



مركز الاستشارات والبحوث والتطوير
بأكاديمية السادات للعلوم الإدارية

مجلة البحوث الإدارية

Journal of Management Research

علمية - متخصصة - مُدكّمة - دورية ربع سنوية

للسنة
الثانية والأربعين

Vol. 42, No.4; Oct. 2024

عدد أكتوبر 2024



jso.journals.ekb.eg

رئيس مجلس الإدارة
أ. د. محمد صالح هاشم
رئيس أكاديمية السادات للعلوم الإدارية

رئيس التحرير
أ. د. أنور محمود النقيب
مدير مركز الاستشارات والبحوث والتطوير

ISSN : 1110-225X



Arab Academy for Science, Technology & Maritime Transport

**The Impact of Applying Logistics Activities on Achieving Sustainable Development in
Agricultural Crops in Egypt
Applied to the Sugar Cane Product in Southern Upper Egypt**

A thesis submitted in partial fulfillment of the requirements for the Master's Degree in
Transport Logistics Management

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ABSTRACT

The sugar cane cultivation sector is very important to the Egyptian economy and also with many production chains for products derived from it, with the difference of each production chain derived from it and related to food and energy products that are extracted from sugar cane.

This study aimed to identify the extent of the impact of logistical activities that include harvesting, transportation, loading and unloading, storage, and the introduction of technological machines and equipment in this agriculture and their impact on sustainable development in Upper Egypt.

Using the descriptive analysis method through the questionnaire in order to collect data from the target population in the study.

The results showed the impact of logistical activities on that agriculture by reducing costs borne by sugar cane farmers, reducing travel time in the transportation process, reducing losses from this crop, reducing environmental impact and raising the level of sustainable development.

The study recommended the importance of introducing machinery and equipment in the harvesting process and shipping machines in sugar cane farms instead of muscular effort that benefits all parties to the supply chain, whether sugar cane farmers or sugar cane factories, and greatly helps to achieve sustainable development.

Keywords: *Logistics activities, sugar cane, sustainable development, Supply chain management.*

1. Introduction

A tall perennial herb belonging to the genus *Saccharin*, sugar cane is used to make sugar. The plants are typically 2–6 m tall and have thick, articulated stems that are rich in sucrose and build up in the inner stems. Originally from the warm, temperate tropics of Southeast Asia and New Guinea, sugar cane is now primarily grown in tropics and subtropics. Sugar cane is one of the most economically significant crops that helps produce food for half the world's population. (Som-ard, J. et al, 2021).

A variety of culinary products, including sugar, molasses, and golden syrup, are made from sugar cane. The biofuel ethanol can also be made from sugar cane, which is used in the paper and wood industries as well as for transportation in its pure form but is typically blended with gasoline to reduce car emissions. Cuttings are the main method of sugar cane reproduction. Seed canes are sections of young cane stems that are used for planting. (Elsharif, A. A., & Abu-Naser, S. S. 2019).

Sugar cane needs black, heavy and rich muddy soil, which is usually found in Upper Egypt. Sugar mills based on sugar cane were established in different parts of Upper Egypt near the sugar cane fields. After learning about sugar cane, what we want to talk about in this research will come. The impact of logistical activities on sustainable development on agriculture and its application to the sugar cane product, by looking at the processes of harvesting, transportation, storage, packing, unloading, shipping, and others on the sugar cane product in southern Upper Egypt, in order to identify the extent of application and solve those problems and obstacles facing sugar cane, whether with farmers, transport contractors, or sugar mills in southern Upper Egypt. Carry out services and logistics activities on that product.

As the production costs of sugar cane production are high, which makes many farmers turn to crops that are more profitable than sugar cane, such as growing tomatoes, corn, etc., so it is necessary to think about how to find machines for growing and harvesting sugar cane that reduce the high cost. From manual labor, and

what happens from setting fire to the crop, due to the lack of labor, which is a very big obstacle to sustainable development. (Fernandez-Vazquez, S. et al,2022)

2. Literature Review

(Almeida, P.et al,2022)

(ADVANCES IN MODELLING OF THE INTEGRATED PRODUCTION LOGISTICS IN SUGAR CANE HARVEST)

Aim: Finding and presenting a model of integration for the logistics and operations of the sugar cane harvest, with an emphasis on increasing the industrial plant's production capacity. Indicators to measure the level of production logistics operations' efficiency are suggested in this research.

Findings: According to preliminary findings, production logistics times can be greatly cut during the harvest stage. Production logistics techniques optimize travel times and speeds during the harvesting stage when seen as a coordination-oriented flow with sequential activities. A dataset for the sugar cane industry's operations, logistics, and production is used in the model that was created.

(Misra,V . et al, 2022)

(Post-harvest biology and recent advances of storage technologies in sugar cane)

Aim: to ascertain what causes the sugar cane crop to degrade quickly, similarly to other perishable crops. Sugar recovery is significantly impacted by the sugar cane's quick loss of sucrose concentration after harvest.

This post-harvest problem exists. Loss of sucrose is a major concern in nations that grow sugar cane since it not only results in subpar factory sugar recovery but also subpar sugar refining. Unreasonable hold-ups in the transportation of sugar cane from the fields to the mill are typically linked to a variety of issues with primary or secondary sucrose losses, all of which significantly reduce the weight of the cane and sugar recovery.

Findings: *Leuconostoc* varieties plays. essential part in lowering sugar recovery It spreads through cut ends (during harvest time), grows during delays in transportation, and flourishes in sugar mills where sugar cane is piled up before being ground into sugar. The bacteria have plenty of opportunity to multiply during transport from fields to mills as well as from cane fields to mill centers, although with the rise in crushing capacity, storage in heaps in sugar mills to some extent. Both farmers and cutting and crushing operations need to operate more quickly.

(Nguyen, T. et al, 2022)

(Research and Development Prospects for Sugar cane Industry in Vietnam)

Aim: Because sugar cane is one of the most significant crop sectors in Vietnam, it is crucial to understand the issues that the industry is currently facing.

Numerous policies and programmers have been implemented to address the issues that this significant business is currently experiencing. The results of crop breeding and zoning programmers have a significant impact on sugar cane productivity and sugar yield. Currently, Vietnam has 25 sugar mills with a total daily cane production capacity of 110,000 tones'.

Findings: Despite the fact that the government has recognized the significance of this commodity and implemented numerous measures that have benefited, Vietnam's sugar cane industry has encountered numerous challenges over the past few years. Crop division regulations, varietal improvement initiatives, and efforts to standardize crop prices are a few of them. Vietnam's sugar business has been subjected to fierce competition from its neighbors.

In order to compete with other crops and imports from abroad, R&D in Vietnam is currently concentrated on breeding programmers, bettering farming techniques, and developing value-added sugar and mill co-products.

(Mohamed, W. M., & Ahmed, T. A. 2022)

(The impact of developing logistic performance on the development of Egyptian total and agricultural exports)

Aim: employing the gravity model, to ascertain the degree to which the evolution of logistical performance on the development of total agricultural exports is reflected in the COMESA agreement.

Findings: The most significant elements influencing all Egyptian exports to COMESA nations. In addition to the negative consequences of distance, it is reflected in the per capita GDP of the importing nations, the commercial openness to Egypt, the involvement in the land borders, and the gross domestic product of the importing country. With an increase in Egypt's GDP, the logistics sector's performance index grows.

(Munoz, F. 2022)

(COLLABORATIVE LOGISTICS IN PERISHABLE AGRI-FOOD SUPPLY SYSTEMS)

Aim: For farmers who find it challenging to coordinate their farming activities with upstream supply chain operations and where processing or distribution cannot be separated from harvesting operations by building stock on the farm after harvest, this study is based in part on perishable crop-independent AFSS systems. Vegetables for the fresh market and sugar cane are two significant industries that are used as case studies. In this study, the difficulties of plantation grouping and harvest sequence and truck release control, two major issues in the sugar cane business, are discussed. When farms are combined for harvest, the first issue was created as a two-objective nonlinear programmer with the goals of maximizing sugar production and decreasing the maximum block diameter.

Findings: According to the study's findings, delivery times, long-distance transportation expenses, and overall mileage have all significantly decreased.

(Otieno, S. M. S. D. S., & Elijah, M. 2022)

(An Analysis of Transportation Costs and Performance of Public
Sugar Manufacturing Firms in Kenya)

Aim: This study sought to determine how operations management affected the performance of general sugar manufacturing companies in Kenya using three theories: resource-based theory, systems theory, and dynamics capacity theory. Finding out how transportation costs impact Kenyan enterprises' performance in general sugar processing was the specific goal.

Six Kenyan sugar processing facilities that were open to the public and had been running for ten years served as the study's unit of analysis.

Findings: The majority of public sugar producers have reported improved performance as a result of transportation costs.

While the subcontracting companies are forced to deal with losses brought on by excessive prices and the monopoly of some transportation actors, Kenyan sugar manufacturing companies subcontract transportation services for both internal and external transportation.

The use of less expensive transportation methods like rail transportation and the use of navigable waterways is required of sugar manufacturers as a whole.

To establish an integrated Ferro vial network connecting all subsidiary companies, each with collection centers that are connected to the national Ferro vial network, the Kenyan railways will be contracted.

(Fernandez-Vazquez, S. et al,2022)

(Block chain in sustainable supply chain management: an application of the analytical hierarchical process (AHP) methodology)

Aim: Discover the advantages of block chain in supply chain management with the aid of a literature evaluation and the insights of industry experts from various fields.

Approach, methodology, and design The AHP technique has been applied with the goal of increasing the use of block chain technology in supply chain management, particularly when comparing within the same industry. In this study, a total of eight factors—decentralization, resilience, security, smart contracts, sustainability, traceability, transparency, and trust—were looked at in order to construct the AHP model.

Findings: Individual benefit factors have substantially higher overall weights in block chain-enabled supply chains than they do in conventional ones. The block chain-enabled supply chain greatly outperforms the old supply chain in terms of enhancing the sustainable development of the supply networks of today, when the degree of attractiveness is compared between the traditional supply chain and the block chain-enabled supply chain.

(Sengupta, A. 2022)

(Sustainable Development in India with reference to Agricultural Sector)

Aim: to discuss and investigate the subject of Indian agriculture's sustainable growth. Additional goals include comparing the environmental, economic, and social aspects of sustainability of the permaculture system to those of the conventional system and the current system as it is being used. In order to promote and implement sustainable methods, it also seeks to offer long-term answers to the issues it faces.

Findings: Sustainable agriculture requires a shift in agricultural technology away from production focused on profit. The environment is improving steadily for the growth of sustainable agriculture. eyes are opened to new possibilities Overall sustainability will be greatly increased by farmers, development experts, researchers, and policy makers managing small farms to increase productivity, profitability, and the sustainability of the farming system.

(Ungureanu, N., et al 2022)

(Sustainable Valorization of Waste and By-Products from Sugar cane Processing)

Aim: This study examined how processing trash and byproducts from sugar cane could support the bio economy and environmental sustainability. Sugar cane-growing regions expand yearly to keep up with the rising demand for sugar for food and biofuels. Large volumes of byproducts and garbage are produced throughout the entire sugar cane harvesting and processing process. It decomposes quickly if badly maintained, contaminating the environment and harming human health.

Technologies have been created to use waste biomass in order to address concerns about reducing greenhouse gas emissions and dependence on fossil fuels. Biochemical and thermochemical processes can be used to produce bioenergy, which is renewable.

Findings: The majority of the solid waste produced by sugar mills is bagasse. In addition to energy recovery, there are technological possibilities for using bagasse as a raw material or additive to produce a variety of goods, such as building materials, paper, biopolymers, nanomaterials, bio sorbents, household products that degrade, construction media, and substrate fermentation. Effluent, which includes wastewater from the sugar cane processing stages and wine from the distillation of ethanol, can be used to produce bioenergy as well as organic fertilizer for agricultural lands with advantages for both agriculture and the environment, provided the wastewater is properly treated to remove dangerous pollutants.

(Mehmann, J., Teuteberg, F. 2016)

(The fourth-party logistics service provider approach to support sustainable development goals in transportation – a case study of the German agricultural bulk logistics sector)

Aim: Clarify the various roles of the involved parties, give a general overview of the integration of a third-party logistics service provider into the transportation (planning) process, and describe the updated transportation planning process as a process. We use a mixed method approach to deliver both qualitative and quantitative insights based on simulations and semi-structured interviews. A case study is used to determine the approach's results and advantages. Involving a 4th party logistics provider and the accompanying transportation planning process in stated logistics region can lead to cost reductions of up to 38%, help lessen environmental damage and lessen existential social hurdles.

Findings: A major factor in raising the 4PL approach's profile in the bulk agricultural logistics industry is the scientific endeavor to establish a 4PL transportation planning procedure for truckload shipments. Applied conclusions demonstrate the best resource utilization across various planning horizons, making a significant contribution to a more sustainable transportation industry. The 4PL technique is also applied for the first time in this study from the standpoint of sustainable supply chain management, and it is validated using a hybrid methodology that encapsulates application-oriented research.

The outcomes highlight the 4PL approach's applicability and designate it as a long-term objective. As a result, the performers' financial gains can be increased. assuming strengthened bonds and more.

3. Research problem

Sugar cane industry faces many problems in logistics activities, specifically from farms to factories, which is reflected in the sustainable development of this sector.

4. research questions

The study questions are represented in the main question, which is the extent of the impact of the application of logistical activities on sustainable development in agriculture on the sugar cane product in southern Upper Egypt?

1. What are the nature of the problems facing the process of harvesting sugar cane in southern Upper Egypt?
2. What are the obstacles facing the transportation of sugar cane in southern Upper Egypt?
3. What are the reasons that make shipping bales better than muscular effort in South Upper Egypt?
4. What is the benefit of reducing the waiting time and retention in the sugar cane factories in southern Upper Egypt?

5. Research Objectives

The main objective of this research is the effect of applying logistics activities on sustainable development in agriculture on the sugar cane producer in Upper Egypt.

A number of sub-objectives are derived from this objective:

1. To identify the problems of harvesting sugar cane in the fields.
2. To introduce of modern machinery and equipment in the process of shipping sugar cane in the fields.
3. To determine the gains resulting from the express shipment of sugar cane product in the sugar cane fields.
4. To determine the damages resulting from the storage period of sugar cane.
5. To identify the nature of the problems facing the process of transporting sugar cane from the fields to the sugar cane factories.

6.To determine the gains resulting from the application of rapid unloading of sugar cane product in sugar cane factories.

6. Research Importance

The importance of research (the scientific aspect)

The importance of the current study is due to the importance of the subject that we address in that study, which is to present an advanced idea, through the application of logistical activities to sustainable development in agriculture in Egypt by applying it to sugar cane, which provides scientific benefit to that important agriculture in Upper Egypt.

The importance of research (the applied side)

A. To the knowledge of the researcher, this study is considered the first study that dealt with the issue of the impact of logistical activities on sustainable development and its application to the sugar cane product in Upper Egypt, but there are studies that talked about this topic outside Egypt.

B. This study can be placed under the attention of officials to be taken as a solution to the problems of the sugar cane harvesting process in the fields.

C. Finding possible solutions to overcome the problems facing the transportation process from fields to sugar factories.

D. Saving time and effort in the process of shipping sugar cane to the fields.

E. Savings in the cost incurred by sugar cane farmers when using modern technological equipment in shipping operations.

F. Organizing the unloading process in the sugar cane factories gives many gains and benefits to the factories.

G. This research is considered a fertile field to consider the cost to sugar cane farmers in Upper Egypt and reach the largest possible cost reduction.

7. Research hypotheses

H.1 There is a statistically significant relationship between logistics activities and sustainable development.

H.1.1 There is a statistically significant relationship between harvesting (cutting) and sustainable development.

H.1.2 There is a statistically significant relationship between transportation and sustainable development.

H.1.3 There is a statistically significant relationship between shipping and sustainable development.

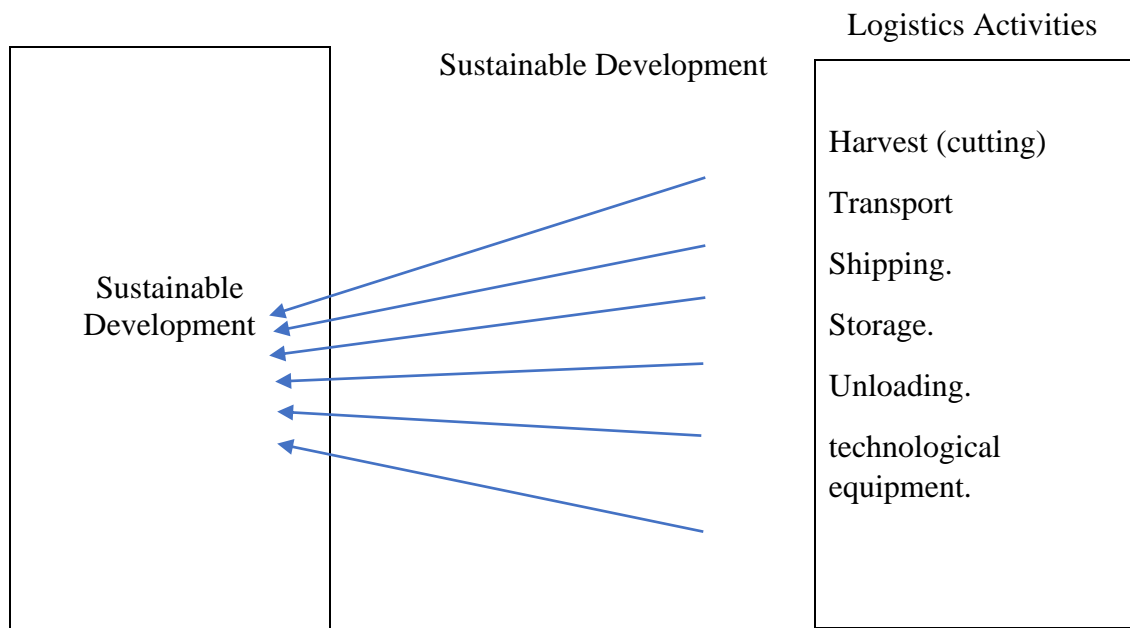
H.1.4 There is a statistically significant relationship between storage and sustainable development.

H.1.5 There is a statistically significant relationship between unloading and sustainable development.

H.1.6 There is a statistically significant relationship between the use of technological equipment and sustainable development.

8. Research Variables

Through the researcher's review of each of the previous studies and the results of the interviews with sugar cane farmers and officials in the sugar factories, the researcher arrived at the study model shown in Figure ((1-1), and it is clear from it that the independent variable (logistical activities) and its six dimensions: (Harvesting, transportation, shipping, unloading, storage, and technological equipment) affects the dependent variable (sustainable development) and the demographic characteristics of sugar cane farmers through (experience level, center).



Figure

Conceptual framework

Source –by The Researcher

9. Methodology

The methodology used in this study is the descriptive Analysis method, because it is the appropriate method for this study, through the questionnaire to reach a proposal for solutions to the problems facing the cultivation of sugar cane and the personal interviews that were worked on to reach the research problem in the exploratory study and clarify it with the various parties related to that cultivation , sugar cane producers, subcontractors, agricultural engineers, and officials in the transportation sector in sugar cane factories in Edfu, Kom Ombo, and Armant. The study sample will be from those places that have been mentioned, and also to identify those problems that naturally affected products derived from sugar cane, which A problem that exists at the present time, and because that requires study and research.

Data

Primary Data

The researcher will extract a gap from interviews with sugar cane farmers and producers and officials of the transportation sector in sugar cane factories to identify and explore the problem. The researcher reinforces the research problem with quantitative data by designing a questionnaire to be distributed to sugar cane farmers and producers and officials of the transport sector in sugar cane factories to measure the problem and he can determine the extent of the impact of logistical activities on the advancement of the sugar cane cultivation sector. In conclusion, the researcher conducts a quantitative method by distributing the survey to two categories (1) sugar cane farmers and (2) officials of the transportation sector in sugar cane factories to test the hypothesis. The researcher uses two categories in the distribution of the survey to be able to draw a conclusion from different points of view within the logistical activities and their effectiveness.

Secondary Data

The secondary data in the research will be the literature dealt with in previous studies that supports the aims of the research and reveals the relationships between the variables from a positive point of view.

population

The study population consisted of sugar cane farmers and officials of the transport sector in the sugar cane maker, Aswan and Luxor governorates, which numbered approximately sugar cane farmers and officials in the transport sector in sugar cane factories, spread in the two governorates and their affiliated centers.

Sample

According to the population, we will select the sample based on the Yamane technique to select a sample that can represent the population with accurate inference data.

10. Research Limitations

The research will be applied on sugar cane farmers and factories in Aswan and Luxor governorates, and the time horizon will be from September 2022 to September 2023, The study focuses on only 6 logistical activities (Harvest (cutting), Transport, Shipping, Storage, Unloading, technological equipment) without the rest of the other logistical activities.

11. Research Plan

- Chapter 1: Introduction
- Chapter 2: Logistics Activities
- Chapter 3: Sustainable Development
- Chapter 4: Statistical Analysis “SPSS”
- Chapter 5: Conclusion & Recommendation

12. Theoretical framework

The emergence and development of logistics

A manufacturer uses a supply chain, which is a network of suppliers, distributors, and subcontractors, to obtain its raw materials, components, and supplies. Companies that handle logistics store, transport, and distribute goods and services that are currently being used in the supply chain as well as deliver finished goods to clients or middlemen. Integration of the supply chain and logistics procedures increase productivity while lowering costs. (Christodoulou Chasapis, M. 2022).

Logistics involved the purchase, upkeep, and transportation of military supplies and people. Despite the fact that some authors had begun discussing the idea of

substituting one expense for another earlier, such as shipping costs with inventory costs, and discussing the company's advantages in getting the right goods to the right place at the right time, the traditional company was structured around the activities currently connected with logistics. (Degirmenci, C. 2022).

Planning, carrying out, and controlling all logistical procedures are all included in logistics management. The movement of commodity flows from the source of raw materials through the delivery of the product to the end consumer is made possible by a collection of all the operations. For the realization of commodities flows and logistics management, information flows are required. (Radivojević, G., & Milosavljević, L. 2019).

Inbound and outbound transportation management, warehousing, materials processing, order completion, logistics network architecture, inventory management, and supply/demand maintenance are a few examples of instruments used in logistics management. In each stage of the system/product life-cycle, logistics, which comprises the integration of several activities and aspects, has grown in importance. (Degirmenci, C. 2022).

logistics services Provider (LSP)

LSP are companies involved in trade facilitation at the national and international levels, and they make the biggest contribution to company success. For competitive advantages, their direct participation on behalf of corporate entities in import and export in international trade is crucial. LSPs help with the organization of logistics for the shipment and/or delivery of goods. Due to the difficulty of managing all operations on one's own, LSPs outsource as a result of the complexity of the supply chain and the growing business processes. As a result, logistics middlemen are capable of handling specific business processes. (Majid, Z. A., 2019).

Technological equipment used in sugar cane operations

Analysis of Farming Using Agricultural Equipment Utilizing available resources to boost yields on current farms in order to maximize revenues is known as sugar cane farming. Agriculture analysis is useful for assessing the level of effective and efficient resource usage, which can result in outputs that are greater than inputs. Therefore, using machines to benefit sugar cane agriculture is also using technological resources. (Fatah, G. S. A. et al. 2022)

A major new trend in agricultural science known as "precision agriculture" emerged at the end of the 20th century as a result of the growth of information technology and potential for robotized agricultural machinery (PA). Precision crop production incorporates cutting-edge techniques from not just the traditional agronomical science provinces but also from other fields of study. Precision agriculture, which takes into account the spatiotemporal variability of plant growth and development circumstances in an agricultural field, is a novel and comprehensive way to solving issues arising from the "green revolution." The proper use of PA fundamentally alters the decision-making process, greatly increasing the effectiveness of control over agro technical activities, reducing environmental pollution, raising the incomes of agricultural producers, and enhancing the quality of the produced goods. (Yakushev, V. P., & Yakushev, V. V. 2018).

Throughout the agricultural system, evaluation encompasses the integration of all appropriate practices, from planting to harvesting, packaging, and transportation. (Khan, N., et al.2021)

The role of sustainable development in agriculture

CSA also means boosting resilience, sustainability, and production, which will help farmers adapt to climate change and reduce GHG emissions. (Mutamba, M. and Mugoya, M. 2014).

CSA is a successful strategy to increase agricultural productivity and feed the world's population in the face of climate change. It was developed as a framework to encapsulate the idea that agricultural systems can be created and put into use concurrently to enhance food security and rural livelihoods, make it easier to adjust to climate change, and offer other advantages. The idea of CSA is still being developed, and little study has been done to examine how it relates to sustainable agriculture and how CSA practices might be encouraged to meet development and food security objectives. Despite the possibility of achieving the sustainable agricultural development aim by correctly implementing CSA, there is a lack of coordination among the CSA's field-level components. More importantly, different layers of stakeholders occasionally have trouble understanding the notion. A more integrated response to climate change and wider adoption of CSA practices will be possible in the pursuit of the goals of food security and sustainable development. This will be made possible by a better understanding of the concept of CSA, its connections with sustainable agriculture, and the pathways to promote CSA. Therefore, in order to achieve a sustainable and better future, it is essential to promote and spread CSA practices at the field level. In order to promote sustainable agriculture and achieve global food and nutritional security, this article investigates the viability of adopting CSA techniques. It also looks at the relationships between the CSA's elements and how they all work together to further the goal of sustainable agricultural growth. (Sarker, M. N. I.et al,2019)

Sustainable development in the activities and cultivation of sugar cane.

Modern agricultural operations management, which supplements conventional agricultural operations planning techniques, includes analysis of the planned operation, operations optimization focusing on the route optimization and capacity dimensioning, as well as operation planning (including resource allocation, scheduling, analysis of the time required to carry out the operation, and mission planning). (Bochtis, D.et al.2018)

The replacement of human sensory and mental inputs by automation systems using communication and information technologies is conceivable given the present development of such systems. There are a lot of new advantages that come with using these automation systems, such as better repeatability linked to improved work performance and increased capacity. Additionally, labor expenses and the use of material inputs (such as fertilisers and agrochemicals) decline. The quicker adoption of new manufacturing techniques also boosts the production system's adaptability. Automation systems also offer improved process control, which raises product quality. (Bochtis, D.et al.2014)

13. Conclusion and Recommendations

Conclusion

Through this study, the researcher reached a number of conclusions with statistical coefficients in the agricultural sector under study, as follows:

- By measuring the reliability coefficient alpha Cronbach, it was found that all stability coefficients are greater than 70%, which indicates high stability and understanding of the content of the survey, and therefore the realism of the responses.
- By measuring the internal consistency coefficient, it was found that the correlation coefficients are mostly between 0.60 and 0.80, and this is evidence that the phrases that were then presented in the survey list are good and understandable to the respondents.
- According Sample Properties It was emphasized that the majority working in the field of agricultural crops have a high level of practical experience to give direction to the researcher on the credibility of the measured results.
- As for the centers under study, it was found that the percentages are close to each other in terms of sample size. The Kom Ombo Center obtained approximately 28%, the Edfu Center obtained approximately 42%, then the Armant Center, which obtained approximately 31%.

A) Through descriptive statistics:

Two measures were reached for the variables of the study, related to:

The first variable is (logistical activities), which included (30 phrases) in the agricultural sector under study. It has a degree of approval and high approval among its contents, and it can be relied upon in subsequent studies.

The level of logistical activities was high with an arithmetic mean of (4.04), in all its dimensions.

B) The main research hypothesis states the following:

There is a statistically significant effect between the dimensions of logistical activities (harvesting, transportation, shipping, storage, unloading, technological equipment) and sustainable development.

The Conclusion for the main hypothesis:

- There is a positive, direct, statistically significant effect at a significant level of less than (0.05) between the total logistical activities dimension of agricultural crops on the sugar cane product and sustainable development, where the value of the correlation coefficient was (0.772), which highlights the role of logistical activities and their impact on sustainable development and cost reduction. Related to the operations of harvesting the sugar cane product, transportation, shipping and unloading of the sugar cane and the emergence of the effect by using modern technological equipment, which has a major role in reducing the time in all operations starting from harvesting the sugar cane in the farm until the arrival of the sugar cane factories.

- There is a positive, direct, statistically significant effect at a significant level less than (0.01) between the total after harvest (cutting) of agricultural crops on the sugar cane product and sustainable development, where the correlation coefficient value was (0.604), which highlights the role of logistical activities and their impact on

sustainable development. Which serves the needs of sugar cane farmers and reduces the cost of manual harvesting to complete the harvesting process, which is very high when using manual harvesting without considering the modern equipment that has been reached for the harvesting process.

- There is a positive, direct, statistically significant effect at a significant level of less than (0.01) between the total transport dimension of agricultural crops on the sugar cane product and sustainable development, where the value of the correlation coefficient was (0.586), which highlights the role of logistical activities and their impact on sustainable development, as the process of Transporting sugar cane with animals (camels, etc.) is very difficult in relation to the efforts exerted by sugar cane farmers. In addition, the losses due to the use of this loss of sugar cane crops are large and affect the profitability of sugar cane farmers.

- There is a positive, direct, statistically significant effect at a significant level of less than (0.01) between the total shipping dimension of agricultural crops on the sugar cane product and sustainable development, where the value of the correlation coefficient was (0.354), which highlights the role of logistical activities and their impact on sustainable development, as shipping The sugar cane product on the various means of transportation, using the labor force, is very high, which increases the burden on the sugar cane farmers and affects their income level.

- There is a positive, direct, statistically significant effect at a significant level less than (0.01) between the total storage dimension of agricultural crops on the sugar cane product and sustainable development, where the value of the correlation coefficient was (0.211), which highlights the role of logistical activities and their impact on sustainable development, because reducing costs The storage of the sugar cane product is in the interest of the sugar cane farmers, as this increases the profits that the farmers will get in the end.

- There is a positive, direct, statistically significant effect at a significant level less than (0.01) between the total dimension of unloading agricultural crops on the sugar

cane product and sustainable development, where the value of the correlation coefficient was (0.242), which highlights the role of logistical activities and their impact on sustainable development, because the increase in time The process of unloading the sugar cane crop, whether it is on the farm before the transportation process or in the sugar factories during the unloading process, all of this makes the total time for the transportation process very large.

- There is a positive, direct, statistically significant effect at a significant level less than (0.01) between the total dimension of unloading agricultural crops on the sugar cane product and sustainable development, where the value of the correlation coefficient was (0.643), which highlights the role of logistical activities and their impact on sustainable development, as the use of Technological equipment, i.e. the use of automatic shipping machines for sugar cane, saves a lot of time and also the effort expended by sugar cane farmers.

- From the foregoing, it can be said that the effectiveness of Technological equipment is one of the most important elements affecting sustainable development, followed by Harvest (cutting), because of its benefits with regard to the use of technological equipment because it greatly limits the actions of sugar cane farmers and reduces air emissions resulting from setting fire to the crop Due to the lack of manpower, which has significant environmental damage, and thus reducing environmental accidents in sugar farms resulting from setting fire to crop residues after harvesting, however, the disappearance of a major role that sugar factories must bear, whether by focusing on environmental sustainability or the existence of an environmental system that allows for proper disposal From the waste resulting from the process of harvesting sugar cane, and ignoring the sugar factories also in turn in terms of educating sugar cane farmers about the benefits of green supply, all of this when paying attention to it will return to the sugar cane farmers an increase in profitability and a decrease in the time and effort spent.

- It can be said that the least effective activity is Storage, which affects sustainable development, followed by Unloading, as it is because of these two dimensions that the percentage of effectiveness varies on sustainable development, but activating the storage dimension will result in reducing the percentage of losses, and thus maintaining the percentage of sucrose in the sugar cane product, and this will benefit me Sugar cane farmers in preserving the weight of the sugar cane product without exposure to any losses. As for unloading, it has a great role, which takes time and effort, whether by sugar cane farmers or sugar cane factories during the unloading of the sugar cane crop in the factory.

Recommendations

Table
Recommendations

| Recommendation | How to implement | The agency entrusted with implementation | The time period for implementation |
|---|---|--|---|
| It is necessary to update the transport process plan for the sugar cane factories, so that the sugar cane factories can achieve the goals they seek, so that this results in an increase in the production of sugar cane. | Nominating a group of specialized professors from universities and transport and logistics experts. | - Senior management in sugar cane factories. -Agricultural associations. -Transportation subcontractors. | year |

| | | | |
|--|---|---|------------------|
| <p>Focusing attention on logistical activities by both sugar cane farmers and sugar cane factories, and on the concerned authorities to clarify and advise sugar cane farmers about the extent and importance of logistical activities that work efficiently and that bring them increased profitability, whether for farmers or sugar cane factories.</p> | <p>Obligate all participating parties to pay attention to logistical activities and clarify the return behind the implementation of logistical activities in terms of increasing profits and reducing costs and time.</p> | <p>-Ministry of Agriculture. - Ministry of Supply and Internal Trade. -Sugar cane factories. -Agricultural associations. -Sugar cane farmers. -Transportation subcontractors.</p> | <p>Two years</p> |
| <p>Taking care of the agricultural railways and making their services regular and with fixed schedules in an appropriate manner to ensure that the sugar cane crop is not lost and reduce the time and thus save large sums of money by benefiting from the economies of scale provided by the agricultural railways</p> | <p>Developing and updating the procedures implemented in agricultural railway schedules, through specific and visible standards.</p> | <p>-Sugar cane factories.</p> | <p>year</p> |

| Recommendation | How to implement | The agency entrusted with implementation | The time period for implementation |
|---|--|--|------------------------------------|
| <p>Seeking to reduce the time of shipping sugar cane on various means of transportation, whether (agricultural tractors, agricultural railways), which is done by manpower, which takes a long time without considering the equipment that has been reached that makes the time spent in the shipping process very short, which is of great value. A very high safety rate and overcoming the problem of lack of manpower</p> | <p>Oblige the participating entities to implement the application through a unified system.</p> | <p>-Sugar cane factories. -Sugar cane farmers. -Transportation subcontractors.</p> | <p>year</p> |
| <p>Reducing the storage time of the sugar cane crop after harvesting affects the percentage of sucrose present in the sugar cane product, which has a major role in the yield of the price of a ton of sugar cane, which increases whenever the time period for storing the sugar cane product is appropriately short.</p> | <p>Commitment of all participating parties after the harvest process, continuous and permanent monitoring and follow-up.</p> | <p>-Sugar cane factories. -Sugar cane farmers.</p> | <p>year</p> |
| <p>Work to reduce the time of unloading, which is by using manpower for sugar cane instead of taking a long time and effort without the use of modern equipment that greatly reduces that.</p> | <p>Commitment of all parties involved in the unloading process, whether sub-contractors or sugar cane growers.</p> | <p>-Sugar cane farmers. -Transportation subcontractors.</p> | <p>year</p> |

| Recommendation | How to implement | The agency entrusted with implementation | The time period for implementation |
|--|--|---|------------------------------------|
| Sugar factories should pay great attention to inventing new ways of cultivating sugar cane and not stop repeating the same old methods without looking at the innovative and developed methods that have been reached now. | Obliging all participating parties to follow up continuously, by passing through sugar cane factories. | Ministry of Supply and Internal Trade. -Regulators | Two years |
| Encouraging, supporting and raising the efficiency of farmers to cultivate the sugar cane crop with its agricultural importance aimed at serving the industrial sector and clarifying the benefits on the economic return, taking into account that in the return that will be obtained by the sugar cane farmers. | Prepare a study to study the needs of sugar cane farmers. | -Ministry of Supply and Internal Trade. -Sugar cane factories. | year |
| Avoid recurrence rates of environmental accidents in sugar cane farms resulting from setting fire to crop residues after harvest, which greatly affects the environment and the pursuit of sustainable development. | Permanent control of sugar cane farmers and awareness campaigns to clarify the damages resulting from this wrong action. | -Regulators -Sugar cane factories | year |

| Recommendation | How to implement | The agency entrusted with implementation | The time period for implementation |
|--|--|--|------------------------------------|
| <p>Focusing on reducing waste treatment fees resulting from the use of technological equipment in sugar cane operations, which are produced after the pressing process in sugar cane factories, which contribute to achieving sustainable development.</p> | <p>Preparing a study to determine how to benefit from waste resulting from sugar cane operations.</p> | <p>-Ministry of Supply and Internal Trade. -Sugar cane factories.</p> | <p>Two years</p> |
| <p>Paying attention to logistical activities and operations that significantly reduce the cost of energy consumption used in sugar cane transport operations, which helps in achieving sustainable development.</p> | <p>Developing and updating the procedures implemented in all stages of the sugar cane transport operations from the farm until reaching the factories.</p> | <p>-Ministry of Supply and Internal Trade. -Sugar cane factories. -Sugar cane farmers.</p> | <p>year</p> |
| <p>Training sugar cane farmers to use the latest modern farming methods, which include a high level of production, and explaining to them the returns and profits from it.</p> | <p>Preparing specialized training programs for sugar cane farmers.</p> | <p>-Ministry of Supply and Internal Trade. -Sugar cane factories.</p> | <p>Two years</p> |

| Recommendation | How to implement | The agency entrusted with implementation | The time period for implementation |
|--|--|--|------------------------------------|
| <p>The role of the Ministry of Supply has increased by paying attention to the sugar cane crop because it is considered one of the strategic crops that affect the national economy as well as the industry. It must be considered and provided with assistance to sugar cane producers.</p> | <p>Continuing to support the Ministry of Supply and Internal Trade through (continuous follow-up and control - providing training programs - integration between all parties).</p> | <p>-Ministry of Supply and Internal Trade.</p> | <p>Periodically</p> |
| <p>The number of roads leading to the farms where the sugar cane crop is located must be increased and paved in a way that does not hinder the process of transporting sugar cane and saves time and effort.</p> | <p>Developing a scheme for paving agricultural roads that impede the process of transporting sugar cane from the farm.</p> | <p>-Sugar cane factories. -Sugar cane farmers.</p> | <p>year</p> |
| <p>The increasing role of the Ministry of Supply in terms of encouraging sugar cane farmers in terms of increasing the price of a ton of sugar cane so that sugar cane farmers can cover the costs that fall on them to encourage them to grow it and not direct them to alternatives.</p> | <p>Continuing to support the Ministry of Supply and Internal Trade by raising the annual price of a ton of sugar cane.</p> | <p>- Ministry of Supply and Internal Trade.</p> | <p>Periodically</p> |

14. Future Studies

The researcher recommends that the same study be conducted, but applied to me:

- A Proposed System for Managing the Sugar Cane Waste Supply Chain to Increase Paper Production (applied study on Kom Ombo Sugar Cane Factory and Edfu ELap Factory)
- The role of logistics activities in agricultural crops on sustainable development by application to fruits in Upper Egypt.
- The role of logistical activities in agricultural crops on sustainable development by application to dates in Upper Egypt.
- The role of logistics activities in river ports on sustainable development by application to river ports in Egypt.
- The role of logistical activities in the chemical industries on sustainable development by applying to Kima factories in Aswan.
- The role of logistical activities in the extraction of granite on sustainable development by application to the Aswan granite mines.
- The role of logistics activities in the cement industry on sustainable development by application to Assiut cement factories.
- The impact of logistical activities in the iron and steel industry on sustainable development by applying ferroalloy factories in Edfu.
- The role of logistical activities in extracting gold ore on sustainable development by applying to gold ore extraction mines in the Red Sea
- The role of logistical activities in promoting Egyptian exports through the southern gate, Aswan, on sustainable development, by applying it to trade between Egypt and Sudan.

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