Roles Played by the Governments on Agricultural Logistics Operations during the COVID-19 Pandemic and Lockdown. A Systematic Literature Review

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Abstract:
This paper documents the roles played by governments in agricultural logistics operations during the global COVID-19 pandemic and lockdown. Specifically, the paper reports on the roles played by the Chinese Government as a case study for developed countries and the roles played by the East African countries’ governments. Systematic literature review was carried for existing literature published between December 2019 and June 2021. Hence, the study conducted systematically by reviewing related literature on roles played by governments in agricultural logistics operations during the global COVID-19 pandemic and lockdown. The paper found that every government has tried to put efforts to ensure the movement of agricultural products within and across the supply chain partners including exemption of food delivery trucks from road restrictions, fining some price-gouging businesses who seemed to make food less affordable; establishing measures to ensure availability of supplies of agricultural inputs for production, provision of technical services and financial support, introduction of robot delivery and exemptions from Value Added Tax (VAT) to agricultural products and related inputs. This study is review in nature and it based on China and East Africa countries only from December, 2019 to June 2021. So, empirical study is needed on this study. Also, adding study period could improve the quality of results. The study make immense contribution to the existing literature on the role of government in enhancing agricultural logistics amidst global supply chain disruption.

Keywords: COVID-19, logistics, Agricultural logistics, Lock down, logistics operations, pandemic.
result, the logistics operations were largely disrupted.

To rescue the situation, governments all over the world have played a big role to ensure smooth operations of logistics activities specifically for agricultural products and medicines. Rushton, Croucher, and Baker (2014) noted that, whether within the boundaries of the country or across the boundaries of the country the logistics operations are inevitable. There is no single place in this world that does not depend on raw materials, finished goods, semi-manufactured goods, labor, or services from other places. Therefore, logistics activities are needed to ensure the smooth movement of mentioned goods, human resources, and services from one place to another. During the COVID-19 pandemic and lockdown, there was a need to transfer medical devices and other facilities from manufacturers to hospitals and health centers (WHO, 2020). Food products were also required to be transported from farmers, national cereals warehouses to families and retail stores in order to ensure people are not suffering from hunger and other diseases caused by deficient nutrients from food (FAO, 2020).

This paper has tried to explain the roles played by the governments in China as a case study for developed countries and East African Countries as the case study for developing countries to facilitate the comparative analysis, specifically, for agricultural logistics operations during COVID-19 and lockdown. The roles played include but not limited to mandatory wearing of masks to all logistics participants, prioritized supply of agricultural products; less restrictions on movement of food delivery trucks; penalized some enterprises which were found price-hiking food prices; established measures to ensure availability of supplies of agricultural inputs for production; the provision of technical services and financial support; the introduction of robot delivery; and the provision of exemptions from Value Added Tax (VAT) to agricultural products and related inputs. This paper will be much fruitful because it enlarges the knowledge and skills not only of academicians but also of all logistics participants and government organizations responsible for facilitating logistics operations.

Following this introduction part, the next parts of this paper described theoretical literature reviews which clearly explain what other authors said on the roles played by the governments from different developed and developing countries especially during the outbreak of a pandemic. Furthermore, the paper explained the methodology used in collecting the data and data analysis. Finally, the paper explained lessons learned and recommendations on what to be done by the governments and other logistics participants during the outbreak of pandemic to ensure smooth logistics operations.

**Literature Review**

**Definition of COVID-19**

Coronavirus Disease (Covid-19) refers to an infectious illness caused by a coronavirus. The disease was first discovered in Wuhan, China towards late December 2019 (European Centre for Disease Prevention and Control (ECDPC), 2020). Also, Shereen, Khan, Kazmi, Abeer, and Siddique (2020) defined COVID-19 as a communicable and pathogenic viral infection caused by acute respiratory syndrome Coronavirus 2 (SARS-CoV-2), which was discovered in Wuhan, China.

**The concept of logistics operations**

Oxford Dictionary defined logistics as the detailed coordination of a large and complex operation. This means that logistics is all about the coordination of movement of physical products, financial flows and information flows forward and reverses from the place of manufacturing to the place of utilization for satisfying ultimate consumers (Lysons and Brian, 2016). On another hand, the Council of Supply Chain Management Professionals defined logistics as “the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from point of origin to point of consumption to conform to customer requirements,” (Haag, 2019, p.1).
The term logistics is comprised of upstream and downstream movements and return of materials for operational purposes. Operational logistics deals with daily activities include production scheduling, demand planning and forecasting, transportations from suppliers and receiving of inventory, production operations, and outbound operations which include fulfilment activities and transportation to customers (Rushton, Croucher & Baker, 2014). Therefore, logistics operation is all about ensuring the smooth running of upstream and downstream logistics activities continuously without stoppage. However, during the outbreak of the pandemic COVID-19 logistics operations were disrupted to a large extent which led to not only decrease in production, exports, and international trade, transportation, and logistics network but also an increase in logistics operation costs (Matt et al., 2020).

The Resource Dependency Theory Approach to Logistics Operations

This study was guided by the Resource Dependency Theory (RDT) which states that all organizations depend on resources for their sustainability. These are available from both their natural environment (within the organization) and external environment (that is, from other organizations) in the business industry (Pfeffer & Salancik, 1978; Fındıklı, 2019). A primary assumption of resource dependency theory is that reliance on “critical” and fundamental resources influence the course of organizations (Werner, 2008).

In the context of logistics operations, the resource dependency theory presents that there is inter-dependence between third-party logistics and government. While third-party logistics provides logistics services such as transportation motor vehicles and warehouse storage, the government is responsible to ensure the presence of favorable logistics infrastructures (Rushton, Croucher & Baker, 2014). According to Pfeffer & Salancik (1978), “One central hypothesis in RDT says that whoever controls resources has the power over those actors who need these resources” (p.18). All modes of transportation (roads, railways, pipeline, air transport, and water transport) are owned and controlled by the governments. The government is responsible to establish and monitor the implementation of regulations, policies, and guidelines regarding the use of transportation infrastructures (Lysons and Brian, 2016). The governments have both powers of restricting and allowing the logistics service providers to use the mentioned modes of transport.

On other hand, the government depends on third-party logistics in such a way that government collects revenue from them that will be used to ensure the presence of favorable logistics infrastructures and operation of other government activities. Also, the government depends on third-party logistics to facilitate the distribution of goods from manufacturer to the consumer to ensure their people are not suffering (Rushton, Croucher & Baker, 2014).

Methodology

Eligibility

The study used scientific articles published in English between 2019 December and June 2021. The study preferred empirical studies conducted either using primary or secondary data. The papers included in the study were those addressing how governments responded to various agricultural logistical challenges occasioned by COVID-19 pandemic. Apart from empirical papers, the study also included grey literature, mainly government reports, global organization reports and media reports to synthesize and provide context to the findings in the empirical studies. Articles were excluded basing on the research methodology, availability in English and a focus on agricultural logistics during COVID-19. Consequently, systematic literature review articles, general literature review or critical literature review were not included. Additionally, papers that were not entirely in English were also excluded.

Sources

The search was conducted on Google Scholar search engine, Scopus, and Research gate databases. The topical keywords namely
COVID-19, agricultural logistics and COVID-19, lockdown and agricultural logistics, food supply chain and COVID-19, were used to search for articles from the identified websites. The search was conducted by the research from June 15th to 24th, 2021.

**Results**

A total of 219 articles were identified from Google Scholar, Scopus and Research Gate. After checking for duplication, 106 articles were excluded leaving 113 articles for further screening. The 113 articles were screened, and 77 articles were excluded because 31 were literature reviews based on older studies done before COVID-19, and 46 could not be found in full text by the researcher. As such, only 36 articles were included in full text reading where 14 articles were excluded. The 14 articles were excluded because 6 articles were addressing logistical challenges and initiatives not related to agriculture and food supply chain. Five articles of the 14 were excluded because logistical challenges were not linked to COVID-19 while 2 were excluded for focusing on financial risks in agriculture during COVID-19. Thus, only 22 empirical articles were included in the review. To add on the empirical studies included in the review, 8 reports from FAO, World Health Organization, World Bank Group, East African Community, UNCTAD, China and Bank of Tanzania (BOT) were also included in the study. These reports were found by searching using a combination of key words on Google. The inclusion and exclusion criteria are shown in figure 1.

**Results and Discussion**

The roles played by the Chinese Government to ensure logistics operations during COVID-19 and Lockdown

Reviews were made from various literatures to know how the Chinese Government strived to ensure logistics operations during COVID-19 and Lockdown. As reported earlier, the number

![Figure 1. Inclusion and exclusion criteria](image)
of COVID-19 infections in China in January 2020 were increasing on a daily basis; hence the government of China had to start a series of measures to ensure that food supply is protected particularly in areas most affected as well as protecting her citizens (Shulang and Jia, 2020). In order to ensure logistics operations for agricultural products during COVID-19, the Chinese government played a number of roles as analyzed and discussed here under.

From the literatures, the first thing that the Chinese government did was to issue an order of increasing agricultural products. It was reported by FAO (2020) that the Chinese government instructed all Chinese food manufacturers to increase food and meat supply. Shulang and Jia (2020) report that the purpose of the government to provide this instruction was to ensure availability of agricultural raw materials needed in the manufacturing and processing industries like Shouguang so as to produce finished food products and to be distributed to most affected areas. This implies that the upstream logistics were permitted by the government of China to operate during COVID-19 and the lockdown period. At the same time, farmers were allowed to continue producing agricultural raw materials and transport them to the processing and manufacturing industry. Shulang and Jia (2020) further report that the manufacturing and food processing industries were allowed to continue producing food products and deliver finished products to final consumers especially in the places that seemed to have been strongly hit by outbreak corona disease. These findings support the assumption of Resource Dependency Theory which emphasizes that important resources normally influence organization actions towards other organizations.

Secondly, the study done by Chen, Zhang, Zhan, and Fan (2020) found that the Chinese government ordered that slaughterhouse to operate twenty-hours a day, and that food had to be distributed from agricultural zones like Shouguang to the most affected places. Apart from being locked down where all citizens were required to stay at their homes, the government allowed slaughterhouses to be open all the time to ensure availability of meat and related products and be delivered to processing industries and ultimate consumers. It is further reported by Chen, Zhang, Zhan, and Fan (2020) that pastoralists had a permission from the government to deliver their livestock to slaughterhouses. These findings imply that the Chinese government played a vital role in the operations of agricultural logistics activities during the COVID-19 pandemic and lockdown.

Thirdly, the Chinese government lessened road restrictions on food delivery trucks to maintain uninterrupted (Shulang and Jia, 2020). While there were high road restrictions and other modes of transportations as measures established by the Chinese government to avoid the movement of people from one place to another, the government provided exemptions to food delivery trucks from such restrictions to continue distributing food products across the country from the supply chain channels to final consumers. This exemption undoubtedly helped downstream logistics operations during the COVID-19 pandemic and lockdown.

Fourthly, the Chinese government is reported to have penalized business entities that were hiking price for food products (Chen et al, 2020). The intention of the government to fine those businesses was to ensure that food products were available at an affordable price to the end consumers. FAO (2020) is of the view that it is the responsibility of any government to set ceiling and floor prices in order to protect both producers and consumers. When COVID-19 pandemic broke out and lockdown was imposed, some business enterprises in China started to sell food products at a high price of which many consumers remained under pressure as they could never afford purchasing such products. Therefore, in order to solve this problem, the Chinese government fined all business enterprises that seemed price-gouging and making food less affordable as a measure to ensure the availability of food products at affordable prices (CHINA, 2020). These findings imply that the Chinese government played a great role in protecting consumers and stabilize the available market for agricultural products.
Fifthly, the Chinese government established measures to ensure the availability of farm inputs for agricultural production. From the literatures (FAO, 2020; CHINA and 2020; Chen, *et al*, 2020), the Chinese government was reported to have advised the farm input manufacturers to resume operations and increase workload while observing COVID-19 mitigation measures. In the situation where there was a shortage of inputs, the government organised for inputs from companies in other regions (FAO, 2020). For example, in Hubei Province, there was a huge shortage gap between the supply of agricultural inputs and demands due to lockdown restrictions. Therefore, the government sourced for more than 700,000 tonnes of fertilizers and 2,520 tonnes of pesticides from outside Hubei to fill the identified gap (Shulang and Jia, 2020). In addition, some Chinese local governments instructed farmers to place their orders of agricultural inputs via the internet to minimize physical contact. Once the inputs arrive, ‘point-to-point delivery is arranged to farmers’ homes. For example, in Shanxi province, the government of Yangling collects orders from more than 50 villages and has helped with more than 400 tonnes of fertilizer purchase and delivery (Lihua, Kun, Yining, Yimeng, 2020).

Sixthly, the provision of technical services and financial support was another role played by the Chinese government to guide and support farmer’s production. A vivid example is when the Ministry of Finance announced the reduction of credit guarantee fees in 2020 for agricultural firms that were critically affected by the COVID-19 pandemic (Chen *et al*, 2020). Furthermore, the Chinese government was reported to have allocated about USD 200 million to the Agriculture Sector as relief funds for purpose of controlling pests in rice and wheat plantations in Hubei (Shulang and Jia, 2020).

Seventhly, the transporters of agricultural products were allowed to use the green channel of transportation to guarantee seamless distribution of finished farm produce (CHINA, 2020). Green channel is a special lane where vehicles delivering fresh agricultural products were allowed to pass through it. It is characterized by less or no checks at highway toll stations. This helped the trucks to pass without being inspected which took short time to deliver the products to end consumers (FAO, 2020).

Eighthly, the introduction of robot delivery is another notably innovative measure taken by the Chinese Government in collaboration with the private sector to ensure logistics operations especially for the delivery of food products (Chen *et al*, 2020). For instance, companies as online stores for farm produce; and establish community shelves, neighborhood service points, and time-to-time delivery locations, and using robot delivery (Shulang and Jia, 2020).

Lastly, the Chinese government exempted agricultural products from Value Added Tax (VAT) and the related inputs during the outbreak of the COVID-19 pandemic and lockdown (FAO, 2020). The Chinese government through the State Administration of Taxation issued an announcement to the public during the corona crisis; any income from agricultural products and inputs is exempted from Value Added Tax (CHINA, 2020). The government did so for the purpose of enabling uninterrupted cargo transportation service hence shielding the food supply chain from vulnerability.

The roles played by the Governments of East African Countries in logistics operations during COVID-19 pandemic and lockdown.

Roles played by governments in agricultural productions.

Since the outbreak of the COVID-19 pandemic and the introduction of lockdowns, agricultural logistics was directly and indirectly affected. As the corona virus increased and affected many people, more lockdowns were experienced; as a result, the agricultural production system was disrupted.

To rescue the situation, the governments of East African countries tried to establish and implement some measures to rescue the situation. For example, the government of Tanzania through the Central Bank issued a special waive to commercial banks to relax terms
of ongoing loans (BOT, 2020). The study findings showed that from June 2020, the Tanzania Agricultural Development Bank (TADB) lowered interest rates on loans given to farmers from 12 percent to nine percent to relieve the burden to farmers and boost lending to the agricultural sector (Daily News, 2020 June 16). These findings imply that the government of Tanzania has played a big role to support upstream logistics operations in the agricultural supply chain system. Likewise, to boost the production of agricultural products, the government of Kenya issued the nutrition and diet guidelines which emphasizes farmers to produce more food crops to ensure a reliable food supply (MAFF, 2020). One of the initiatives undertaken by the Kenyan government was encouraging setting up home vegetable in both rural and urban areas (FAO, 2020).

The reduction of agricultural inputs’ cost was the other effort undertaken by the East African governments to boost production of agricultural products. For example, the government of Kenya through the Ministry of Trade abandoned its compulsory inspection fee farming inputs for six months, lowering the cost of agricultural inputs (MAFF, 2020). The findings imply that the actors of the upstream agricultural supply chain were benefited through government decisions, thus stimulating them in the production of agricultural products. Similarly, the study done by FAO (2020) in Uganda found that the government of Uganda has reduced import taxes on food and agricultural inputs as a way of inspiring agricultural production.

The provision of financial assistance to small-scale farmers is another role played by the governments of East African Countries to facilitate the production of agricultural products. For example, it was reported that in May 2020, the Government of Kenya had announced a stimulus package of USD 27.9 million to support the small-scale farmers by supplying agricultural inputs (FAO, 2020). Additionally, the government of Kenya assisted horticultural farmers to reach global markets by providing a grant of USD 14 million (MAFF, 2020). The findings imply that the government stimulated agricultural production by empowering small-scale farmers financially. Likewise, the findings support the assumption of Resource Dependency Theory that small-scale farmers depend much on the actions and decisions made by the governments.

Roles played by governments on transportation of agricultural products

The movement of agricultural products from manufacturers to retailers during COVID-19 and the lockdown period was inevitable during the pandemic. This is because some places within the country such as urban areas consume what they don’t produce while other places, particularly in the rural area, produce for export which leads to dependence syndrome across the local and international supply chains (Mchopa et al., 2020). Therefore, the following are roles played by governments in East Africa countries so as to ensure the smooth movement of agricultural products from suppliers to point of demand.

East African Countries, borders remained open for transportsations of necessities such as food and food-related items; with regard to transportation of agricultural products and inputs, the governments of East Africa Countries did not close their borders (FAO, 2020). They allowed the third logistics operators to transport food products from manufacturers to distributors across the borders Avetta (2020). But the truck drivers at each checkpoint were tested their temperature and helped with the fumigation of their vehicles to ensure fast and safe transportation. Also, upon arrival, the temperature for the truck drivers was taken, and their information was taken for tracing purposes (FAO, 2020). For example, the exercise of exportation and importations of commodities and agricultural inputs were continued cross back and forth from Kenya, South Sudan to Uganda (EAC, 2020).

The establishment of dry ports was one of the roles played by governments of East African Countries for purpose of ensuring logistics activities are operating during the COVID-19 pandemic and lockdown. Specifically, the government of Rwanda established Dry Port in

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Kiyanzi which was located about 10km from Rusumo Border Post (Uwamariya, Mukamurenzi & Safari, 2020). The Kiyanzi Dry Port facilitated the movement of agricultural products across the Rwanda’s border and helped in preventing the spread of COVID-19 (UNCTAD, 2020). All logistics participants from both the private and public sectors and clearance of goods were located at Kiyanzi Dry Port. The site was equipped with a medical centre and accommodation facilities for truck drivers put in place to help contain the spread of the virus by testing, enforcing control measures such as social-distancing for all workers at the borders and KDP (Uwamariya, Mukamurenzi & Safari, 2020).

The governments of East African countries put preventive measures to protect logistics actors from the spread of COVID-19. WHO (2020) reported that all governments in East African countries took preventive measures against the spread of corona virus. These mitigative initiatives are physical distancing, establishing hygiene regulations to protect drivers and other stakeholders, wearing masks all the time, testing, psychological encouragement, and others (World Bank Group, 2020). These established preventive measures were practiced while the logistics activities were operating as well without stoppage.

Issuing of transportation guidelines or instructions during COVID-19 and lockdown is another role played by all governments in East African Countries. For example, in April 2020, EAC issued a guide on movement of goods amidst the pandemic among member states (EAC, 2020). Likewise, the government of Tanzania on May 4, 2021, issued new directives about all incoming travellers are required to submit proof of a negative corona virus results not old than 72 hours (GardaWold, 2021).

The establishments of food distribution strategies were another effort made by governments in East African Countries which facilitated the operations of agricultural logistics activities. A specific example of a developed strategy is the one from Uganda which was issued on the 25th-March -2020 (Nathan et al., 2020). This strategy clearly stated how food products should be distributed to the citizens. Special attention was given to special groups located in Kampala; targeting micro business entrepreneurs, the aged, and women with special health conditions (Yinglun, 2020).

**Conclusion and Recommendations**

Basing on the study findings, it can generally be concluded that attaining sustainable logistics operations specifically for agricultural products amidst the corona virus pandemic and lockdowns is very difficult without the contribution of governments. It was found that the governments of respective countries played a vital role in enhancing smooth logistics operations within and across their borders. These roles include issuing transportation guidelines or instructions; establishing food distribution strategies, setting and implementing preventive measures to protect logistics actors, introducing dry ports, exempting lockdown for transportation of agricultural products and providing financial assistance to small-scale farmers.

Regardless the efforts made by the East African countries’ governments to ensure smooth operations of logistics activities especially for food products during the COVID-19 pandemic and lockdowns, still, some challenges were facing them which disrupted the logistics operations. Those challenges include rising of the agricultural inputs price imported from other lockdown countries, declining price of the domestic crops such as maize in Tanzania due to total lockdown of neighbouring countries as well as lack of collaborations among governments. The occurrence of locusts in Kenya and Uganda also affected the food supply to the respective countries. Therefore, this paper contributes knowledge to the scholars and academicians on the role played by governments towards logistics operations during COVID-19 and lockdown.

From the study findings and conclusion, the study recommends that there must be collaboration and coordination between the governments and private sectors at different...
levels of logistics for immediate and effective outcomes. Again, we need to diversify the distribution channels of agricultural products as it will help the food system resilience. Moreover, the paper recommends that African governments ought to adopt and start investing in the application of electronic commerce such as online stores for farm produce; and establish community shelves, neighbourhood service points, and time-to-time delivery locations, and using robot delivery system in distributing the final food products to their people as the Chinese government did.

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