Curriculum Vitae

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Career Objective:

Aspiring to become a renowned logistician in the food supply chain space. The motivation is to use the knowledge and skills acquired over the years of my training to help reduce the high levels of food losses in the developing economies where almost a billion people are food in secured. Result driven and hardworking individual with a proven record of accomplishment in the logistics and supply chain with excellent academic qualification, practical experience, interpersonal and communication skills who enjoys meeting challenges and finding solutions whilst meeting standards.

Key Skills Leadership and competencies

- ❖ Expert in the issues relating to logistics, transport and supply chain management.
- ❖ Natural team player and result-oriented who can lead, motivate and inspire others.
- ❖ Very good at impacting knowledge to the less experience in most levels of education
- ❖ Good communication, interpersonal reporting writing and presentation skills.
- ❖ Good quantitative, qualitative and analytical skills.

Educational Background

Year Awarded / Completion	**Institution**	**Qualification**
2020– ongoing	Kwame Nkrumah University of Science & Technology (KNUST), Kumasi - Ghana	Doctor of Philosophy (Ph. D.) in Logistics & Supply Chain Management.
2017– 2019	Kwame Nkrumah University of Science & Technology (KNUST), Kumasi - Ghana	Master of Philosophy (M. Phil) in Logistics & Supply Chain Management.

2015– 2016	Kwame Nkrumah University of Science & Technology (KNUST), Kumasi - Ghana	Advanced Diploma in International Logistics & Transport
2012– 2014	Kwame Nkrumah University of Science & Technology (KNUST), Kumasi - Ghana	Master of Business Administration (MBA) in Logistics & Supply Chain Management.
2009– 2011	University of Cape Coast (UCC), GHANA.	Bachelor of Education (B. Ed) in Mathematics & Social Studies
2005– 2008	University of Cape Coast (UCC), GHANA.	Diploma in Basic Education (General Programme)

Short Training/Courses/Conferences/Seminars/Workshops (Continuing Professional Development Records in Logistics and/or Transport or related field):

July 2022 A 16 –day Workshop for Trainer of Trainees by FAO on Postharvest Loss Management

August 2020 A 4-day Seminar on the theme "Planning and Implementation of Sustainable Transportation Infrastructure"

October 2019 A 2-day workshop on the theme "Vehicle Fleet Management" for Logistics Managers

March 2019 A day Seminar on the topic Logistics and Transport: A Catalyst for National Development"

Professional Affiliations:

- Chartered Member, Chartered Institute of Logistics and Transport (CILT)
- Member, Ghana Transportation Professionals Forum (GTPF)
- Member, Chartered Institute of Procurement and Supply (CIPS)
- Member, International Association of Public Health Logisticians (IAPHL)

Work History

- Has over eight (8) years working experience in the areas of Logistics Management, Operations Management and Project Coordination.
- Has over ten (10) years working experience in teaching mathematics and facilitation of Logistics, Transport and Supply Chain Management Programmes.

ASSESSING COLD CHAIN LOGISTICS PERFORMANCE, CAPABILITIES AND FOOD LOSSES

Motivation of the Study

It is estimated that about a third of the global food products intended for human consumption is lost along the food value chain before reaching the final consumer (FAO, 2017). Meanwhile, 26.4% of the world population live under moderate and severe food insecurity (FAO, 2019). Evidence from literature estimates that the financial loss due to quantitative and qualitative loss of food is about $940 billion. It also contributes to about 8% of the total global emissions of GHGs (Shaikh, 2019).

A third dimension is added in Ghana, a developing economy, though informal, based on the quantum of loss, the frozen food value chain actors redirect the quality compromised foods back to the market at the expense of human health. Also, the need to feed the ever increasing world population makes it obligatory to reduce the million tons of avoidable perishable foods that get lost along the food supply chain (Jedermann et al., 2014).

Xu (2021), argues that the inefficiencies in logistics practices such as packaging, transport and storage are the major causes of food losses, especially in the developing countries. These losses of food during transportation can be significantly reduced if the temperature of the transported products is measured and supplied without delay (Jedermann et al., 2016, Tan & Zhang, 2016).

White (2018), posits that it takes time and coordination to efficiently move a shipment under required temperature. Food loss assessment studies in the past have largely focused on dry supply chains (for example, maize, rice, cowpea) to the neglect of cold chain logistics network systems (for example, fruits, vegetables, fish, chicken products, cooked foods, etc) (Delgado et al., 2020). Using cold chain logistics to reduce the considerable level of food losses could be one of the effective ways of closing the gap in food requirements (Dou et al., 2016).

FAO, (2019) argues that improper food handling and poor processing technologies are the main causes of postharvest losses, which represents a significant loss (3% to 20%) in certain food commodities (e.g., fish). For cold chain management to be efficient, three major elements are required, well trained personnel, reliable transport and storage infrastructure as well as efficient management procedures (US Department of health and human service, 2015).

All the aforementioned requirements are completely missing in the Agricultural supply chain (ASC), particularly, in the developing countries where there are inefficiencies in the transport and storage of food products. The study will use two important food commodities (frozen fish and

chicken products) in Ghana to examine the relationship between cold chain logistics performance, capabilities and food losses.

Literature areas

It is expected that food production will increase from the current 60% to 110% by 2050 due to increase in population (Garnett, 2013). In spite of this, there is increasing rate of food losses in the face of increasing human population and global food price hikes. Losses of horticultural crops in general, and fresh fruits in particular, are quite crucial challenges within developing countries (Hailu and Derbew, 2015). Gustavsson et al, (2011) estimated that 1.3 billion tons of food is lost globally, every year. Food loss refers to the edible parts of plants and or animals produced or harvested for human consumption but not ultimately consumed by people (Yildirim et al., 2016). This phenomenal is perceive to be a global challenge and that effort is been made to bring it to the barest minimum. The current rate of food losses is considered as one of the significant threats to sustainable development (Surucu-Balci and Tuna, 2021). Because food loss has a negative impact on the economy, environment and society (Alamar et al., 2018; Halloran et al., 2014; Gustavsson et. al, 2011). Not only that, food loss increases the cost per unit for consumer, while at the same time diminishes farmers' and food value chain actors' income and increases their expenses (Lipinski et al., 2013; Buzby and Hyman, 2012).

Although the exact causes of food losses vary throughout the world, and are very much dependent on the specific conditions and local traditional practices in a given country. Findings from the extant literature indicate that poor management of perishable food items, stakeholder attitudes, buyer supplier agreements and supply chain interruption are the major causes (Chauhan et al., 2020). Although the market demand for cold-chain logistics of agricultural products in Ghana is growing rapidly, the technology and scale of cold-chain logistics in Ghana still lag behind the developed countries, resulting in large energy consumption and food losses. Many authors have studied the efficiency of cold-chain logistics and particular food product for example fish or chicken products separately on quality issues by using experimental approach. Yar et al, (2020), assessed and compared the microbial quality of imported frozen chicken parts from three major import countries (United States of America, the Netherlands and Brazil) into the Kumasi Metropolis of Ghana. The results highlighted the presence of potential foodborne pathogens which was linked to possible contaminations at slaughterhouses and transportation from ports to cold storage facilities over long distances with several freeze-thaw cycles.

Setufe et al (2021), conducted a study to investigate the socio-economic analysis of small-scale frozen fish enterprises in the Sunyani Municipality. The authors found that the perishable nature of the fish was a severe barrier to the frozen fish business due to severe losses suffered by fish sellers in the study area. Limiting the study of the extant literature to only a region and particularly excluding the entry points of these products, that is, Tema and Takoradi township could account for the reason why much have not been realized in terms of reducing food losses.

Simpah et al, (2022), assessed meat and fish safety knowledge, and practices of cold store operators and table-top meat and fish sellers in Kumasi. The authors recommended for further studies and

interventions to bridge the existing gap between knowledge and practice in the frozen meat and fish industry. Ren et al, (2021) argue that a continuous and uninterrupted cold chain temperature and humidity environment is the basis for ensuring meat quality and safety. Judging from the above, the current study which seeks to trace the products from the Tema and Takoradi Harbours, through Kumasi and Sunyani to Tamale and also focusing on the cold storage and refrigerated transportation is timely.

Research Questions

In order to achieve the objective above, the following research questions will be asked;

1. What is the influence of cold storage facility performance on food losses?
2. To what extent does refrigerated transport performance affect food losses?
3. To what extent does the operational capability, human resource capability and traceability capability moderate the relationship between the cold chain logistics performance and food losses?

Potential Contribution from the Study

This study is expected to provide three useful contributions to industry stakeholders, policymakers, the government, and other researchers

Firstly, introducing the social practice theory (SPT), perishable inventory theory (PIT) and resource dependence theory (RDT) into the food value chain literature contributes to knowledge. This is in accordance with the argument by Abualtaher, (2022), that food-loss reduction requires a systemic paradigm shift, thus, changing attitudes, practices, technologies, and developing strategic policies. Thus, an investment in cold storage facilities and cold vans should be done by the government in partnership with the private individuals so as to make it affordable for the other actors within the food value chain.

Secondly, the study theorizes that operational capability, human resource capability and traceability capability enhances the negative relationship between the cold chain logistics performance and food losses. Yar et al., (2020) find that chicken thighs, backs and wings imported from Brazil, the Netherlands and USA to Ghana, a developing economy recorded varying rates of bacterial contaminants. Meanwhile, as a measure to check potential foodborne diseases associated with the consumption of unwholesome products, FDA permits for clearance only imported products that have at least 60% of their shelf life remaining on arrival at the port (FDA, 2019; FDA, 2013). Findings from this study could be used as reference point for policymakers and the government promoting and enhancing cold chain logistics practices in the developing economies.

Lastly, whereas the present study addresses some important theoretical issues, it also enriches context-specific knowledge of cold chain logistics performance from Ghana, a developing economy. Not only the drivers of food losses are prevalent in Africa (FAO, (2019), cold chain stakeholders often measure temperature along the supply chain of fresh produce (Shoji et al., 2021). The temperature in this context is typically monitored only in one segment of the entire

cold chain, namely from the supplier until the air or sea port. Such cold chain logistics operations are purely export oriented. Meanwhile, large quantities of frozen fish and chicken products are imported into Ghana (FAO, 2019). The flow of these products along the food value chain takes a reverse direction with little monitoring leading to massive food quality issues. The researcher provides solution to the actors in the food cold chain by creating the awareness of monitoring the cold chain practices from the importers, distribution centers (DCs) until the retail stores.

Methodology

Research Design

The research design illustrates the general outline and plan of the research work. According to literature the research design is the driving force that determines how the entire research process will be conducted, the data collection procedure and process as well as the analytical tools and techniques that will be applied in the work. The choice of the research design is generally motivated by the research objectives and the purpose for conducting the research work. According to Snyder (2019) two major forms of research design are found in the literature. These include the qualitative research design and the quantitative research design.

The type of research design that allows the researcher to test the causal relationship between variables is known as the quantitative research design. It is the type of research that relies solely on numerical data as a valid information. It is based on the positivism philosophical disposition which allows the researcher to test theories through the use of hypothesis development and evaluation. Quantitative research therefore focuses on the use of inferential analytical tools to analyze the data with results presented in numerical formats (Creswell, 2009). Data collection instruments used in quantitative research are usually structured questionnaires.

This study therefore adopts the quantitative research technique to examine the linkage between the study variables. The usage of this approach is justified on the grounds that the study seeks to establish the causal links between cold chain logistics performance and food losses. A number of hypotheses have also been stated a priori for which statistical analytical tools are required for confirmation or rejection. The quantitative research design is therefore found to be suitable for this work.

Selection of study sites

The study areas for this research work are Tema and Accra in the greater Accra region, Takoradi and Tarkwa in the western region, Kumasi in the Ashanti region and Tamale Municipality in the Northern region. These towns were selected due to their strategic and their relevance to this study. For instance, Tema and Takoradi are the two main entry points for the importation of fish and chicken products into Ghana. Kumasi Asafo market was also chosen because it is the largest frozen foods market close to consumers in Ghana (Yar et al., 2022). The Tamale Municipality in the Northern Region of Ghana was selected because it has the largest frozen food market close to consumers among the five regions in the in the northern part of Ghana (FDA, 2022).

Population, Sampling, and Choice of Informants

This section presents the population of the study, the sampling procedure, and the study's target population.

Study Population

The population of a study refers to all the elements who qualify to be selected to be part of the sample of the study. According to literature, the population of the study involves all the elements or members within the study setting. In this work the study setting is narrowed to the actors in the temperature sensitive food industries in Ghana. The sample frame is taken from the list of licensed cold storage facilities firms in Ghana as at July, 2022 from the storage facilities department (FDA, 2022), which provide both cold logistics transportation and cold storage services registered with the Food and Drugs Authority (FDA), Ghana. Inside the section of the sector, there are 578 firms located in Ghana, the respected study area indexed in the FDA, Ghana website as at July, 2022. In this study, the author focuses on four regions in Ghana, namely, Greater Accra, Western, the Ashanti and the Northern.

Sample and Sampling Technique

The sample is the subset of the population that the researcher is interested in. According to Saunders et al. (2012), the greater the sample size, the smaller the chance of error when generalizing to the population. They went on to say that a researcher's sample size selection should be driven by the following factors: First, the researcher's personal belief in the information gathered. Second, the research can accept a certain margin of error. Third, the researcher's specific studies, and finally, the size of the entire population from which the sample is drawn. For years, scientists have argued over what constituted an adequate sample size (Khine, 2013). While some academics, such as Singh (2006), believe that there is no universally accepted definition of a desirable sample size, others, such as Pallant (2007), believe that the greater the sample size, the better. The target respondents were the actors within the frozen food industry in the study area. Though these regions have 354 operational facilities, a total of 248 facilities were selected representing 70% of the FDA approved cold storage facilities in these regions. According to Yamane (1967), 53% sample size is normally considered as the minimum threshold representation of the total target population for analysis. The target population was 354 but the proportional sampling was approximated to 70%, giving sample of 248. However, by geographical or ecological location of the frozen foods value chain actors (across the country, the target population were grouped into clusters. In all, 4 clusters made up of 4 regions were formed in the 4 operational areas selected. Random stratified sampling procedure (Harris and Lindblad, 1997) was used to select respondents in the clusters, aiming to ensure that, the final sample was a good representation of the different sub-category (cold chain actors within the same geographic or ecological zone). A final purposive selection of 248 cold chain actors across the 4 regions were selected for the survey. The study adopted purposive sampling method to select 248 respondents from selected frozen fish and chicken products actors from the selected regions.

Yamane's (1967) formula was used to determine the size of the sample.

n= N/ (1+N (e^2)), where: n = sample size; N = target population; and e = level of precision. Expected precision level = 95%, the sample size was: (n) = 354/ (1+354 (0.05^2)) = 248.

Based on this, a sample of 250 respondents (70% of the target population).

SELECTED REGIONS AND THEIR LICENSED COLD STORAGE FACILITIES IN GHANA AS AT JULY 2022 (FDA, 2022)

REGIONS	NUMBER OF COLD STORAGE FACILITIES	PROPORTIONAL SAMPLING 70% OF THE FDA REGISTERED FACILITIES
GREATER ACCRA	228	160
WESTERN	73	51
ASHANTI	30	21
NORTHERN	23	16
TOTAL	**354**	**248**

Data Collection

Data collection is the process of gathering and measuring information on targeted variables in an established system, which then enables one to answer relevant questions and evaluate outcomes. Data collection is a component of research in all fields of study including physical and social sciences, humanities, and business. While methods vary by discipline, the emphasis on ensuring accurate and honest collection remains the same. The goal for all data collection is to capture quality evidence that allows analysis to lead to the formulation of convincing and credible answers to the questions that have been posed. Examples of data collection instruments are informal and formal surveys, direct and participatory observation, interviews, focus groups, expert opinion, case studies, questionnaires, interviews and literature search. The data collection technique that are commonly used in mixed method approach was questionnaire. The research instrument that was employed for the study was questionnaire.

Questionnaire

A questionnaire is a sample tool composed of a series of questions and multiple chances to collect feedback from respondents (Mellenberg, 2008; Zaza, Wright-Deet al., 2000; Lewis, 2015). A questionnaire is an economic instrument for surveying large samples in specific geographical areas of a nation. The study's use of the questionnaire was much less onerous. Questionnaires decrease prejudice that might arise in the sample. Also, by utilizing questionnaire responses are received in a standardized way so they are more accurate about their replies. Dornyei (2001) states in the mist of all this value of using questionnaires for the analysis that many have doubted the validity of the

questionnaires. Dornyei gives a description of the authenticity challenges, and one of the issues raised is the statement that citizens do not always have true answers for themselves. Dornyei also insists that some respondents may provide a' good guess' about what the ideal, appropriate, or anticipated response is, and some of them will provide this answer even if it is not valid.

Pre-Testing of Questionnaire

A pre-test refers to a trial administration of an instrument to identify flaws or errors. When a questionnaire is used as an instrument to gather data, it is necessary to determine whether questions and directions are clear to respondents and whether the respondents understand what is required of them. An informal pilot study was conducted with 44 respondents. Conducting a local pilot study allowed the researcher to ask participants for suggestive feedback on the questionnaire and also helped eliminate author bias. This pre-testing was done with the actors in the frozen food value chain in the Bono Region of Ghana.

Managerial Implications

Creating awareness and developing knowledge of efficiency in cold chain logistics performance is of strategic importance in food loss reduction. However, such knowledge will be less useful and potentially misleading if the actors are constrained with the required cold storage facilities and cold vans. A sound appreciation of the resource dependency theory as used in the study, as a conceptual domain of the capabilities is a crucial step towards enhancing and effectively managing cold chain logistics operations so as to reduce the rate of food losses to its barest minimum.

References.

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