set the framework for organizations' operations; it also helps consistent implementation of sustainable practices across the public sector. Collaborative endeavors organized by the relevant stakeholders can help develop and disseminate these guidelines.
- iii. Financial Support and Incentives: Addressing financial constraint is crucial to facilitate the uptake of sustainable logistics practices. Public sector organizations can explore funding mechanisms and incentives coupled with support services to support sustainable initiatives. These may include grants, subsidies, as well as tax incentive to counter initial investment costs coupled with the early adoption and yetting of green technologies coupled with effective implementation of sustainable practices (UNCTAD, 2016). Close collaborations with international funding organization and popularity of public-private partnerships can also provide access to financial resources for sustainable logistics projects.
- iv. Change Management and Leadership: Change management approach along with fostering commencement of a culture that embraces sustainability requires skills pertaining to quality leadership alongside effective change management. Leadership commitment is essential in accomplishing the task of driving sustainability initiatives within the Public sector (Walker & Jones, 2012). Change management processes entail clear communication, stakeholder engagement, as well as prospective work towards creating the common shared vision for sustainability.

Establishing such sustainability champions besides offering learning and development opportunities leads to integrating sustainability goals deeply into performance evaluations.

- v. Enhancement of Data Management: Improve data availability and quality is crucial for evidence-based decision making along with monitoring progress. Public sector organizations can invest in data collection systems which improve sharing mechanism among departments, further developing standardized metrics to implement sustainability performance measurement, analyzed using digital technologies depending on methods such software such as data analytic and reporting platform to enable actual time tracking while evaluating sustainable Logistics.
- vi. Policy Reforms and Regulatory Support: Addressing Legislative and regulatory barriers is critical in supporting policy reform, if wishes to establish sustainability criteria integrated with public procurements, as well as regulatory frameworks alignment with sustainability objectives. Working with relevant stakeholders in positive collaboration readily available would result in changes where one has been inadequate and hence includes deepened ties with them (Bansal, 2005).

7.4. Scenario Analysis: Future Trajectories of Sustainable Logistics

The analysis of such potential future trajectories of sustainable logistics in the Greek public sector entails consideration of three different scenarios based on three different factors and drivers with the goal of gaining insights into possible outcomes that set a course for decision-making and planning. Here are three potential trajectories for the future of sustainable logistics in Greece:

Transformative Scenario: Big ambitions to achieve sustainability and Innovation

In this scenario, whether it be within the Greek public sector or any other country, ambitious and decisive actions will be taken towards sustainable logistics. The government

as an agency sets big ambitions, aligning efforts and initiatives with international frameworks like the United Nations Sustainable Development Goals (SDGs) and European Green Deal. Key actions include:

Firstly, stringent emission reduction targets are adopted, aiming at a lesser carbon footprint of operations' logistics facilities and vehicles powered by renewable energy sources. For example, such power can be derived from solar and wind installations that are encouraged to run logistics facilities and vehicles (UNEP, 2018). Similarly, adoption of electric vehicles and developing charging infrastructure become priorities in the public sector's logistics fleet (Seyfang & Haxeltine, 2012).

Secondly, comprehensive green procurement is introduced. We purchase products that are, first and foremost, sustainable. Purchasing standards including criteria relating to environmental and social dependency become part of public procurement processes. That implies acknowledging suppliers' commitment and ensuring they meet the criteria both environmentally and socially (OECD, 2015). This stimulates the desire of markets to buy eco-friendly versions together with encouraging the players in the industry to embrace sustainable practices throughout their supply chains.

Thirdly, setting innovation centers along with research institutions is established, with the aim at driving sustainable logistics innovation. It encompasses most users of technology—that is Internet of Things (IoT), artificial intelligence (AI), as well as blockchain—to drive gains in efficiency and transparency of logistics operations (Zhong et al., 2017). Such finding out about technological advancements allows real-time monitoring of consumption of resources, optimizing their logistical route, and enhancing the visibility of supply chain resources.

Fourthly, integration of sustainability performance metric where applicable; i.e., in public sector logistics contracts and evaluations is ensured continuous improvement act in

place as well as accountability. Central indicators of key performance relate to emissions of carbon, waste reduction, resource efficiencies becoming (KPIs) in evaluating logistics service providers and suppliers (Carter & Easton 2011). This thereby enhances some aspects of sustainable logistics effort by leveraging various stakeholders' expertise and resources.

Lastly, collaboration since the beginning was crucial to fostering, sustaining, and showing impacts stemming from sustainability initiatives. These collaborative approaches enhance the effectiveness while at the same time enhancing the impacts of such initiatives by leveraging all kinds of resources.

Incremental Scenario: Gradual Adoption And Continuity Improvement

In this scenario, little tasks instead of major transformations drove incremental adoption of sustainable logistics within the Greek public sector. Instead of big transformations, there focused on a few small steps that continue increasing sustainability practice within the public sector. Specific key actions entail:

Firstly, adopt measures incrementally starting off with low hanging fruit that includes but not restricted to energy efficiency improvements, waste cutting, and recycling inaugurations. Such tactics intend minimizing the environmental impact of logistics operation rather than contemplating quantification through large scales (Wang, Lin & Huang, 2014).

Secondly, capacity-building programs and training initiatives are developed to facilitate a deeper awareness and learning about the adoption of sustainable practices among the public sector workforces. Workshops, seminars, educational materials, eco-efficiency projects, and employee participation programs are adopted to empower employees with the necessary skills and understanding required to implement effective sustainability practices (McKinnon, 2010).

Thirdly across all sectors, it is a priority to integrate sustainability criteria into public procurement processes. The government incorporates environmental and social factors when selecting suppliers or service providers; this contributes towards developing market demand for green solutions by encouraging the adoption of green practices (UNCTAD, 2016).

Moreover, industry partners and service providers are collocated or worked with in collaboration to develop more sustainable supply chain practices. The public sector demonstrates great proximity to their logistics service provider partners to optimize transportation routes, reduce emissions and cooperate on shared services like pooling resources or consolidating shipments (Carter & Easton, 2011).

Lastly, incremental investment in digital technologies coupled with data-driven decision making is made to enhance operational efficiency in logistics operations and enable data-driven decision making and locally implemented innovations to improve upon efficiency in logistics operations. Public sector adopts technologies like transportation management systems (TMS), warehouse management systems (WMS) today and proposes using analytics tools and big data to boost efficiency in logistics operations (Zhong et al., 2017).

Status Quo Scenario: Limited Progress and Minimal Change

In this scenario, where progress towards integration of sustainability into logistics operation is limited. Sustainability considerations tend to remain secondary as practices focus primarily on traditional cost and efficiency metrics only. Key characteristics include:

Firstly, there are minimal efforts significant toward addressing sustainability issues. While there has been an increase in green procurement practices and sustainable technology adoption, these have remained secondary to the practice within the public sector. There

continues to be prioritization of cost savings and short tactical operational efficiency over long term sustainability consideration.

Secondly, investments in infrastructure upgrades or technological advancement for sustainable logistics are deficient. Limited financial resources means that the public sector cannot make significant investments for sustainable logistics infrastructure, technologies, and equipment.

Thirdly, training and capacity building initiative to promote awareness and knowledge about sustainable logistics practices among public sector employees is lacking. There is no emphasis on providing the necessary training and resources to empower employees to adopt sustainable practices in their day-to-day operations.

Moreover, there is absolutely no emphasis on reporting and monitoring sustainability performance. The reason being, lack of prioritization in measurement and reporting sustainability metrics, resulting in own inability to cater transparent accountability regarding sustainability of logistics practices.

Lastly, collaboration with external stakeholders such as industry associations or NGOs working on sustainable logistics is marginal at best. The public sector operates in isolation; poor level of engagement with external partners to leverage their expertise or resources for sustainability initiatives.

To shape a favorable trajectory towards Sustainable Logistics, it is of prime importance to focus on the log scenario called transformational or Incremental. These scenarios fully align with the growing global momentum towards sustainability offering opportunities from three cross-cutting areas and promise economic, environmental sociological gains. Efforts should be bolstered to set clear sustainability targets create supportive policy frameworks.

It is important to note though that choice of trajectory will be tied down to norms of political will, natural resource availability of that environment, stakeholder engagement and promises from other world chains. Nonetheless however, active pursuit of sustainability logistics practice by public sector would put up a contribution to greener society equivalent to that country environment.

8. Policy Recommendations for Sustainable Logistics in the Greek Public Sector

8.1 Institutional and Regulatory Reforms

In order to promote sustainable logistics in the Greek public sector, several institutional and regulatory reforms are necessary. These reforms can create a supportive environment, incentivize sustainable practices, and ensure accountability. The following policy recommendations are crucial for driving the integration of sustainability into public sector logistics:

Develop a National Sustainable Logistics Strategy: The Greek government should establish a comprehensive national strategy for sustainable logistics in the public sector. This strategy should outline the vision, goals, and objectives for sustainable logistics, providing a roadmap for implementation (OECD, 2019). It should encompass key aspects such as energy efficiency, emissions reduction, waste management, green procurement, and stakeholder engagement. The strategy should be developed through a collaborative and participatory process involving relevant stakeholders from the public sector, industry, academia, and civil society.

Strengthen Legislative Frameworks: The Greek government should review and strengthen existing legislation to support sustainable logistics practices in the public sector. This includes integrating sustainability criteria into public procurement laws and regulations. The legislation should require public sector organizations to consider environmental, social, and economic factors when procuring goods and services (Bartolacci

et al., 2016). It should also incentivize the adoption of sustainable technologies, such as electric vehicles and renewable energy sources, by offering tax incentives, grants, and subsidies.

Establish Green Procurement Guidelines: The government should develop and disseminate comprehensive green procurement guidelines for the public sector. These guidelines should provide clear criteria and specifications for sustainable products and services, including energy efficiency, environmental impact, and social responsibility (OECD, 2015). They should also emphasize the life-cycle approach, considering the entire supply chain and the environmental and social impacts associated with the products and services procured.

Enhance Collaboration and Partnerships: Collaborative efforts among public sector organizations, industry associations, research institutions, and civil society organizations are crucial for promoting sustainable logistics. The government should foster collaboration and partnerships to share best practices, exchange knowledge, and develop joint initiatives. Public-private partnerships can be established to leverage expertise, resources, and innovative solutions for sustainable logistics (Bansal, 2005). The government should also engage in dialogue with relevant stakeholders to understand their needs and perspectives, incorporating their inputs into policy development.

Promote Capacity Building and Training: The government should invest in capacity-building programs and training initiatives to enhance the knowledge and skills of public sector employees in sustainable logistics. Training programs should cover topics such as sustainable procurement, energy efficiency, waste management, and environmental impact assessment (UNCTAD, 2016). The programs can be delivered through workshops, seminars, online courses, and knowledge-sharing platforms. Additionally, the government

should promote continuous learning and knowledge exchange by establishing networks and communities of practice focused on sustainable logistics.

Establish Performance Monitoring and Reporting Systems: The government should require public sector organizations to establish performance monitoring and reporting systems for sustainable logistics. This includes setting key performance indicators (KPIs) to track progress and measure the environmental, social, and economic impacts of logistics operations (Walker & Di Sisto, 2015). Regular reporting on sustainability performance should be mandated, enabling transparency and accountability. The data collected can be used to identify areas for improvement, support evidence-based decision-making, and benchmark performance against national and international standards.

Provide Financial Incentives: Financial incentives can play a significant role in encouraging the adoption of sustainable logistics practices in the public sector. The government should explore the implementation of financial incentives, such as tax credits, grants, and low-interest loans, to support investments in sustainable technologies, infrastructure, and training programs (OECD, 2019). These incentives can help overcome financial barriers and provide a strong economic motivation for public sector organizations to transition towards sustainable logistics.

Raise Public Awareness and Stakeholder Engagement: Public awareness and stakeholder engagement are vital for the success of sustainable logistics initiatives. The government should launch public awareness campaigns to educate citizens about the importance of sustainable logistics and the benefits it brings. Engaging stakeholders through consultation processes, public hearings, and multi-stakeholder forums can ensure diverse perspectives are considered and foster a sense of ownership and support for sustainable logistics initiatives.

By implementing these institutional and regulatory reforms, the Greek public sector can lay the foundation for a sustainable logistics system. These reforms will create an enabling environment, incentivize sustainable practices, and drive the transition towards a greener and more efficient logistics sector.

8.2. Technological Innovations and Digital Transformation

Technological innovations and digital transformation play a crucial role in promoting sustainable logistics in the Greek public sector. Embracing advanced technologies and leveraging digital solutions can enhance operational efficiency, reduce environmental impact, and enable data-driven decision-making. The following policy recommendations focus on leveraging technological innovations and digital transformation to drive sustainable logistics:

Encourage Adoption of Green Technologies: The Greek government should promote the adoption of green technologies in public sector logistics operations. This includes incentivizing the use of electric vehicles (EVs) and alternative fuel vehicles (AFVs) by offering tax incentives, subsidies, and infrastructure support (Zhong et al., 2017). Developing charging infrastructure and providing financial assistance for EV adoption can accelerate the transition to cleaner transportation modes. The government should also encourage the use of renewable energy sources to power logistics facilities, such as solar panels and wind turbines, reducing reliance on fossil fuels.

Leverage Internet of Things (IoT) and Sensor Technologies: The government should support the deployment of IoT and sensor technologies to enhance visibility and traceability across the logistics network. IoT devices and sensors can monitor energy consumption, track shipments, optimize routes, and provide real-time data on vehicle performance (Zhong et al., 2017). This data can help identify inefficiencies, reduce energy waste, and optimize logistics operations. Public sector organizations should be encouraged to adopt IoT and

sensor technologies through funding programs, pilot projects, and knowledge sharing platforms.

Promote Data Analytics and Predictive Modeling: Data analytics and predictive modeling can enable evidence-based decision-making and improve resource allocation in logistics operations. The government should invest in data analytics capabilities and encourage public sector organizations to collect and analyze data related to logistics operations, such as transportation routes, fuel consumption, and emissions (Zhong et al., 2017). Advanced analytics techniques can identify patterns, optimize routes, predict demand, and support sustainability planning. The government should provide training and resources to public sector employees to enhance their data analytics skills.

Foster Collaboration and Interoperability: The government should facilitate collaboration and interoperability among public sector organizations, industry partners, and technology providers. The establishment of collaborative platforms and information-sharing networks can enable the exchange of best practices, data, and innovative solutions (Zhong et al., 2017). Public sector organizations should be encouraged to collaborate with technology providers and industry partners to develop interoperable systems and shared data standards. This collaboration will drive innovation, reduce duplication of efforts, and promote scalability of sustainable logistics solutions.

Support Digital Platforms and Marketplaces: The government should foster the development of digital platforms and marketplaces that connect logistics service providers, suppliers, and public sector organizations. These platforms can facilitate sustainable procurement, promote transparency, and enable the sharing of resources and services (Bastian-Pinto et al., 2018). By creating a digital ecosystem, public sector organizations can access a broader range of sustainable logistics solutions, optimize procurement processes, and foster competition among suppliers. The government should provide support in terms

of funding, regulatory frameworks, and awareness campaigns to promote the adoption of digital platforms.

Invest in Cybersecurity and Data Protection: With increased reliance on digital technologies, ensuring cybersecurity and data protection is critical. The government should invest in robust cybersecurity measures and develop data protection regulations that safeguard sensitive information (OECD, 2019). Public sector organizations should adhere to cybersecurity best practices, implement secure data management protocols, and educate employees on data protection policies. Additionally, the government should collaborate with international partners and engage in information sharing to address emerging cyber threats.

Promote Digital Skills and Training: To harness the benefits of technological innovations and digital transformation, public sector employees need to have the necessary digital skills. The government should invest in digital literacy programs, training initiatives, and capacity-building activities to enhance the digital skills of the workforce (OECD, 2019). Training programs should cover areas such as data analytics, IoT, cybersecurity, and digital project management. By equipping employees with digital skills, public sector organizations can effectively leverage technology to drive sustainable logistics practices.

By implementing these policy recommendations, the Greek public sector can leverage technological innovations and digital transformation to drive sustainable logistics. These initiatives will enhance operational efficiency, reduce environmental impact, and enable data-driven decision-making, leading to a more sustainable and resilient logistics sector.

9. Conclusion

9.1. Recapitulation of Key Findings

In this dissertation, we have undertaken a study aimed at understanding the state of sustainability in the Greek public sector from a logistical perspective. The objective was to

learn about current status, challenges and potential governing on integral sustainable practices within the domain of public sector logistics as well as make recommendations that may be implemented to reinforce efforts towards more sustainable practices going forward.

In the initial chapters, we established the foundation by providing both background and context for this study. We delineated importance of sustainability issues relating to the study area: their implications and rationales leading to their implementation with commitment to sustain them in place; and finally, outlined reforms and initiatives that were initiated by the Greek government during last decade or so. From the conceptual framework of the study, the aspects of relevance were fully understood evident from its flow throughout.

In the chapters focusing on Greek Public Sector, we grasped the organizational structure, functions, and major challenges faced by one's counterparts emanating out of various stakeholder groups. We discerned how they were characterized by limited resources, bureaucratic inefficiencies, other such factors pertaining to resistance to change. In addition, in line with recent developments, we equally examined global trends and highlighted the peculiarities witnessed around the world. This has been focused due to the undaunted nature of Greek people (Gidis, 2012).

Moreover, EU policies have affected the Greek public sector and their role in sustainability initiatives. When analyzed, we found that EU regulations and funding programs have played a big part in shaping how these initiatives are manifested (European Commission, 2019; Vlachos et al., 2021).

In the view of sustainability in the Greek public sector, we explored its evolution, current status, legal and regulatory framework, and case studies of sustainability practices. In this context, although there is progress, there is room for improvement. Particularly when it comes to strengthening the legal and regulatory framework to ensure compliance and

provide clear guidelines on sustainable practices. Case studies showed successful initiatives in areas such as waste management, energy efficiency, and green procurement (Charalambides et al., 2017; Karamanou et al., 2020).

Likewise, in the logistics perspective, scope was identified where logistics management exists, all its challenges, and opportunities in the Greek public sector, emphasizing on scale fragmentation, inadequate infrastructure, and an inadequate adoption of advanced technologies. However, we also identified opportunities in maximizing logistics efficiency through collaboration, technology adoption, and process optimization (Mentzas et al., 2017; Papadakis et al., 2021).

Global trends' influence on public sector logistics was explored hence drawing lessons from around the world regarding these figures' influence on public sector logistics. We found major current challenges linked to globalization; digitalization currently implementing numerous changes that will continue to grow, shaped by changing consumer behavior across geographies; and closely impacted by global economic scenarios presenting both perceivable challenges as well as opportunities. These scenarios supported our awareness while researching on public sector logistics – including growth location attractiveness – directed at delivering innovative solutions which can drive forward the dependability of public sector logistics' delivery performance (Tchouamou Njoya et al., 2019; Duan et al., 2020; Gössinger et al., 2021; Iacovidou et al., 2021).

As revealed in the international scenario analysis, the significance of setting up aggressive sustainability targets coupled with fostering greater collaboration among stakeholders, promoting innovation coupled with enhancing knowledge was identified as a key area in setting relevant policy frameworks. From past experiences, countries like Sweden, Germany, and The Netherlands prototype significantly enhanced Sustainability Management's Ecosystem Development Capacity. They implement innovative

arrangements in line with National/Local Initiatives such as: Green Procurement Policies and Eco-Drive Transportation Systems Collaboration Logistics Networks (Dekker et al., 2019; Gössinger et al., 2021; Iacovidou et al., 2021).

The event end highlighted the importance of developing a national strategy involving legislative reforms enhancement capacity building the business community's engagement leading to exploit lessons more effectively in guiding decision making synergy between policy implementation environments' consideration to raising awareness recognized achievements (Gupta & Arlbjørn, 2004; UNCTAD, 2016).

9.2. Implications for Future Research

Although this dissertation has given valuable insight into the topic of sustainability in Greek public sector from a logistical perspective, there are some avenues that need to be pursued. Exploring these avenues will broaden the understanding of the challenges as well as opportunities pertaining to integrating sustainability into public sector logistics. Here is an eyebrow-raising implication for future research:

Evaluation of Implementation through Policy Reform: Future research can concentrate on evaluation of the practice effects of policy reform in Greek public sector. This entails comparison and assessment of regulatory reforms like green procurement guidelines along with sustainability targets impact on the level of adoption of sustainable logistics practices. Through analysis of how policies are being implemented and their effects, researchers can provide recommendations relating to improving the effectiveness of policies (Koutsonas et al., 2019; Zervas et al., 2020).

Assessment of Technology Adoption: The next avenue of research would focus on assessing technological innovations impact on public sector logistics. This will require establishing technology implementations framework evaluating IoT technologies, sensor technologies, data analytics, along with digital platforms impacts on enhancing operational

efficiency and sustainability performance. Comparing comparative studies based on barrier and enabler technologies adoption in different public sector organizations can be done (Baraldi et al., 2019; Xu et al., 2021).

Long-term Sustainability Performance Measurement: Well-established long term sustainability performance measurement in public sector logistics needs more investigation. This avenue entails development of comprehensive frameworks and indicators for assessing impacts of logistics operations over longevity times to assess its environmental, social, combined impact. Longitudinal study can help analyze the impacts of sustainability initiatives, review where improvement is required, tracking the trend toward the aim of sustainability goals (Govindan et al., 2020; Sarkis et al., 2021).

Behavioral Aspects of Sustainable Logistics involved: A fruitful area of future research involves understanding behaviorally aspects while studying such areas in identifying the drivers and barriers that employee, stakeholders across the organization adopt and implement sustainable practices. Qualitative research methods will involve conducting interviews, taking knowledge from organizational sources, documents, etc to create deeper understanding about behavior dynamics around sustainability. This includes companies, government agencies, industry association, NGO, local community, etc (Borgatti et al., 2018; Wagner et al., 2020).

Multi-stakeholder Collaboration and Governance: Exploring the Drivers and Barriers of Multi-Stakeholder collaboration and governance impact on driving sustainability is an important avenue for future research. This will seek examining collaborative processes and governance structures regarding multi-stakeholders roles–responsibilities power dynamics including regulators unions and employers’ federation–industry associations or federations GPNEA professionals trade unions amongst others (Eisenhardt & Graebner, 2007; Seuring & Gold, 2012).

Sustainable Logistics in Specific Public Sector Domains: There are several specific public sector domains that need exploring such as healthcare education or waste management. These sectors often have unique logistics requirements along with challenges. Focusing on certain domain will help determine sector-specific sustainability practice identify best practice evaluate effectiveness extrapolate milestones attained Exploration along with Critical zone of multiple stakeholders and leadership for sustainable logistics in those selected Areas (Rahman et al., 2019; Schoenherr et al., 2021).

9.3. Final Remarks

Finally, in closing this dissertation on sustainability in the Greek public sector from the perspective of a logistical study, it is necessary to reflect upon the key findings and implications stemming from the investigation. The research has deepened our understanding of the current status, challenges, and potential associated with integrating sustainability practices into public sector logistics in Greece. In this last part, we shall summarize the main findings and discuss their significance as well as highlight the implications for future practice and research.

One of the major findings in this dissertation regards the integration of sustainability principles regarding the Greek public sector. Sustainability principles have become essential in addressing environmental concerns, supporting operations, and enhancing service delivery, and caring for various stakeholders' expectations. Sustainable logistics initiatives not only reduce the adverse impacts on the environment but also have the potential to generate cost savings, improve the quality of services being delivered, and contribute towards raising aggregate performance standards across public sector organizations (Walker et al., 2014; Carter & Rogers, 2008).

During this evaluation, there emerges several challenges faced by the Greek public sector in embracing sustainable logistics practices. Rather, these are considerable barriers such as limited resources, bureaucratic inefficiencies, and resistance to change. Nonetheless, it is encouraging to note that the government of Greece has initiated reforms and implemented inception plans aiming at achieving improved efficiency and effectiveness of the public sector. Thus, these efforts show a growing weariness or recognition relating to sustainability and its alignment with national and international sustainability goals (Koutras et al., 2020; Laliotis et al., 2020).

Another significant finding emanates from this dissertation related to the influence of EU policies toward the sustainability practices prevailing in the Greek public sector. Emphasis has been placed on exploring how the developments in EU policy settings have played an important role in shaping sustainability initiatives within Greece. This happened through facilitating green procurement practices, acquisition of environmental standards, benefit for new initiatives relating to sustainability, and concerted effort to integrate these developing concepts into public sector logistics (European Commission, 2018; Vlafos et al., 2021).

In turn, there are particular implications toward both practice and research. From a practical point of view, it is imperative to put measures derived from this study into action. Institutional and regulatory reforms should be pursued further to strengthen the legal framework and create an enabling background associated with sustainable logistics practices. Technological innovations demonstrate effective use of digital tools along with advanced analytics to enhance logistics efficiency thereby assisting managers in making decisions concerning sustainable decision execution. On the other hand, capacity building initiatives and engagement of stakeholders are imperative as they relate to fostering a culture of

sustainability hence collaboration among different segments including industry partners, civic society can be fostered (Katsoulakos et al., 2020; Walker et al., 2019).

The behavioral aspects of sustainable logistics; comprehending the dynamics relating to multi-stakeholder collaborations; identification of opportunities conducting comparative studies with other countries regarding the identified themes constitute another important implication moving ahead. Such direction of research inquiries will bring valuable insights pertaining to managerial views, practitioners' perspectives pertaining to advancing their organizational smarts toward sustainability.

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Υπέθυνη Δήλωση Συγγραφέα:

Δηλώνω ρητά ότι, σύμφωνα με το άρθρο 8 του Ν. 1599/1986 και τα άρθρα 2,4,6 παρ. 3 του Ν. 1256/1982, η παρούσα εργασία αποτελεί αποκλειστικά προϊόν προσωπικής εργασίας και δεν προσβάλλει κάθε μορφής πνευματικά δικαιώματα τρίτων και δεν είναι προϊόν μερικής ή ολικής αντιγραφής, οι πηγές δε που χρησιμοποιήθηκαν περιορίζονται στις βιβλιογραφικές αναφορές και μόνον.