# The Impact of Logistics Management & SDGs (Sustainable Development Goals) to Improve the Food Supply in Egypt [1]

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## ABSTRACT

*As a result of this research, we will be discussing the Sustainable Development Goals (SDGs), specifically the second goal (zero hunger), as well as the causes of hunger around the world, particularly in Egypt, in order to find suitable solutions to the major connection problem that the ministry is experiencing, which has an impact on the quality of service provided by the ministry to Egyptian citizens. It is discovered in the study how the newly created logistics centers played a critical role in enhancing food supply and lowering the number of defective products on the market. Furthermore, it regulates the process of storing products in order to preserve goods and offer highly qualified goods to Egyptian people by lowering the defect rate of the items and improving all logistical operations in order to give highly-qualified goods to Egyptian citizens. Finally, it offers software in order to enhance communication between the market, the Ministry of Supply and Internal Trade, and the distribution and logistics facilities. To sum up, no doubt that preparedness makes governments strong enough to deal with any shocks or sudden changes in the demand that may occur. The Egyptian government was well prepared before the shock of the COVID-19 pandemic, which considers the enabler for the Egyptian government to provide all essential commodities such as sugar, rice, and cooking oil without any shortage even when the trade was restricted. The logistics centers played a vital role in this process since they consider the backbone of the foods supply across Egypt during the pandemic using different logistics techniques even after the pandemic. Since it stores the goods which sufficient for months. In addition, according to the questionnaire people proofs that the logistics centers are doing well. Finally, Egypt is doing well in the process of the food supply but more investments need in order to improve the service quality and reduce the costs.*

***Keywords:*** *SDGs, logistics Management, Food Supply in Egypt*

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## 1. INTRODUCTION

Over the last several decades, the flow of products, as well as the variety of commodities available, have increased substantially. In recent years, international trade and product transportation have grown at a faster rate than the increase of a country's gross national product (GDP) (Curtis, 2003). In 2007, commodities transported by road increased from 304 million tons in 2003 to 353 million tons in 2007, reflecting a 16 percent increase over the preceding five-year period, according to the Egyptian statistics agency (Eurostat, 2009). Increasing international trade in food from distant sources has led in an increase in the distance and amount of food transportation around the world in recent decades, as has the number of people who consume food from distant sources (Ljungberg et al., 2006). The distance traveled by food in the U.K had increased by 50% and the distance traveled by food in the United States had increased by 25% between the 1980s and the beginning of the twenty-first century, respectively (Halweil, 2002).

Even the mobility of animals inside Europe is significant. In 2000, over 365 million farm animals were transported yearly throughout the 15-member countries of the European Union (EU), with trucks accounting for approximately 67 percent of all such transports, according to (Ljungberg et al. 2007). According to the United Nations, the total number of animals transported annually may have increased to around 475 million for 27-member countries in recent years (Gebresenbet et al., 2010).

The environment is impacted by the increase in the volume and distance that food and animals travel to reach the market. Transport-related greenhouse gas (GHG) emissions linked with worldwide energy consumption account for roughly 25% of overall GHG emissions from the sector, with road transport accounting for approximately 75% of total GHG emissions from the sector (IPCC, 2008; Määttä-Juntunen, 2010). As predicted by (Ntziachristos et al., 2002), total $CO_2$ emissions from all vehicle types in Egypt would grow from 18.5 million tons in 1998 to 25 million tons in 2020, indicating that the freight transportation sector's contribution to global warming will increase. It is recommended by (Jaradat, 2010) that greater attention be made to reducing emissions from the transportation sector (which includes agriculture-related transportation). reducing the amount of pollution produced by transportation

More study into logistics-related activities in the agricultural business, particularly food logistics at the level of the local food supply chain (LFSC), is required in order to attain this aim. Food logistics at the level of the local food supply chain (LFSC) is one example of this.

Additionally, an increase in food transit may have a negative influence on the quality, safety, security, and traceability of food, as well as having a negative impact on costs and the environment. Food transit is becoming more common. According to the findings of research conducted by (Ljungberg and colleagues 2006), more than half of the respondents thought that there was a problem with traceability in the food supply chain within Egypt's agricultural economy. Recent advances in the agricultural business have underlined the need of tracking slaughter animals from their conception through the completion of their products, as well as tracking the movement of food across borders (Smith et al., 2005). Over the last few years, the food supply chain as a whole has come under increased scrutiny. This is primarily due to the growing concern about food transportation and its associated environmental impact, logistics costs, and animal welfare issues; the growing concern about food safety and quality issues; the declining consumer interest in chemical-based food production; and the growing public awareness about sustainable food production, processing, and transportation. A new generation of LFSCs is emerging as an alternate food supply system as part of the efforts to address these issues. There is an increasing demand for locally sourced food, but one of the most major challenges confronting local food systems is logistics. A thorough examination is required in order to identify key bottlenecks and develop strategies for overcoming these concerns. It is also necessary to build effective and efficient logistics systems for LFSCs. There have been few and few between research projects targeted at improving the logistical performance of local food systems to this point in time. This thesis has the potential to make substantial contributions to the field of local food logistics, even if the concept of local food logistics is still in its infancy. It will do so by improving the logistical performance of local food producers and distributors (Marwa and Abdel Ghany, 2021).

## 2. RESEARCH PROBLEM

A number of factors influence logistics performance, including obtaining the anticipated output with the least amount of resources, logistics effectiveness (obtaining the greatest percentage of the expected output), and logistics competence (being competent by achieving the best comparable net value) (Fugate et al., 2010). Logistics management is always evolving as a result of the dynamic nature of the global market, the improvement of communication and transportation technologies, and the shifting requirements of customers (Simchi-Levi et al., 2005). A management challenge such as "what proportion of consolidated distribution centers (DCs) should be put in which areas" is one that must be solved since effective logistics management is crucial to a company's survival (Oum and Park, 2003). Such significant logistical problems should be raised and studied in the context of LFSC, which is characterized by inefficient and fragmented logistics activities (Saltmarsh and Wakeman, 2004). It is possible to have inefficiencies with food logistics in the areas of quality control, packaging, labeling, traceability, information technology (IT) use, and the purchase and utilization of storage and cold chain facilities, among other areas. Most recently, food firms in the EU placed a strong emphasis on logistics management in order to preserve a competitive advantage in a global market where the EU has dominated as the world's leading producer of food and beverages for more than a decade (Mangina and Vlachos, 2012).

## 3. RESEARCH IMPORTANCE

As a result of the current food supply chain trend, farms, food industries, and wholesalers are being concentrated into a smaller number of large organizations; supply chain management is being integrated; consumers are demanding higher levels of quality, safety, and security from their food sources; and the general public is becoming more aware of environmental and animal welfare issues (Opara, 2003; Groom, 2011). Consider the fact that the food industry accounts for around 15-20 percent of total energy consumption in Egypt, indicating that the country's food production and distribution systems require greater focus (Wallen et al., 2004). The decrease in the use of fossil fuels in the production and distribution of food, notably in the agricultural sector, makes a significant contribution to greenhouse gas reduction. The fact that transportation has a

modest influence on the overall environmental impact of the food supply chain should not be overlooked because food transit is becoming increasingly common in contemporary food supply networks (Nordmark, 2012). Because of the increase in transportation distance, there is an increase in food quantity, quality, and safety losses. However, depending on the mode of transportation utilized, the kind of product transported, the road network in use, and the surrounding environment, the amount of the losses may vary. Generally speaking, because the food sector contributes so much to a country's economy, food logistics operations should be investigated and improved on a constant basis as a general rule (Gebresenbt and Oodally, 2000). An investigation of the use of LFSCs should take into consideration the cases of such use. Local food producers can become more competitive in the market (Gimenz, 2006) by integrating their logistics activities with those of distributors and consumers through effective LFSC management. This will allow them to meet the growing demand for local food products and to improve the sustainability of local food systems (Zarei et al., 2011).

## 4. RESEARCH AIMS

In the logistics information system, the Internet of Things is mainly used in the following four areas:

(1) Multi-source logistics information collection and tracking system based on RFID and other skills. For example, when envisioning the container logistics system for the collaborative management of the whole process, the container goods supply chain from the supplier to the order side are acceptance of the supplier's goods → road transportation → customs clearance of the exporting country → sea transportation or multimodal transportation → customs clearance of the importing country → Land Transportation → Delivery of goods to the order. Electronic tags are attached to each container, and by combining RFID and GPS skills, monitoring of the entire supply chain can be achieved. After receiving the radio frequency tag information of the container, the receiver uploads it to the communications satellite with the received location information and then transmits it to the port logistics funnel center from the satellite to provide a basis for the cooperative management of the port supply chain.

In the whole process of container transportation, the container is under strict control from start to finish, thus ensuring the safety of container transportation.

(2) Visual management system for logistics distribution operations. The Logistics Distribution Visual Management System can track the whole process of the goods by using RFID electronic tags in the logistics distribution process.

(3) Establishment of a fully automated logistics distribution center. A fully automated logistics distribution center realizes the comprehensive integration of information flow, material flow, and capital flow in e-commerce. The fully automated logistics distribution center should include afully automated three-dimensional warehouse, automatic feeding system, automatic sorting system, automated palletizing system, etc., which can realize the automation and intelligence of logistics management.

(4) By integrating GPS/GIS skills and MIS logistics, mobile indicator monitoring can be achieved. For example, the vehicle monitoring and management system select advanced GPS positioning, data communication, electronic maps, and database skills to apply effective management, full-scale monitoring, anti-theft and anti-theft, vehicle search, and driving instructions for transportation vehicles.

## 5. RESEARCH QUESTIONS

5.1 what is your evaluation concerning the investment in the food sector?

5.2 does the recent ministry projects improve food security for citizens?

5.3 did the warehousing and silos latten projects reduce waste and preserve goods safety?

5.4 did the warehouses help in cost reduction?

5.5 does the newly established logistics centers enhance food products delivered to the citizens?

5.6 does the packaging material ensure goods' safety and quality?

5.7 does the latten ministry's project helps to achieve sustainable development goals for 2030? in addition, it economic, social, and environmental dimensions?

5.8 does the supply chain helps the ministry to meet the demand of the food commodities in the high demand seasonality?

## 6. MATERIALS AND METHODS

This study aims to identify the interrelationships between the SDGs from an academic context through a comprehensive review of the SDGs. Papers published from 2015 to 2020 were collected through four databases to identify the interrelationships between the SDGs through a comprehensive review of academic journal articles to interpret, understand, and explore concepts within the current literature in FSCs. Due to the academic and managerial value of this field of research,

This involved four steps, which included:

- Identification of research questions;
- Designing of inclusion and exclusion criteria;
- Conducting the review through the selection of relevant databases, collecting of academic studies using specific search strings
    - To carry out this research, we used secondary data from the Logistics Performance Index (LPI) by the World Bank and SDGs scores.
    - As data do not fulfill Pearson's assumptions, particularly the normality distribution, we used a non-parametric test of association between two variables.
    - Accordingly, data were analyzed using Kendall's tau-b (τb) correlation coefficient in SPSS®.

## 7. RESULTS ANALYSIS

GPS and GIS play a major part in creating efficient transportation systems because of their reliance on sophisticated information technology. There were a number of places where GPS was used, such as depots and retailers, places where vehicles began and stopped for the purpose of loading or unloading cargo, and food collecting and distribution routes that were recorded. The primary tools for analysis were Route Logix, ArcGIS, and Spreadsheet. Route Logix's vehicle routing and route optimization capabilities are among its most impressive features (DPS, 2004). Various businesses, notably Swedish food retailers, make

use of its capability of forming the most efficient routes by reducing trip distance and duration. Route LogiX's restriction is that it can only design a single route at a time in the current version.

This research made extensive use of ArcGIS software. Farms, delivery sites, CCs, and DCs were all mapped using ArcMap. ArcGIS network analyst tools including the VRP solver, route solver, and nearest facility solver were utilized to design and map the most efficient routes (ESRI, 2008). Creating a road network dataset and preparing a spatial database in a GIS environment is required for these ArcGIS tools (see Figure). A study of scholarly articles and other materials on food traceability that were published between the years 2000 and 2013 focuses on the following questions: In other words, what does the term "food traceability" mean? To what extent are food businesses motivated by and challenged by the deployment of traceability systems? Are there any developments in food traceability technology that I should be aware of? Food traceability systems have many advantages. When it comes to LFSC's food traceability system, how does it work? For example, driving factors, obstacles, definitions, technical advancements, anticipated benefits, performance, and improvement are all shown in Figure 6. The breadth of the literature study (Paper I) is also shown in Figure 6. It was found, analyzed, and discussed that each of these problems had been looked into.

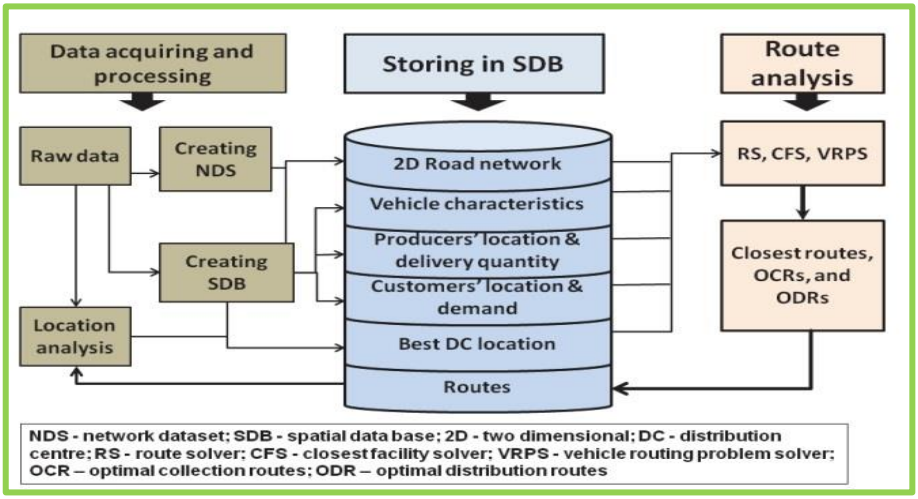


**Figure 1: An example of how ArcGIS Network Analyst Tools are used to process and analyze data**

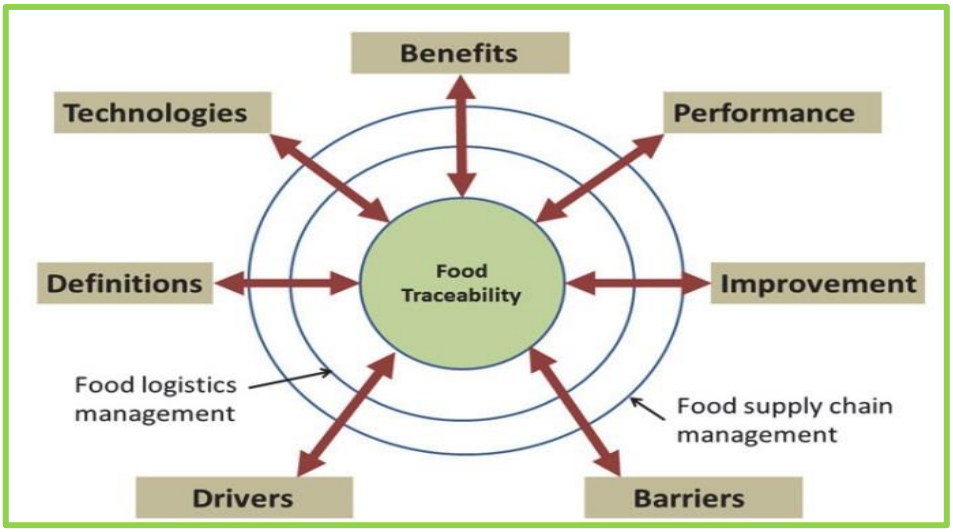


**Figure 2: A paradigm for understanding the breadth of the food traceability literature review**

The governorates were classified according to the population density into the following: (three different categories according to their capacity of citizens)

- The first is called the governments with high citizen's capacity which cities contain many peoples such as Cairo, Giza, and Qalyubia.
- Second is the medium capacity government such as: Gharbia, Alexandria, Dakahlia, Monufia, Damietta, Sharqia, El-Beheira, Faiyum, Port Said, Luxor, Sohag, Qena, Beni Suef, Ismailia, and Minya.
- Finally, the low capacity governments which have a small number of citizens such as: Suez, Kafr El-Sheikh, Aswan, North Sinai, South Sinai, Matruh, Red sea, and New Valley.

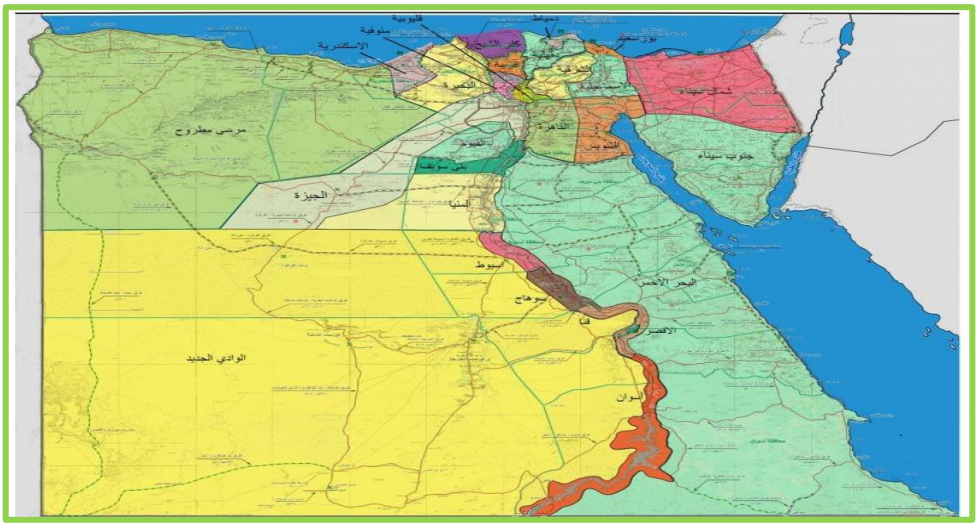


**Figure 3: Egypt's Map**

## 7. 1 Cairo government

This is the capital of Egypt and the most important city it has the largest number of citizens across Egypt and the most important activities that Egypt depends on it. The main activity is the manufacturing activity that considers the core of activities besides little tourist activities.

**Table 1: Government information of Cairo**

| | |
|---|---|
| Total area | 1.881.04 $KM^2$ |
| Number of citizens | 8.835.614 |
| Population density | 4.697/$KM^2$ |
| The main activity | Manufacturing |
| Number of manufacturing facilities | 3 manufacturing districts and 8,150 factory |
| Family's average income | 36.602.6EGP/year |
| Individuals share of the income | 9.342EGP/year |

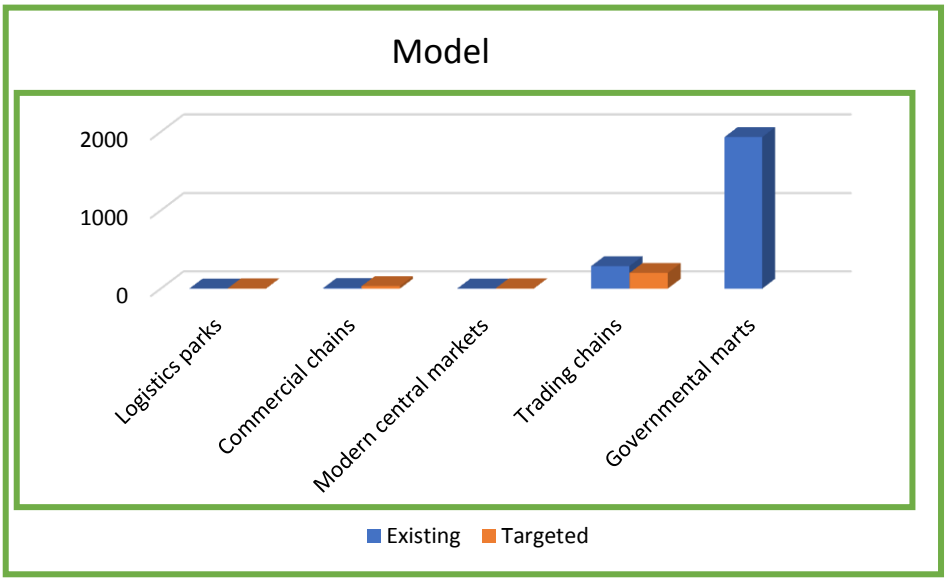


Figure 4: logistics center information of Cairo

## The main existing retailers:


Figure 5: The main existing retailers in Cairo

Figure 6: Cairo's Map

## 7. 2 Alexandria government

Is one of the major governments that exist on the borders of Egypt and it on the Demitarian Sea and considered the second government that contains a large number of citizens? It depends on tourism and manufacturing industries as the main activities exist inside the city.

**Table 2: Government information of Alexandria**

| | |
|---|---|
| Total area | 2.300 $KM^2$ |
| Number of citizens | 4.564.979 |
| Population density | 1.984 /$KM^2$ |
| The main activity | Manufacturing |
| Supporting activity | Tourism |
| Family's average income | 33.678.6EGP/year |
| Individuals share of the income | 8.484EGP/year |

**Table 3: Logistics center information of Alexandria**

| The model | Existing | Targeted |
|---|---|---|
| Logistics parks | ———————— | 2 regional and 1Harbour |
| Commercial chains | 5 | 16 |
| Modern central markets | 2 will be upgraded | 1 |
| Trading chains | 52 | 180 |
| Governmental marts | 1.324 | ———————— |

## 7. 3 The main existing retailers


**Figure 7: The main existing retailers in Alexandria**

**Figure 8: Alexandria's Map**

## 7. 4 Giza government

This government is an important government that contains both tourism and manufacturing activities which means that it has a good income and it has a large share in the Egyptian economy.

**Table 4: Government information of Giza**

| | |
|---|---|
| Total area | 121 $KM^2$ |
| Number of citizens | 7.087.396 |
| Population density | 58.573 /$KM^2$ |
| The main activity | Around 60.5% of it depend on agriculture |
| Number of manufacturing facilities | 7 manufacturing districts and 755 factory |
| Family's average income | 22.984.1 EGP/year |
| Individuals share of the income | 5.332.5 EGP/year |

**Table 5: Logistics center information of Giza**

| The model | Existing | Targeted |
|---|---|---|
| Logistics parks | ——————— | 2 Regional logistics parks and 1 Hub logistics park |
| Commercial chains | 3 | 29 |
| Modern central markets | 1 | 2 |
| Trading chains | 134 | 120 |
| Governmental marts | 2,260 | ——————— |

## 7. 5 The main existing retailers


Figure 9: The main existing retailers in Giza

Figure 10: Giza's Map

## 7. 6 Port Said Government

It is also one of the governments that occurs on the meditation sea and it has one of the important free trade areas in Egypt it is a little bit smaller in area than Alexandria and Cairo but it is one of the important governments in Egypt.

Table 6: Government information of Port Said

| | |
|---|---|
| Total area | 1.344 $KM^2$ |
| Number of citizens | 633.905 |
| Population density | 471 /$KM^2$ |
| The main activity | Manufacturers |
| Supporting activity | 11 Manufacturing districts and 340 factory |
| Family's average income | 30.355EGP/year |
| Individuals share of the income | 8.215EGP/year |

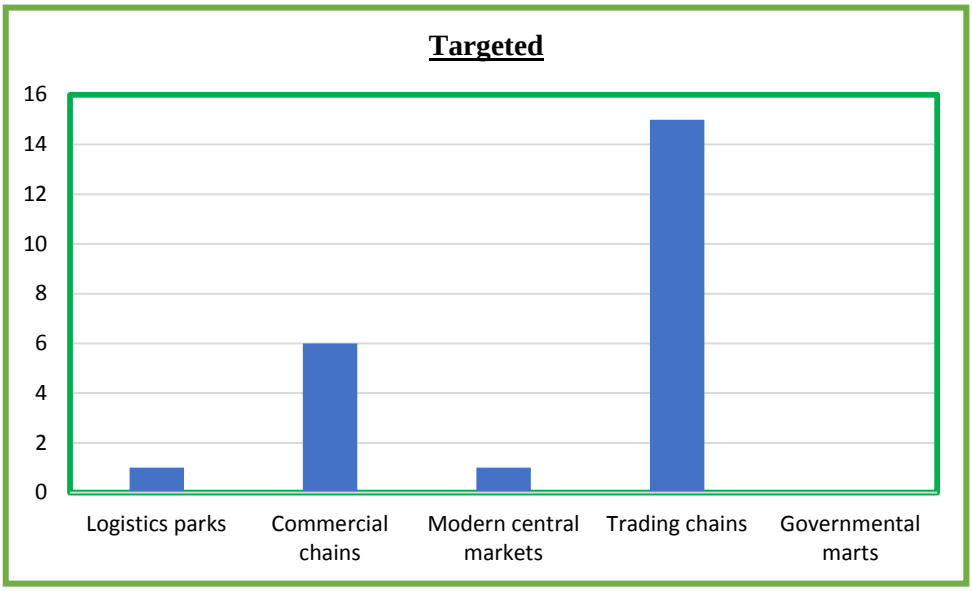


Figure 11: Logistics center information of Port Said

## 7. 7 The main existing retailers


Figure 12: The main existing retailers in Port Said


Figure 13: Port Said's Map

## 7. 8 Data Analysis

The research questions were answered using a three-answer Likert, which consisted of 100 questionnaires, and only 86 were correct, and their answers were according to the triple Likert analysis as follows:

- (sufficient- average- not enough)
- or (yes- no- maybe)

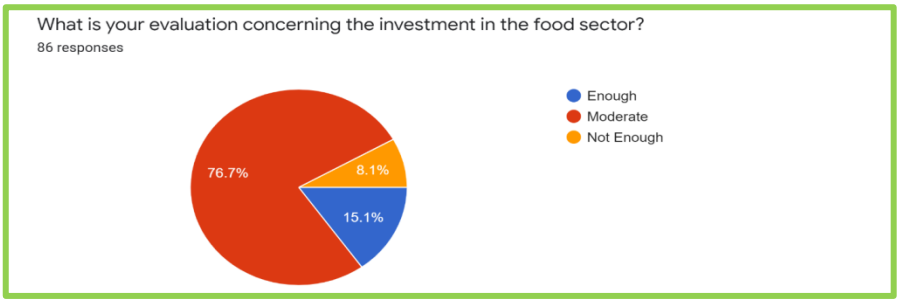


**Figure 14: Question 1 answers, Source: Questionnaire**

Most of the people have voted for moderate, which means that more investments need to be invested in the food sector in order to improve the infrastructure of the development system. The investment must include available food value, as a result of these investments food quantity available in the market will increase, which enable the country to gain new export markets.

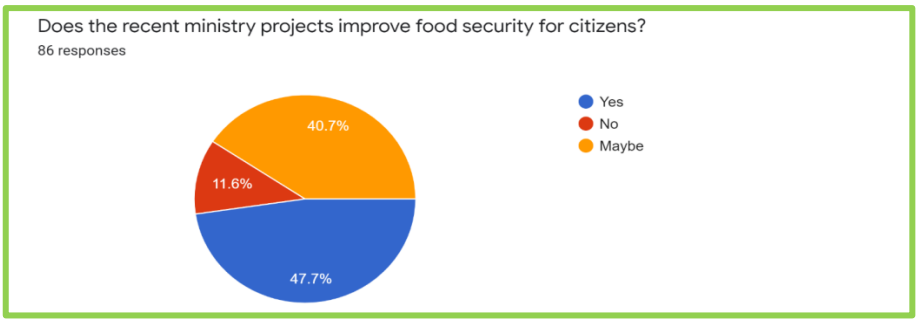


**Figure 15: Question 2 answers**
Source: Questionnaire

Most people voted for yes since they find out that the goods available in the market have increased. As a result, the prices of the goods have decreased. Moreover, the ministry's investments were around 50 billion EGP invested in order to increase the storage capacity from 2.1 million tons to 2.4 million tons in the last 4 years.

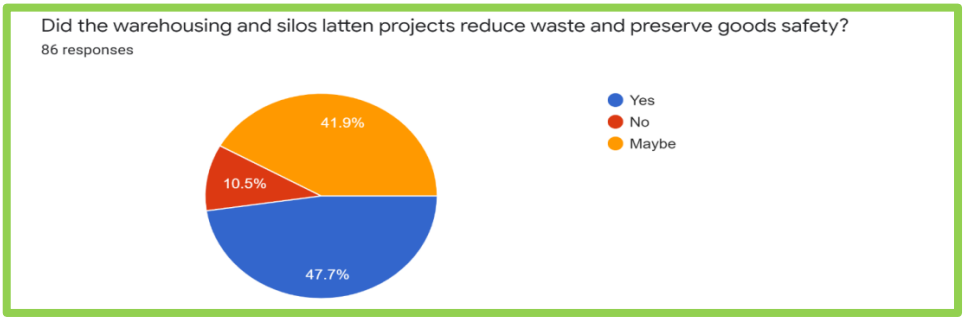


**Figure 16: Question 3 answers**

Source: Questionnaire

The majority of participants find out that the different projects settled by the ministry help in preserving foods and the products are kept well which means that the latter ministry's project played important role in preserving goods.

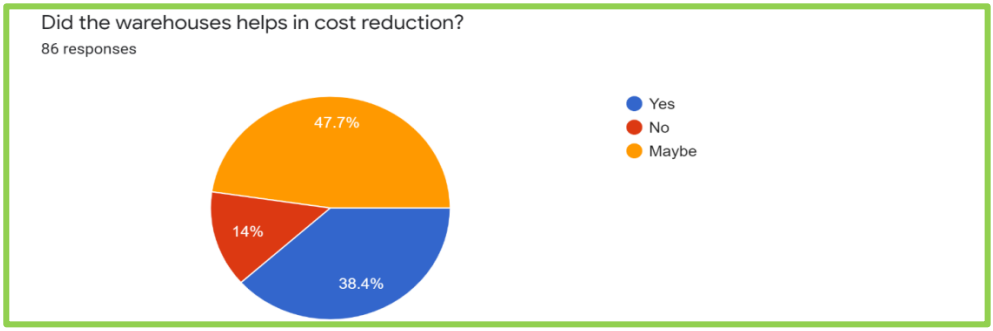


**Figure 17: Question 4 answers**

Source: Questionnaire

Those who vote maybe, they believe that the warehouses played a critical role in providing goods, but on the other hand it leads to some increase in the cost of the final product. Therefore, they see that much work is needed in order to reduce the cost.

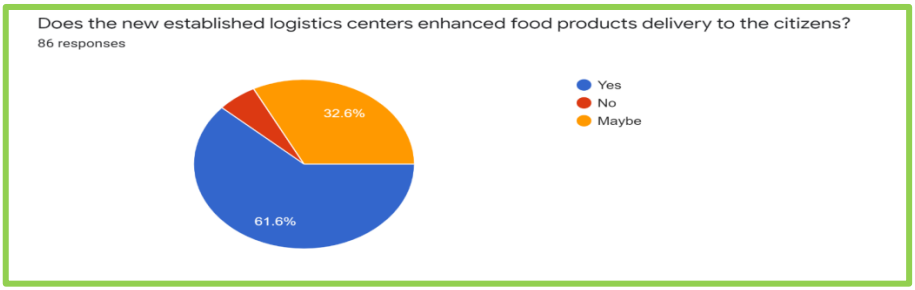


**Figure 18: Question 5 answers**

Source: Questionnaire

The majority of people find out that logistics centers played a critical role in storing and delivering goods with the best available quality and very low defect rate.


**Figure 19: Question 6 answers**

Source: Questionnaire

Most of the people have voted yes since they find out that the packed product is safe and do not have a high defect rate, due to the packaging techniques followed by the logistics centers that have an important role in keeping goods safe and the quality of the goods remain the same.

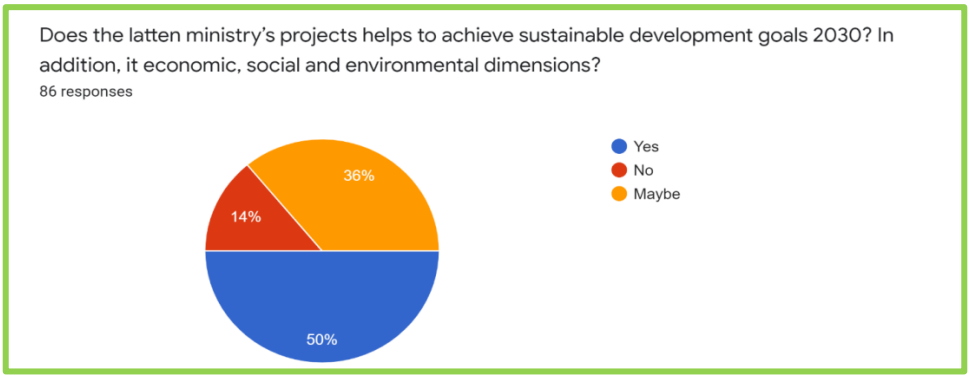


**Figure 20: Question 7 answers**

Source: Questionnaire

The majority of people find out that the strategies set and applied by the ministry aim to provide projects that give the highest economic return, and it helps to keep people happy. Finally, the project helps to keep the environment safe from any harmful effects, such as pollution.

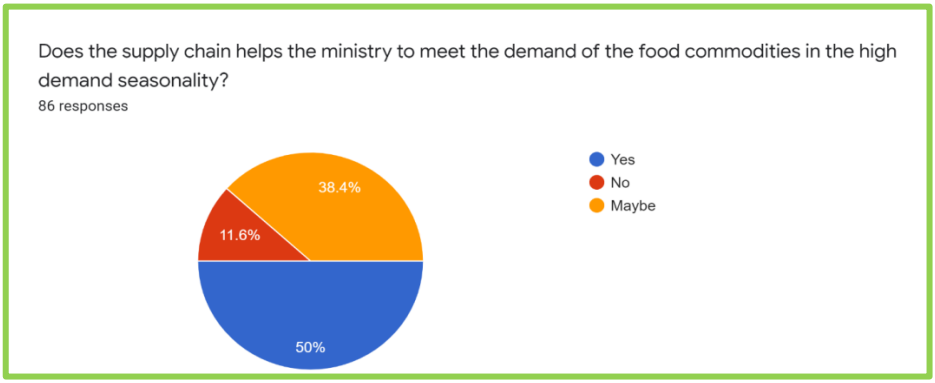


**Figure 21: Question 8 answers**

Source: Questionnaire

Most of the people have voted yes, which proves that the entire supply chain of the ministry helps to meet customer needs. The supply chain depends on spreading the logistics centers across Egypt which improves providing goods in the right place, right time, right quantity, right quality, and the right price.

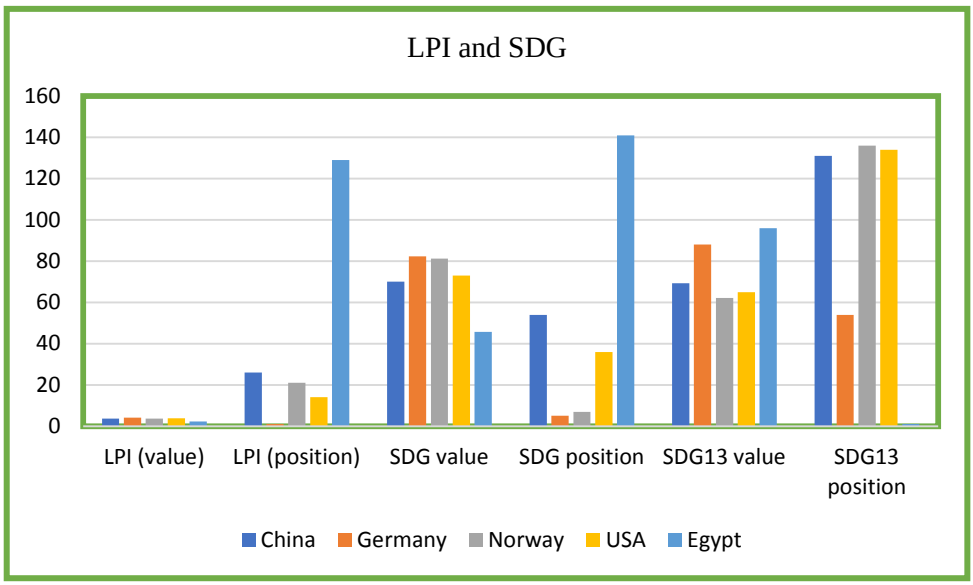


**Figure 22: LPI and SDG**

## 7. 9 Logistics Performance Index (LPI)

- LPI was created to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance.
- The LPI 2018 allows for comparisons across 160 countries.
- The LPI is based on a worldwide survey of operators on the ground (global freight forwarders and express carriers), providing feedback on the logistics "friendliness" of the countries in which they operate and those with which they trade.
- They combine in-depth knowledge of the countries in which they operate with informed qualitative assessments of other countries where they trade and experience of global logistics environment.
- Feedback from operators is supplemented with quantitative data on the performance of key components of the logistics chain in the country of work.
- Logistics Performance Index (LPI)

The LPI consists of both qualitative and quantitative measures and helps build a profile of logistics friendliness for each country.

The international LPI is a summary indicator of logistics sector performance, combining data on six core performance components into a single aggregate measure, rated from "very low" (1) to "very high" (5). These are:

- The efficiency of customs and border clearance.
- The quality of trade and transport infrastructure.
- The ease of arranging competitively priced shipments.
- The competence and quality of logistics services.
- The ability to track and trace consignments.

The frequency with which shipments reach consignees within scheduled or expected delivery times. This one rated from "hardly ever" (1) to "nearly always"

Logistics activities are closely related to the achievement of the SDGs.

- Some of the correlations deserve further exploration. For instance, SDG2 (zero hunger), SDG3 (good health and well-being for people), SDG8 (decent work and economic growth), and SDG11 (sustainable cities and communities).
- There is a significant negative correlation between LPI and SDG13 (Climate change).
- This suggests that in more developed countries, as LPI increases less progress towards the SDG13 is shown.
- It also might be the case that some of the countries' behaviors are affecting others' performances. For instance, big economies that are not contributing with effective actions against climate change may impact the outcome of more conscious countries with smaller economies, or simply poorer.

## 8. CONCLUSION

To summarize, the UN's sustainable development objectives, which must be met by 2030, are critical for the planet's well-being and our own. They may be used as a guideline for countries all over the globe when making choices to improve living conditions and protect their people. Furthermore, these objectives may assist nations that want to protect the environment so that future generations will be able to enjoy a healthy world and its inhabitants for a long time to come. These objectives also assist the country's inhabitants to enjoy a higher standard of living through cooperating with people in other nations to share their expertise and apply it to the country's aims.

There are also nations that suffer from huge difficulties and conflicts as a result of hunger. Some countries that suffered from hunger in the past are today countries with a poor worldwide presence and suffering from many problems and wars as a result of hunger. Because they want to help their people meet their fundamental requirements, including food. With lockdown and movement restrictions following the coronavirus pandemic, the world's hunger problem worsens, resulting in a drop in global trade. Many nations who failed to prepare food reserves suffered even more than those who did, such as the United States after the coronavirus hit the country and even after the lockdown because they failed to prepare. Even in nations where hunger was always a problem, it has

become worse since the virus spread, and the country was put under lockdown. In contrast to other nations, Egypt's government believes it has not experienced any hunger or food insecurity issues since the epidemic. Egyptians usually stockpile food in strategic warehouses to avoid a food shortage on any of the country's most important food commodities, all of which contribute to making more food readily available. While sugar, rice, and other staples like them were in limited supply in the Egyptian society's food system in the past, Egypt is now focusing on stockpiling vital commodities like those. Following the shortfall, they devised a strategy to figure out precisely what they need to do to avoid future shortages. Consequently, the Egyptian government, in particular the Ministry of Supply and Internal Trade, sees no food shortage issue in Egypt. The government believes it has already resolved the country's food and commodity shortages.

Egypt's food logistics center, on the other hand, is critical to ensuring that the country never faces a food crisis. The Egyptian government has long recognized logistics' significance, but only in the last several years has it made significant progress in establishing a domestic logistics system and ensuring food security at home. They handle, package, and offer temporary storage away from any factors that may contribute to product fault or loss, as well as all the fundamental activities required to keep food supply. The available supply would be adequate for Egyptian society for a long time, and it would be maintained in good shape to prevent it from becoming defective. This would be a significant benefit to Egypt. They also play an important role in packing and transportation, ensuring that the products remain secure until they reach their final destinations, as well as ensuring that the quantity of lost goods is minimal and working to reduce waste as much as possible. To make it even more widely available, make sure it's distributed to shops throughout the nation. Finally, merchants keep it in good shape so that they may sell it to the general public.

But in the process of supplying food, the logistics centers are confronted with major challenges that seriously jeopardize market supply or even cause a food scarcity, both of which would strain relationships between organizations responsible for supplying food to people. Since this issue may lead to excess inventory being stored, it has a significant impact on the ministry's overall performance. This in turn increases storage costs, which in turn raises the price of

the goods provided. Furthermore, since the stored commodities are foods, keeping them for an extended period of time may result in the destruction or scarcity of these items. Due to a lack of necessary communications, the logistics centers are unable to access market information or control supply, which means that the ministry of supply and internal trade cannot monitor or manage supply. As a result of this, the ministry may believe there is a shortage of products when in fact none exist, sending false signals to the ministry of supply that they must make purchases of certain products or factories producing these products are insufficient, while in fact, they are already in stock. This may imply, incorrectly, that they need to expand the number of factories and planted areas or improve the output capacity of the factories or planted areas. Instead of sending signals to the ministry that specific goods are accessible in warehouses and may be made available to the market as required, they may really be unavailable in key warehouses as well as the warehouses of retailers.

## 9. RECOMMENDATIONS

- Instead of reinventing the wheel, we provide an efficient approach that saves time and money while also improving information exchange across the supply chain. As a result of this approach, all parties involved in food supply planning and operation, as well as those involved in food distribution, may work together to ensure food security.
- Developing software or systems that connect with the systems used by all parties is the answer to ensure effective information exchange throughout the chain and decide if the stored goods are adequate or whether more goods are required. Additionally, this system will be linked to the shop, which will predict the demand for the products from consumers and those in need. Because of this system, the ministry will be able to accurately assess the requirements of its constituents and promptly provide the goods they need, all while maintaining the highest possible level of service quality and timely delivery.
- Mainly between the retail sector, logistics centers and the supply and internal trade ministry will run this system. There will be more access to the system for the Ministry of Supply and Internal Trade. The ministry will have access to all merchants in the area as well as the sales of shops in every district throughout

the nation. The system will offer up-to-date information on the sales of subsidized goods and other ministry-supplied goods. The logistics center will be provided with data on purchases in order to control purchases, storage capacity, and buying lead time. Additionally, it gives retailers the option to automatically determine their required quantities based on sales data and various forecasting techniques developed by the system, all while taking the capacity of the retailer's warehouse into account, and then sending the order to the logistics center for preparation.

- The logistics center will begin the necessary procedures to prepare the items for shipment, and the ministry will be aware of which products have been produced and which warehouse they came from, as well as which retailer they will be delivered to in which region.
- The latter provides many benefits to the ministry, including the ability to precisely estimate the amounts needed by the market, particularly each district's demand for certain goods, and therefore control product purchases. In addition, it aids the ministry in anticipating demand and allocating appropriate funds in advance so that they are well-prepared to meet it.
- The retailers may also give the warehouses and the ministry along with high seasonality when they require the goods to come and in how much quantity according to the need of the merchants Additionally, this technology will allow the logistics center to control their warehouse and establish solid logic in response to the flow of goods in and out of the facility.
- Last but not least, the logistics centers and the ministry of supply and internal trade may get feedback from merchants on the progress and act accordingly. This feature may also assist the ministry in determining whether the number of retailers in specific districts is appropriate or not, and it allows them to assess the progress of the logistics center, as well as the quality of their operations and their storage capacity, without the use of customary communication tools that do not provide the ministry and logistics centers with accurate information.

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# APPENDIX (A)

## Analysis of triple Likert results (Questionnaire)

| No | Titles (Questionnaire) | Sufficient/ Yes | Average/ No | not enough/Maybe |
|---|---|---|---|---|
| 1 | what is your evaluation concerning the investment in the food sector? | | | |
| 2 | does the recent ministry projects improve food security for citizens? | | | |
| 3 | did the warehousing and silos latten projects reduce waste and preserve goods safety? | | | |
| 4 | did the warehouses help in cost reduction? | | | |
| 5 | does the newly established logistics centres enhance food products delivered to the citizens? | | | |
| 6 | does the packaging material ensure goods' safety and quality? | | | |
| 7 | does the latten ministry's project helps to achieve sustainable development goals for 2030? in addition, it economic, social, and environmental dimensions? | | | |
| 8 | does the supply chain help the ministry to meet the demand of the food commodities in the high demand seasonality? | | | |

# تأثير الإدارة اللوجيستية وأهداف التنمية المستدامة (SDGs) على تحسين الإمدادات الغذائية في مصر

د. داليا محمد يونس

## ملخص البحث باللغة العربية

البحث يناقش أهداف التنمية المستدامة (SDGs)، وتحديداً الهدف الثاني (القضاء على الجوع)، ومااسباب الجوع حول العالم، وخاصة في مصر ، من أجل إيجاد حلول مناسبة لحل مشكلة الاتصال الرئيسية التي تواجهها الوزارة والتي لها تأثير على جودة الخدمة التي تقدمها الوزارة للمواطنين المصريين. تم اكتشاف في الدراسة كيف لعبت المراكز اللوجستية التي تم إنشاؤها حديثًا دورًا مهمًا في تعزيز الإمدادات الغذائية وتقليل عدد المنتجات المعيبة في السوق. علاوة على ذلك، ينظم عملية تخزين المنتجات من أجل الحفاظ على البضائع وتقديم سلع ذات كفاءة عالية للشعب المصري من خلال خفض معدل الخلل في الأصناف وتحسين جميع العمليات اللوجستية من أجل إعطاء سلع عالية الكفاءة للمواطنين المصريين. أخيرًا، يقدم برنامجًا من أجل تعزيز الاتصال بين السوق ووزارة التموين والتجارة الداخلية والتوزيع والتسهيلات اللوجستية. وخلاصة القول، لا شك في أن التأهب يجعل الحكومات قوية بما يكفي للتعامل مع أي صدمات أو تغييرات مفاجئة في الطلب التي قد تحدث. كانت الحكومة المصرية مستعدة جيدًا قبل صدمة جائحة COVID-19 ، الذي يعتبر العامل الذي يمكّن الحكومة المصرية من توفير جميع السلع الأساسية مثل السكر والأرز وزيت الطهي دون أي نقص حتى عندما تم تقييد التجارة. لعبت المراكز اللوجستية دورًا حيويًا في هذه العملية لأنها تعتبر العمود الفقري لإمدادات الأغذية في جميع أنحاء مصر أثناء الوباء باستخدام تقنيات لوجستية مختلفة حتى بعد الوباء. حيث أنه يخزن البضائع التي تكفي لأشهر. بالإضافة إلى ذلك، وفقًا للاستبيان، يثبت الأشخاص أن المراكز اللوجستية تعمل بشكل جيد. أخيرًا، تبلي مصر بلاءً حسنًا في عملية الإمداد بالغذاء ولكن هناك حاجة إلى مزيد من الاستثمارات لتحسين جودة الخدمة وخفض التكاليف.

**الكلمات الدالة:** أهداف التنمية المستدامة، إدارة الخدمات اللوجستية، توريد الغذاء في مصر.

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