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China's Impact on Sierra Leone's Agricultural Productivity and Value Chain through the "Feed Salone" Project—Success or Failure?

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ABSTRACT: This paper examines China's critical role and contributions in the ongoing Feed Salone project which has continued to showcase their immense contributions to West African nation's food sufficiency drive. Food sustainability is important for any economy; hence Sierra Leone initiated the "Feed Salone" government priority project with China's collaboration to boost agricultural productivity and enhance the value chain. The study examines the impact of China's contributions to Sierra Leone's agriculture sector, focusing on their contributions to the Feed Salone initiative.

Institutional theory was adopted to examine the nexus between the study variables and its environment. Data was collected from 702 key stakeholders and project beneficiaries, primarily young males between the ages of 25-35 (48.4%) of the research sample. Only 9.0% of the total respondents hold a bachelor's degree and 36.9% lack formal education. Most respondents (67.2%) have 3-5 years of work experience, and 73.1% are farmers.

Accordingly, 72% of the total respondents acknowledged China's role and contributions to the Feed Salone Project while 17.4% of respondents consider China's donations as humanitarian aid. However, 78.6% of respondents think that such support from China boosts bilateral relations. The project has, however, been able to provide significant employment opportunities; 69.5% of all jobs are in the self-employed sector. A 43% increase in cultivated land indicates that it has also increased agricultural activity. Government cooperation with land-owning families has relaxed land restrictions, with technical guidance from Chinese professionals playing a significant role in this development.

The findings suggest raising educational standards to encourage creativity and retain talents in the agriculture sector. Sustaining expansion requires funding for programs aimed at career advancement, professional development, and agricultural education. Enhancing data collection and effective monitoring systems will also improve resource optimization and project appraisal. For Sierra Leone's farming enterprises to succeed and complete the agriculture value chain, it is imperative that certain trade restrictions be removed, markets be opened, and infrastructure be developed.

Keywords: Feed Salone, Sierra Leone, Agricultural productivity, Food sufficiency, Value Chain

I. Introduction

Approximately 820 million people, or 11% of the world's current population, are undernourished in terms of energy intake, and 1.3 billion people, or 17%, suffer from micronutrient deficiencies (FAO et al., 2019)[1]. However,

the majority of these startling population statistics reside in Asia and Sub-Saharan Africa (SSA) (Grote, U. et al., 2021)[2]. There is a current increase in the number of people who are food insecure around the globe, for instance, in 2021, lower-income countries which are mostly made up of Asia and sub-Saharan countries were estimated to be 1.2 billion, a number that almost 291 million people higher than it was in 2020 (Baquedano, Felix G., et al. 2021)[3]. However, 85% of this estimated 291 billion people are from India and Sub-Saharan Africa. Despite strong expectations that the world would have recovered from the deadly coronavirus (COVID-19) and advanced with improvements in food insecurity and hunger, it still faces rising rates of hunger and food insecurity after 2021 (FAO, IFAD, UNICEF et al., 2022)[4]. These alarming figures continue to demonstrate that unless strong national and international actions are taken to combat the problem of food insecurity and hunger, not only Africa but the entire world is at risk of food insecurity. This is why it is anticipated that the COVID-19 epidemic would have made matters worse for the millions of people who are now food insecure and vulnerable, particularly in Sub-Saharan Africa (Johnson, R. A., et al., 2022)[5]. One of the few areas of the global economy that is doing well and taking the spot is the agriculture and food sector, which is anticipated to stay that way due to significant underlying growth factors like population growth, urbanisation, and the rise of the middle class (KPMG, 2013)[6]. With the growing relevance and the pivotal role played by the agriculture sector in contributing to almost 20% emission of greenhouse gas (GHG) and also serving as the main driver of 90% of global deforestation, this sector has the potential to reduce emissions, and removing and storing carbon via the implementation of sustainable agriculture practices that ensure reduced conversion of forests, ecosystem restoration and reforestation, and soil conservation (Voora, V.C. et al., 2022)[7]. Subsistence farming methods practised by smallholder farmers who produce the majority of food stuff of most countries have still not increased due to some of the major constraints, are faced with seasonal variations which exacerbate the food insecurity situation at different times of the season. This is however, due to a lack of sustainable agriculture practices by these smallholders limiting the full utilisation of the food value chain, such as production inputs, infrastructure challenges limiting access to trading capital, impeding the ability to increase the supply operations, processing challenges of low-quality products which cannot compete with imported products, are among the most vulnerable population for food insecurity in developing countries (Leão, R.E. et al., 2023)[8]. This reality leaves these third-world nations in an improvised situation and a struggle for basic food. However, these have not left Sierra Leone untouched, but it settled for less from being a net exporter of rice in the mid-1950s to now a net importer in the last few decades (E. Graham, 2020)[9]. The 2023 year saw a rise in both severe and moderate food insecurity in Sierra Leone (WFP, 2023)[10] and a big challenge toward the sustainable development goals (SDGs) especially Goal Two (Zero Hunger) and Goal Seventeen (Partnership for the Goals). Because food security the top of the current government's agendas, it has however, seen the need for considerable political willpower and strategies to support in addition to economic reasons to invest in the agriculture sector to be able to provide sufficient food for its growing population.

For over sixty years and counting, China has been committed to providing cooperative developmental support to developing nations under the framework of South-South cooperation as they continue to push towards making concrete strides to the achievement of the UN Millennium Development Goals (UN-MDGS) while also paying premium to the context of the United Nations 2030 led agenda for sustainable development goals (SDGs) (CIDCA-UNDP 2018)[11]. In the drive towards the achievement of the sustainable development goals, the Asian economic giant is not only domesticating it efforts but also extending an olive branch to other developing nations around the world. Agriculture is among the focus of China's $60 billion BRI-promised investment penetration in the African continent (A. Dianjaya, 2019)[12]. However, the Chinese increasing outward foreign direct investment (OFDI) in African agriculture has sparked controversies about its impact on host nations. The Sierra Leone agriculture sector is dealing with issues brought to it by the fast advancement of technology, the need for bio-fuels, increased information availability, climate change, and other environmental and regulatory factors. Throughout the value chain, these factors are becoming more apparent through increased volatility, complexity, and scrutiny.

Food insecurity has continued to be a persistence challenge for millions of people around the global community which has been exacerbated by negative shocks to income, prices, or food supply (Baquedano, Felix G, et al., 2021)[3]. So, every nation is now intensifying on ways to be food secured even amidst challenging times like during Covid-19 pandemic. Given the readiness for Sierra Leone to join other countries around the world, like China, in increasing food productivity to feed its growing population, the current president has prioritised agricultural productivity through the "Feed Salone" project. The excruciating reality about Sierra Leone is that despite the estimated 5.4 million hectares of fertile arable land available for use, 80 per cent of the food consumed in the nation is still reportedly imported from other countries as this estimated 5.4 million hectares of fertile arable land are still uncultivated to a 75 per cent extent (MAFS, 2022)[13]. As the challenge to end hunger, food insecurity and all other forms of malnutrition continues to take prominence (FAO, IFAD, UNICEF, et al., 2022)[4], mmodernizing

agriculture is essential if African nations are to experience autonomous and long-term growth in the sector. This why this research will use the Feed Salone project, a Sierra Leone government initiative that aims to modernise agriculture, increase food sufficiency and provide agricultural investment, productivity, and value addition to boost economic development and food security, as a focus point to critically examine the impact of Chinese contributions to agriculture productivity and value chain, investigating whether China's role is a historical success or a mishap.

This research will contribute valuable insights for policymakers, agricultural practitioners, and international development stakeholders, fostering informed decision-making and sustainable collaborations to ensure food sufficiency of nations. By focusing on the specific case of Sierra Leone, it will provide practical implications and context-specific recommendations for Chinese contributions to the agricultural food value chain that contributes to the development of the West African nation's food sufficiency drive. It will analyse its strengths and weaknesses, suggest paths that will propel the two nations to the success of a common objective and shared value in agriculture, and determine whether such synergy represents a "misery" or a "history-making success," which largely defines the structure of the written narrative in this compositional setting (Patnaik, S., Pandey, S. C. 2019)[14]. While looking at the practical implications of the two countries bilateral cooperation, we will establish a practical framework and recommendations according to the findings. In this research we will specifically try to:

I. Assess the impact of China's contribution to agricultural productivity and food value chain in the Feed Salone Initiative.
II. Examine the implementation strategy of the Feed Salone Initiative and how it aligns with current global food insecurity tackling measures.
III. Identify challenges and opportunities associated with the Feed Salone initiative and provide practical recommendations to policymakers, practitioners and future researchers according to findings

II. General Overview of the Feed Salone Project

Sierra Leone is blessed with an estimated 58% of its total land being arable land with four distinct regions: coastal mangroves, woodland, upland plateau, and mountains, and a tropical climate receiving around 2,500 mm of rain a year (MAFS, 2022)[13]. This West African nation and the bulk of its rural population work in the production of rice, which is the popular staple meal of the land. Despite it being a staple food in nearly every family in Sierra Leone, the nation has not been able to grow enough rice to satisfy domestic demand (FAO Report, 2021), which has resulted in the country now importing more rice than it exports, costing the nation approximately $240 million a year. Another FAO 2022 report stated that for the country to meet its demands for consumption, it imported most of its wheat and rice. Their report also forecasts that imports of rice are expected to reach 480,000 tons in 2022, a 20% annual rise and around 25% over the five-year average. This increase is due to both rising domestic demand and the continued need to support the local supply after production fell in 2019 and 2020. In an endeavour to maintain food security and increase agricultural productivity, the 'Feed Salone' project was introduced by President Julius Maada Bio as one of his top five objectives. This well-intentioned initiative seeks to preserve national sovereignty by bolstering the nation's agriculture industry, encouraging self-sufficiency, and lowering reliance on food imports. During his second tenure, the president prioritized food self-sufficiency and established a five-year time frame for accomplishing this important ambition.

Understanding how vulnerable and weakening it is to rely solely on food imports, the new SLPP government manifesto is dedicated to raising agricultural productivity in order to promote inclusive growth, raise food production, reduce hunger, increase export revenue, create jobs, and strengthen the nation's resilience (MAFS, 2022)[13]. It is pertinent to understand the various institutional entities that were set up for the success of the Feed Salone Project, which was also discussed during Parliament Tenth Report of the Committee on Appointments and the Public Service presided over by Hon. Mathew Sahr Nyuma, Leader of Government Business. To support the Feed Salone project, the Member of Parliament urged the National Public Procurement Authority (NPPA) nominee to go above and beyond what his predecessor had done, and he asked the Sierra Leone Authority (SLRA) to consider Samu-Kitchum Road for this is an externality that can contribute to the success of the project (Jacobs. G., 2014)[15]. Parliament's initiative in this project is to prioritise the important areas of action in order to de-risk private sector involvement in agricultural finance and increase access to financing for smallholder and large-scale farmers, it is to create an Agriculture Investment Bank under a Public-Private Partnership (PPP) (MAFS, 2022)[13].

Both the Food and Agriculture Organization of the United Nations (1993) and the International Service for National Agricultural Research (1984) appear to be sympathetic to the structural arrangements put forward by the Feed Salone project. Consistent with the myriad of the literature of this study, there are important ramifications for the requirement of a management analysis before development aid project planning. However, the days of a prescriptive model that can just be imitated from another nation and seem to be applied elsewhere have elapsed. The

institutional framework on the Feed Salone project under President Bio, the country's current president's new direction government has seen the establishment of a Presidential Council for Delivering on the mandates of the initiative, which seeks to support and guide the Ministry of Agriculture and Food Security (MAFS) strategically. In order to improve the agriculture sector, the Council will recruit national stakeholders, obtain support from development partners and important actors, and work towards drawing in both local and foreign investments. In order to increase productivity, it will support important value chains, guarantee policy coherence, and supervise MAFS and associated agencies' provision of agricultural services. There is also an established Feed Salone Secretariat that is responsible to provide administrative and technical support. By constructing a strong monitoring and assessment system in line with the Medium-Term National Development Plan (2024–2028) and other national policies, the Feed Salone Strategy seeks to enhance MAFS's effective performance. Creating a new National Agriculture Census and enhancing the Ministry's ability to finance and implement projects that are ready for investment are two examples of this initiative's drive. The plan also calls for offering farmers advice services and enhancing the private sector's involvement in service delivery, value chain financing, technology transfer, and information sharing(MAFS, 2018)[13].

The Chinese have been playing critical roles in the agriculture activities of the country through their mechanized farming activities, support of machinery, tools, improved varieties and other farming implements to the government and other farming cooperatives, and providing field experts. The Chinese even owned some of the biggest agricultural farm sites in the country. For instance, they owned the biggest sugar production company, the "Complant Magbass Sugar Complex Co. Ltd.", in Tonkolili District in Northern Sierra Leone, despite that there has been a halt in its production activities since 2019. Their support through expertise in agriculture to boost food productivity and sufficiency worldwide and in Sierra Leone cannot go unnoticed. As recently as July 31, 2023, a team of Chinese agricultural experts landed in Sierra Leone to assist the West African nation in achieving the re-elected president's "FEED SALONE" ambition. This ambition stood as the number one priority of the president's second-term commitment to the nation.

The President of Sierra Leone, H.E. Dr. Julius Maada Bio on 1st November, 2023 received some agricultural machinery from the Chinese government to boost the country's ongoing efforts at tackling food insecurity through 21st-century farming techniques. The country has recently established farm service centres that would hold machines, equipment, and tools, as well as a training facility, a mechanical workshop, and a storage and administrative block that would also serve as a hub base for seeds, agrochemicals, and fertilizers with resident experts and extension workers. One of these centres is located in Gberay Junction in Port Loko District to serves farmers around 100,000 hectares of the rice bowl of Kambia, Port Loko, Tonkolili, Falaba, and Koinadugu Districts in the northern region of Sierra Leone, and another is located in Bo to serve 160,000 hectares of arable rice-producing areas of Bo, Bonthe, Pujehun, Moyamba, and Tonkolili District". This support from the Chinese government included 400 Mobile Rice Threshers, 400 Winnowers, 60 Rice Whiteners, 400 Brush Cutters, 500 Rice Transplanters, 100 Chain Saws, 400 Knapsack Manual Sprayers, 200 Repair Tool Kits, 100 Hand Drills, 5 Diesel Generator Sets, 200 Grease Guns, and 10 Diesel Welder Sets (Koroma Abu, B. CWAS 2023). These machines donated through the generosity of the People's Republic of China are a huge complement to the machine rings that the country wants to leverage to increase food productivity.

The National Sustainable Agriculture Development Plan (NSADP) (2010–2030)[16] has laid out goals and a framework to make the agricultural sector a more productive one that is efficient, competitive, and well-managed for the country's growth. This is because despite the sector's growing impact on the country's GDP of over 40% each year and providing up to 70% of jobs to its growing population, it was still not given the needed attention. There are concerns about land grabbing, environmental damage, and income inequality which has continued to call for a focus of such assistance on technology transfer, infrastructure development, land policy reforms and capacity building to help Sierra Leone increase agricultural productivity (Brautigam and Tang Xiaoyang, 2011)[17]. However, policies in the agriculture sector have only recently begun to take shape to build a better nation that will be self-sufficient in terms of food. The NSAD has been formulated to provide short, medium and long-term Investment programmes in the agriculture sector, a programme that hopes to ensure economic growth and increased revenues to households, firms and the state so that basic services (health, education, etc.) will be provided to the population (NSADP, 2010)[16]. The Ministry of Agriculture has also collaborated with the Comprehensive Africa Agriculture Development Programme (CAADP) and the United Nations Development Programme (UNDP) to build a series of short, medium, and long-term investment programs and strategies for food sufficiency and security which include intensifying agricultural productivity; promoting agricultural commercial and investment; improving technology, research, and transportation; and improving all facets of the sector's management (ibid). Also, a fundamental component of the country's Mid-Term National Development Plan (MTDP 2019–2023) and a crucial component of

the methods to improve rice self-sufficiency, spur economic growth, and raise rural income is improving local rice production to lower import duties and create jobs. The MTDP's policy actions for 2019–2023 include diversifying the fishing, tourism, and agriculture sectors.

III. Ministry of Agriculture and Forestry Policy Shift (MAF-PS)

As Sierra Leone is one of the third-world countries that is striving to increase food productivity to feed its growing population, it continues to face eminent challenges as crop production difficulties affect one-third (1/3) of the producers, with pesticides being the most prevalent (FAO, FAO-DIEM report, 2024)[18]. Further to this sad reality, the difficulties brought by low-quality seedlings, a lack of equipment, and difficulties in accessing credit facilities are among the several appalling situations and are becoming the new face of the trending challenges facing the farmers. However, seasonal variations in the agricultural field are exacerbating the already existing challenges as they contribute to undernutrition in major agrarian economies around the world (Bonuedi, I.L. et al., 2022)[19]. Research works that have looked into seasonal food variations and food security has found that households that have better access to markets consume more diverse food diets and are more food secure in all-around seasons than those without access (Bonuedi, I.L. et al., 2022: Devereux, S.R. et al., 2012)[19,20]. However, the impact of this seasonal variation can lead to drought or flooding with adverse consequences for the agricultural sector, cost of jobs, diseases, and pest prevalence (Devereux, S.R. et al., 2012)[20]. Both government and development partners need to pay more attention to issues such as technological change, sustainable employment, and local resource development (Baffoe-Bonnie, A., 2018: Zhou, X. et al., 2022)[21,22], which are all contributing factors to an effective and sustainable food value chain. It is, however, estimated that for Sierra Leone to close the gap between the production of the major staple foods and local demands, it needs a total of over $1.6 billion over 5 years (Feed Salone Strategy, 2023)[13]. This will increase export revenue and ensure a food-secured country. This can further impact dietary deficiencies and is more severe in tropical rural areas during the lean period of farm produce.

IV. Historical Perspective of China Agriculture Investment Overseas

One of the main focuses of China's development assistant in the West African nation has been agriculture and given agricultural supports to African nations is not only a crucial area of collaboration between China and African countries but it's also a shining example of China's involvement in global development cooperation (CIDCA-UNDP 2018)[11]. Since the end of the 11-year civil war in 2002, China has been the biggest trade and investment partner with the West African nation, with investments in several key areas including health, agriculture, infrastructure, and human resource development. Its lucrative economic investment package, backed by a flexible political approach, and focused big-ticket development projects under the Belt and Road Initiative (BRI) provided an ostensibly massive opportunity to African countries in the recent two decades (Lokanathan, V., 2020)[23]. This impact of such agricultural support and contribution to Sierra Leone can be seen from several perspectives; on one hand, these investments improve agriculture, increase access to modern agricultural technologies and increase the productivity of local farmers, on the other hand, it brings about sustainable agricultural development.

Since the current government took over power in 2018, its focus moving towards 2023 when it went for re-election, through its national development plan has been, growing the human capital, agriculture productivity, and infrastructure development (GOSL and MCC Report 2021)[24]. The coronavirus disease which hit the West African nation around April 2020 brought with it excruciating realities that aggravated the crisis (Johnson, R. A. et al., 2022)[5]. This reality and a focus on food security brought about what the president referred to as the five game changers, a key message and development targets in his second-term manifesto. Food security is the priority item of the five game changers in his party's manifesto document that was later transformed into his governance trajectory.

In recent years, China has provided aid and financial assistance to various agricultural projects in Sierra Leone (World Bank Group and IFAD Program Evaluation Document No. PAD59847_REV_1: Agricultural Enterprise Development Program II [ADP II], 2016). For example: The Chinese government financed the construction of a rice mill in Makeni City to increase local rice production capacity (Xinhua News Agency, 2016). The program aims to reduce post-harvest losses and increase the income of local farmers. China's participation in international agricultural trade agreements and initiatives has further strengthened its role as a key player in the development of global food policy, the World Trade Organization (WTO) and the Economic Cooperation Agreement with Africa. China places a strong emphasis on expanding policy dialogues and cooperative efforts on agricultural development with African countries. Within the context of the Forum on China-Africa Cooperation (FOCAC) which was established in 2013, China promotes comprehensive agricultural cooperation by upholding the values of sincerity, actual results, affinity, and good faith. The development of cooperation programs for agricultural modernization is accelerated by

the presence of platforms like the China-Africa Agricultural Cooperation Forum and the China-AU Agricultural Cooperation Committee[25]. Enhancing agricultural industrial chains is another significant area to which China contributes greatly. It supports the Common Africa Argo-Parks Program (CAAPs) and promotes agricultural demonstration centers that foster industries encompassing seed breeding, planting, processing, warehousing, and sales in different Sub-Saharan African countries.

China's collaboration extends to international organizations such as the Food and Agriculture Organization, World Food Programme, and International Fund for Agricultural Development. Partnerships with NGOs, financial institutions, and organizations like the Alliance for a Green Revolution in Africa and the African Development Bank highlight the country's critical role in global food and agriculture governance. China's comprehensive approach to agricultural development in Africa—through strategic policy alignment, industrial chain enhancement, technological cooperation, scientific innovation, trade facilitation, and food security efforts—demonstrates a robust commitment to transforming Africa's agricultural landscape. The ongoing collaboration with international entities underscores China's pivotal role in fostering sustainable agricultural development in Africa (Albert E., 2018)[26]. In its global drive for trade contributions, it also facilitates the trade of agro-products as a vital contribution. It enhances institutionalized cooperation on quarantine and inspection, improving the "green channel" for African agro-products entering China. Expos such as the China-Africa Economic and Trade Expo play a significant role in increasing agricultural exports from Africa to China. Cooperation on pilot free trade arrangements and building cross-border warehousing, logistics, and distribution centers streamline imports and exports, while contract farming strengthens direct cooperation between enterprises and farmers. Ensuring food security is a core objective of China's agricultural cooperation with Africa. Through agricultural demonstration centers and industrial parks, China supports localized grain production and establishes production bases and large-scale warehouses for major grains like hybrid rice, cassava, and soyabeans. Over the past few decades, China has experienced a significant transition from a predominantly agricultural economy to a commercial economy, with the role of agriculture in the rural country's gross domestic product (GDP) decreasing (World Bank, 2021). This change has many important factors, such as large-scale agriculture, mechanization, widespread use of irrigation and the use of modern agricultural technologies (H. Canton & FAO, 2021)[27].

However, in Sub-Saharan Africa, there is deeply rooted existing scepticism toward foreign cooperation which has manifested in people and continues to breed sentiments (Eleveld, E., & Pennink, B. 2021)[28] and a sense of resentment toward foreign investments (Moss, T., et al., 2004)[29]. Many people view these foreign corporations in Africa especially from economic giant nations as instruments of imperialism and exploitation of the African society, following centuries of colonial capitalism during which the African continent suffered the most. On the other hand, as Africa looks to benefit from globalization through its endowed natural resources which most countries lack the needed technology to explore, the continent is encouraged to embrace foreign cooperation as these bring indirect benefits of foreign investments, such as increased employment, the transfer of technology, and spillover effects on local firms (Markusen and Venables, 1997)[30]. However, the fear of imperialism continues to affect foreign collaboration, especially among some local inhabitants when these relationships are viewed as a predicator-prey relationship (Eleveld, E., & Pennink, B. 2021)[28].

V. Food Value Chain

The value chain simply describes the full range of activities that specific actors undertake to bring a product or good from its design and conception stage to its end use by the customer (Fanzo, J.C. et al., 2017)[31]. These constitute activities such as design, production, marketing and distribution. A food value chain is the full range of farms and other institutions including the government, private sector, and donor partners and their successive coordinated value-adding activities that produce particular raw agricultural materials and transform them into particular food products that are sold to final consumers at satisfactory and disposed of after use, in a manner that is profitable throughout society and has broad-based benefits that do not permanently deplete natural resources (Stevenson, J., & Vlek, P. (2018)[32]. A process where the government takes the central role of coordination, regulation and providing the needed environment while the private sector and donors are linked to increase the value along the food chain. Value addition to the food chain and its analysis have recently become one of the top research-focused areas in the economic side of the food value chain (Akyuz, Y. H. et al., 2023)[33]. World Bank identified that agriculture is still a vital tool for reducing poverty and promoting sustainable development. Nevertheless, market participants' roles (Deepak, P., & Laveena, S. 2018)[33] and other key steering wheels or participants continue to limit the food value of agriculture. The food value chain consists of a multitude of activities and from one activity to another, where value is added to the product at every stage up to its final form which normally begins with the

production, continues with the processing, storage or elaborating of the final product, and ending with the marketing and sale to the consumer or end-user which are referred to as the value additions. The propelling urbanization rate and increasing trajectory of the middle class in third-world countries make the local value chain linked to both domestic and regional markets increasingly valuable for smallholder farmers (Leão, R.E. et al., 2023)[8]. These agricultural value chain weaknesses, which leave smallholder farmers at the mercy of predators along the value chain, have been made clear by dramatic and inconsistent price controls on agricultural goods. To feed the 2.4 billion people who will inhabit Africa by the year 2050, transformational agriculture is needed; which means a system of agriculture that transcends from a heavy reliance on subsistence farming to one that is mechanized and where smallholder farmers engage in mechanized agriculture that is connected to markets at both the national and regional levels, where producers and the private sector can take advantage of economies of complementarity and economies of scale (Ba, M. N., 2016)[34].

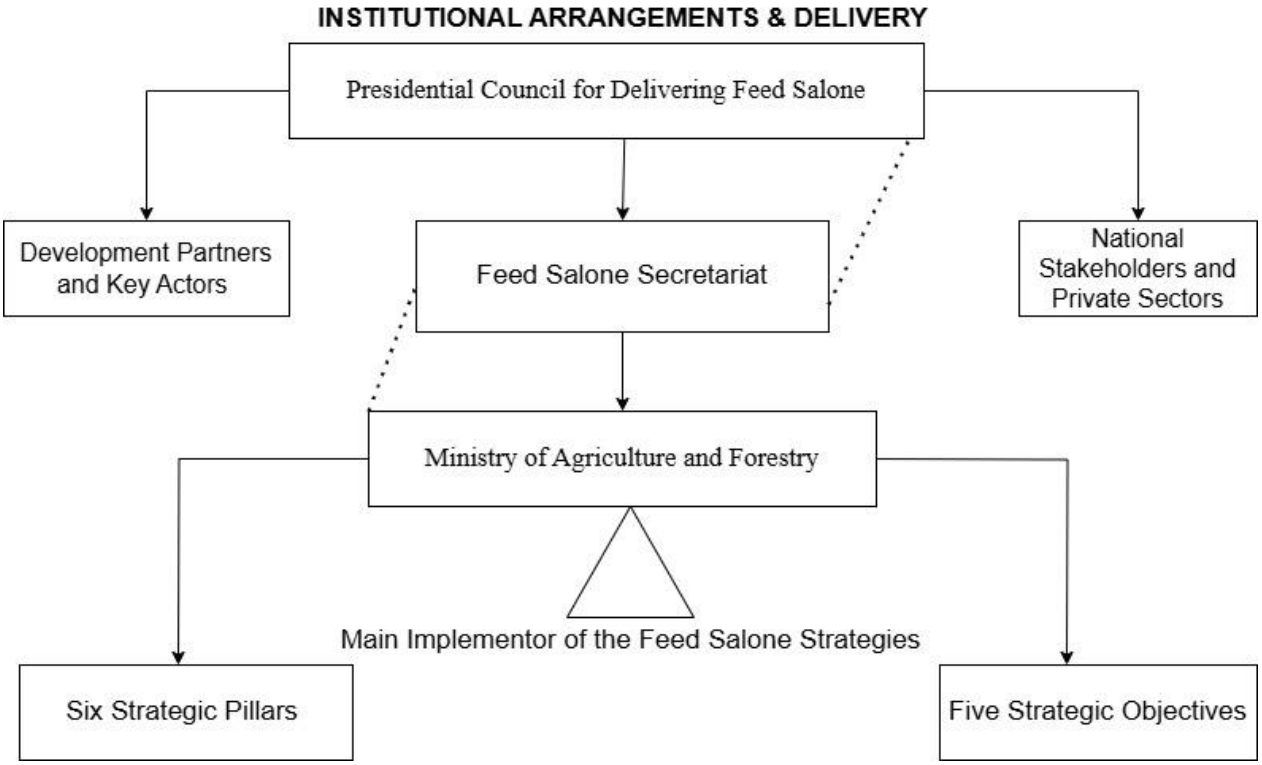
Value chain analysis in Sierra Leone has been carried out for cocoa, oil palm, cassava, vegetables (cabbage), rice, ginger, and poultry (focusing on eggs) and in all cases, very little value addition takes place, with the chains being limited, very short and often confined to only two or at best three stages along the chain. In a value chain process, for instance, where cassava is transformed into gari, allowing for commercialization across extended periods or distances without deterioration or significant waste. However, the value increase is only small due to a lack of sophisticated technologies. Post-harvest losses are high, estimated to be 40% on average, and significantly greater for crops such as vegetables, fruits, cassava, and sweet potatoes, as well as perishable seafood (NSADP, 2010). The Africa Agribusiness and Agro-Industries Development Initiative (3ADI) an initiative which was launched at a high-level conference on the Development of Agribusiness and Agro-Industries in Africa (HLCD-3A), in the Federal Capital of the Republic of Nigeria, Abuja on March 2010 brought about a wake-up call to the decades of neglect the agriculture sector has suffered from African governments. According to Ba, M. N. (2016)[34] there are four main ways in which the agro-processing of agricultural commodities increases food security and enhances the function of the Africa Agribusiness and Agro-Industries Development Initiative. These are; by lowering post-harvest losses, which the United Nations Development Organisation (UNDO) in 2011 predicts might reach 30% for cereals, 50% for roots and tubers, and up to 70% for fruits and vegetables; by prolonging the food's shelf life and improving accessibility to metropolitan areas where the majority of the people reside; by enhancing the value of goods, hence raising wages and generating jobs from the point of production to the point of consumption; and by creating suitable certification, traceability, and standardization programs, food quality and safety can be enhanced, leading to greater market accessibility. So, to ensure food security, sustainability, and the health of current and future generations, it is not only a choice but a strategic need to explore and harness the possibilities of food value addition in this period of rapid technological innovation and altering consumer tastes. Come discover the many facets of food value addition and its disruptive potential for influencing how our food systems develop in the future (Barbosa-Cánovas & Zhang, 2002 ;Marsden, 2012)[35]. Value-added producers ought to consider themselves as employees of a food company that prepares and distributes goods to consumers.

Areas of supply chains are however, witnessing an increase in the focus on trade, processing, marketing, and retailing. More manufacturing-like methods of producing food are replacing the conventional approach, requiring more coordination between farmers, processors, merchants, and other value chain participants. Additionally, as money rises, food consumption patterns are shifting. A growing number of farmers are attempting to diversify their production systems in response to the increased demand for high-value commodities such as fruits, vegetables, fisheries, livestock products, and edible oils. One way to increase efficiency in the agricultural industry has been proposed: organizing agriculture along the value-chain framework. In India, the creation of effective agricultural value chains has received more attention, and several creative and prosperous value chains have arisen. Although these new patterns seem to be aimed satisfying the needs of an increasingly affluent and expanding customer base, they have raised issues related to both supply and demand. Modern integrated value chains benefit producers by lowering costs and losses, improving food safety and quality, increasing value addition in the production process, and increasing sales (Kumar, A. et al., 2011) [36].

VI. Institutional Arrangement of the Feed Salone Project

The word “FEED SALONE” is taken from the liqua franca of the country, the Krio language, the most commonly spoken local language in the country. It literary means “Food sufficiency in the country without reliance on imported food products”. The "FEED SALONE" project, however, aims to boost rice production, poultry farming, and fisheries through an increase in government investment in agriculture by increasing its annual budget to hit a milestone. It strives towards mitigating potential negative impacts on food sufficiency while reducing food imports

to the barest minimum and maximizing exports cannot be unconnected to this maiden project of the president. The president just after launching the Feed Salone Initiative during his second term further announced its institutional arrangement stating very clearly that he is the chairperson of the named "President Council for Delivering Feed Salone" (Feed Salone Strategy, MAFS, 2022)[13]. This established council chaired by the president of the Republic of Sierra Leone is responsible to: provide strategic guidance and support to the Ministry of Agriculture and Food Security (MAFS), securing support and convening development and key actors, enlisting the commitment of vital national stakeholders both within and outside of the agriculture sector, to promote the development of critical value chains, to ensure that there is policy coherence to ensure an increase in the sector's productivity, to oversee and monitor agricultural service delivery by the Ministry of Agriculture and its related bodies and agencies. Whereas the Ministry of Agriculture and Forestry plays the role of the main implementor of this maiden initiative. However, this initiative also has an established secretariat which is responsible for providing administrative backstopping to the presidential council and the Ministry of Agriculture and Food Security (Feed Salone Strategy, MAFS, 2023: P 61)



Source: Authors'

Sketch of the Feed Salone institutional arrangement and delivery according to the Feed Salone Strategy details through the Ministry of Agriculture and Food Security (MAFS, 2022)[13]

The six (6) strategic pillars of the initiative through which the Ministry of Agriculture and Food Security would improve the functioning and efficiency of the value chain of priority crops, culminating in higher levels of productivity, increased export earnings, resilience to climate change, reduction in hunger and food insecurity, and creation of jobs are; 1) mechanization and irrigation; 2) seeds and inputs system; 3) aggregation, processing and marketing; 4) access to finance; 5) agricultural technology (AgTec) and climate-smart agriculture (CSA); 6) empowering women and youth.

The six strategic pillars of the Feed Salone Initiative
Source: Feed Salone Strategy (MAFS, 2022)[13]

The strategic objectives are at the heart of the Feed Salone Project which guides the efforts of the governments to provide food sufficiency over the next five years (2023-2028). These are; 1) reduction of reliance on imported staple foods and boost domestic production and increasing the production of other traditionally imported products; 2) boosting the earnings from agro-commodity exports to provide immunity to the country to withstand shocks and bolster foreign reserves, and excel in the global market. This work towards optimizing production techniques that ensure the achievement of higher yields, adding value to raw products, improving the efficiency of the supply chain, and ensuring that the products produced match global standards and be able to compete in the global market; 3) Creation of 35,000 jobs through the development of agro-industrialized, promoting 21st-century farming techniques, and nurturing the growth of agri-business among women and young people; 4) reducing hunger and malnutrition which involves holistic programmatic efforts to ensure the major food source, like portentous fish is not only available but also accessible and affordable to all; 5) building a climate resilience food system that can withstand the seasonal changes of the country. This initiative would build programmes that are geared towards protecting the future, such as investing in climate-smart agriculture practices, investing in resilient infrastructure, and bolstering the adaptive capacities of farmers.

The ecology of the land provides natural opportunities which has continued to make it possible for the country to enjoy a natural climatic environment of favourable rainfall ranging from 3,000 mm to 5,000 mm per year on the coast and 2,000 mm to 2,500 mm in inland (MAFS, 2022)[13]. The land is naturally endowed with fertile soils,

sunlight, and river basins that continue to build such an amazing climatic advantage cultivating rice (E. Graham, 2020)[9].

The Land Ecology for Rice Production in Sierra Leone

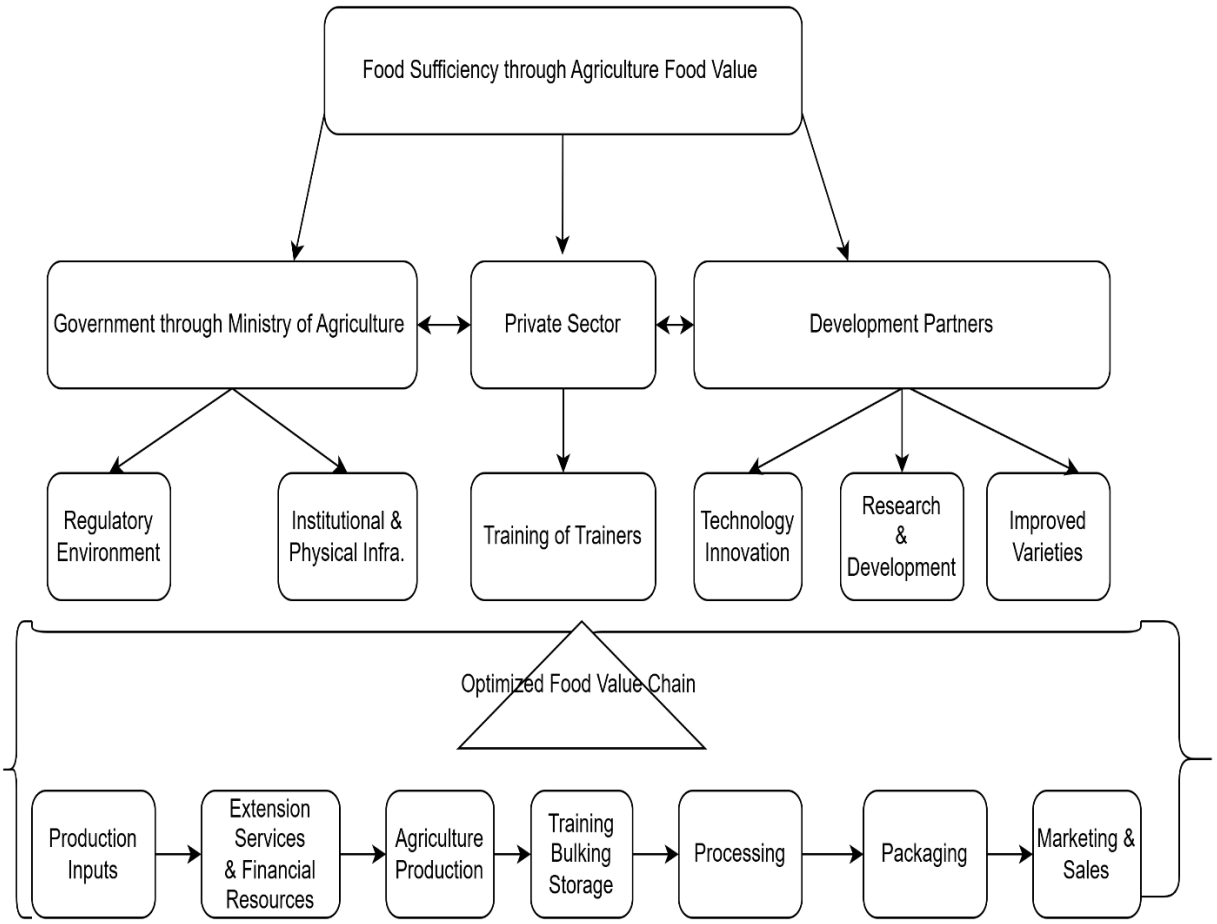
Rice Ecology	Appropriate size (hectares)	Average yield (mt/hectares)
Upland	200,000-250,000	1.2-1.2
Mangrove Swamp	50,000-80,000	2.5-3.0
Boliland/inland Valley	40,000-60,000	2.0-2.5
Riverine Grassland	20,000-30,000	1.8-2.2

Source: (MAFS, 2022)[13]

VII. Food Sufficiency and the Institutional Theory in the Feed Salone Project Perspective

Institutional theory is the concept of a deeper and more resilient aspect used in social sciences and organizational studies. It's considered the process by which structures, including general conceptions, norms, rules, organograms, and routines, become established as authoritative and substantive guiding principles for social behaviours. In organizational studies in modern society, it encompasses a substantial corpus of theoretical and empirical work that is united by a shared focus on social norms and shared expectations as key origins of organizational structures, behaviours, and outcomes (R. Greenwood, R.C. et al. 2019)[37], which is used to understand organizational dynamism and how they are influenced by their surrounding environments. The application of this theory in the real world, especially in major projects takes different trajectories in the institutional context, for instance, Biesenthal, C. et al., (2018)[38] state that understanding the institutional framing, underpinnings and logics of megaprojects can bring about the successful implementation of such multi-million dollar projects through the development of best practices for building social, organizational and political legitimacy that ensures the stability and security of pivotal role that such projects play in this interconnected world.

Using an institutional theory lens to ensure that the government achieves its maiden initiative to provide food for its growing population through the Feed Salone programme, with China's contributions, the authors have proposed a "Food Sufficiency through Agriculture Food Value Chain" framework that posed to bring various key players and functionaries to optimize and deliver on this initiative. This is taken and extended from the work of De Brauw, A., & Bulte, E. (2021)[39] on his research - *African Farmers, Value Chains and Agricultural Development* which the author named "schematic of an Agricultural Value Chain". In his work, he defined "value chain" as the range of goods and services necessary for an agricultural product to move from the farm to the final customer or consumer. However, he does not emphasize the involvement of other key players as our extension of his framework does capture key players referred to as the steering wheels along the line of optimizing the food value chain, which includes, the private sector, development or donor partners, and the role of the government as a regulator and provider of necessary institutions and physical infrastructure. The below diagram shows the interplay among the three (3) key players in the Feed Salone initiative; the government through the Ministry of Agriculture and Food Security, the private sector, and development or donor partners that have shown great support in the country's drive to achieving food sufficiency for its growing population. The authors have further designed the below framework as a project delivery model (PDM) (Davies, MacAulays and Brady, 2018)[40] which shows three key actors in this case serving as a road map to an optimized food value chain through the objectives of the Feed Salone Initiative

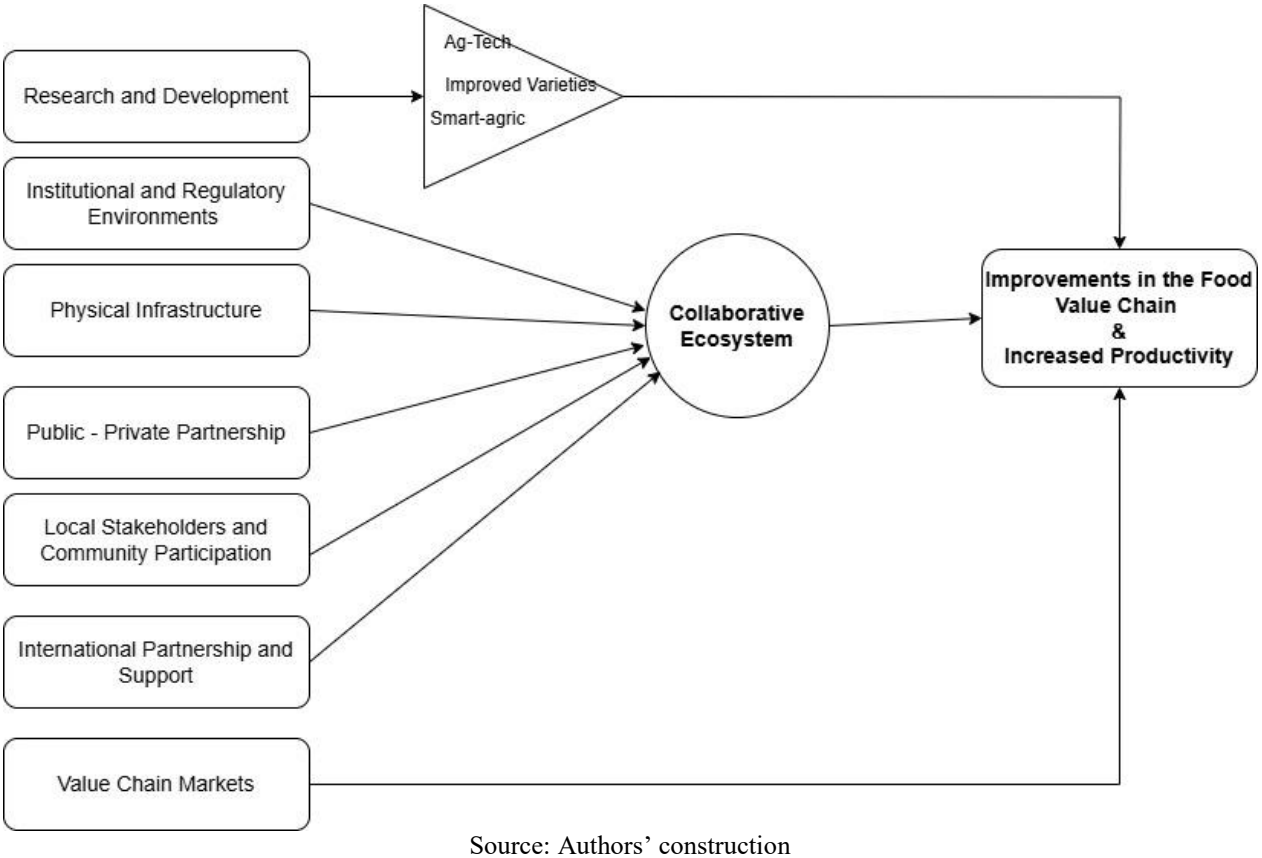


Source: Authors' construction

VIII. Research Framework

Most analysts would agree that the concept of the agriculture food value chain is a bit broader, and must not be limited to just what takes place from the production to the final consumer. It first of all needs to include an environment with the needed structures, policies and technologies that will now lead us to input provision, extension services, and finance for an improved production that carries the rudiments that take us to add the value needed on the products through several value-added processes and activities before finally reaching the final consumer. Multiple actors are connected along the value chain to provide the environment, produce the product, process, and deliver goods to final consumers through a sequence of activities.

De Brauw, A., & Bulte, E. (2021)[39] highlighted that agriculture value chain approaches are often used by donors seeking to help upgrade existing chains or to develop new ones which will focus on approaches to incorporate smallholders in chains or enable them to extract greater value from chains (usually by increasing productivity and quality or carrying out activities further along the chain) that help in supporting them and getting the best from their product or production, this is what he referred to as, "Inclusive value chains". Such value chains encompass the various stakeholders and other functionaries in a fully designed ecosystem that is collaborative for effective delivery. However, this research framework can be seen thus;



Source: Authors' construction

Research framework showing the path to a collaborative ecosystem that will ensure improvements in value chain processes and increased productivity.

8.1 Methodology

This research applies an in-depth exploratory case study approach to specific components of the ongoing "Feed Salone Initiative" that has Chinese involvement. The most common association between case study research and qualitative inquiry is its increasing importance as a useful method for examining challenging problems in practical or real-world contexts (Patnaik, S., & Pandey, S. C. 2019)[14], who believe that if a modern phenomenon is to be investigated, case research is thought to be relevant. This study makes use of associated ideas that pertain to this special research approach, which will concentrate on introducing rigour into the phenomenon being examined. Measures to establish the validity and reliability of the qualitative data will also be considered to determine the stability and quality of the data obtained.

The interview questions are drawn from a picture of the five key project objectives and other key measurement indicators for productivity and value chain. This project's objectives will give an insight into the project's targets through which measurement indicators are drawn. The semi-structured interviews used allows the interviewer to flexibly ask questions in an organized matter to collect the relevant data and insights on the interviewee's perceptions about the subject matter under the case study. This method of data collection will also delve into personal interviews using unstructured questionnaires, direct observation, and focus group discussions of key project participants or beneficiaries. Key stakeholders, like district agricultural officers (DAOs), field experts, extension workers, project donor partners, project leads at district levels, embassy officials, other appointees directly working in the Feed Salone programme, and other available archival records are also part of the data upon which this research analytical foundation is based. A general data analytic approach using descriptive statistics is applied.

These interviews consist of different themes, such as China's influences in the ongoing "Feed Salone Initiative", and its impact on the food value chain and productivity in the sector, how their influence in such a maiden national project is perceived by Sierra Leoneans with the overarching theme to investigates the impact of these contributions to Sierra Leone's agriculture productivity and value chain, while critically examining whether this is a historical success or a mishap. This will allow the researcher to accurately answer the open research question and proposed propositions which will further allow for a critical analysis of the project's impact on local communities,

analysis of its implementation effectiveness, mitigation strategies, and suggestions for improvements. This method is more likely to be accurate especially so that several different sources of information will create the needed synergy that would create an interaction between the researcher and the participants in trying to generate data, which is an indication of the researcher's level of connection to the participants and the knowledge of the case under review.

This research identifies paths that would contribute to sustainable agricultural development, increase productivity, create a more equitable value chain in Sierra Leone, and enhance food sufficiency in the country. However, careful monitoring, evaluation, and adherence to best practices are crucial to ensure the success of such maiden projects which duty bearers need to adhere to in other to avoid negative consequences.

Reporting on the Chinese involvement and impact in the "Feed Salone Initiative" would, however, require a clear presentation of the problem, and its rich description of context, setting, and phenomenon while not disconnecting it to the drawing of inferences from past theories, events and other studies or judgments in other to align conformity or non-conformity where applicable which will generally lead to the presentation of findings and final report of a robust research work that stand the test of scientific rigours.

IX. Field Data Analysis

Demographic information and descriptive analysis of the data

The questionnaire instrument from which the data that forms the primary body of this section is purposely divided into two: one that deals with the initiative's direct beneficiaries at the community level and the other one that deals with key project stakeholders, including District Agriculture Officers, Embassy officials of both Embassies, Field staff of Ministry of Agriculture, Extension staff, and Chinese field experts.

The non-availability of most of the Feed Salone Initiative's measurement data for productivity and improvements in the value chain due to the ongoing nature of the programme, for instance, period of sufficient households' food provision, value of crops produced per household, number of production hectares with improved practices, number of crop production facilities built and utilized, gaps between actual and potential yields, and harvested crop yields per hectare. This further supports the use of exploratory research and descriptive statistics to analyse the available information and draw inferences according to what is available on the ground. However, Biesenthal, C., et al., (2018)[38] posit that despite the support provided by the secondary data and expert testimonies in such research, first-hand empirical accounts of the project would provide an invaluable contribution. So, data from secondary sources and experts' opinions form a support base for the primary data that will form the major source to draw inferences from this project.

9.1 Presentation of Data and Discussion of Results

The researcher adopted both online and offline survey methods to collect data from the key stakeholders of the Feed-Salone project and its end beneficiaries. Seven hundred two (702) responses were recorded from the online Google survey questionnaire which was coded and transmitted into the SPSS software through comma-separated versions (csv) which form the basis of the descriptive analysis. However, the research assistant and the research team lead conducted face-to-face interviews and some focus group discussions in some of the operational districts of the projects. The respondents' details are analysed using descriptive statistics according to their knowledge of the Feed Salone Initiative and China's contributions to food productivity and value chain.

Presentation of Data

Demographic data of **702** participants for this research is presented in Table 1 below.

Characteristics of research questions	**Categories**	**Frequency**	**Percent (%)**	**Cumulative percent**
Sex: What is your gender?	Male	454	64.7	64.7
	Female	248	35.3	**100**
	Non-binary	0.00	0.00	0.00
	Transgender	0.00	0.00	0.00
	I prefer not to say	0.00	0.00	0.00
	Others	0.00	0.00	**0.00**
Age: What is your age bracket?	Below 25	6	0.9	0.9
	25-35	340	48.4	49.3
	36-45	304	43.3	49.8
	Above 45	52	7.4	**100.0**

Academic qualification: What is your academic qualification?	Illiterate (No education background)	259	36.9	36.9
	Certificate	257	36.6	73.5
	Diploma	123	17.5	91.0
	Bachelor's degree	63	9.0	**100.0**
	Master's degree	0.00	0.00	0.00
	PhD.	0.00	0.00	0.00
Length of service: How long have you worked in this organization?	Less than a year	41	5.8	5.8
	1-3 Years	189	26.9	32.8
	3-5 Years	472	67.2	**100.0**
	Above 5 Years	0.00	0.00	0.00
Work department: Which category do you belong to in the list provided below?	Farmer	513	73.1	73.1
	Community Stakeholder	91	13.0	86.0
	Agro-dealer/ Agric-service provider	41	5.8	91.9
	Marketer	57	8.1	**100.0**
Length of service: How long have you been working according to the above category to which you belong?	Less than 1 year	41	5.8	5.8
	1-3 years	189	26.9	32.8
	3-5 years	472	67.2	**100.0**
	Above 5 years	0.00	0.00	0.00

Authors' field data.

The information on respondents to the "Feed Salone" project's evaluation of China's contributions to Sierra Leone's agricultural productivity is included in the table above. 64.7% of responders are male and 91.7% are primarily between the ages of 25 and 45. 36.9% of people lack formal education, 36.6% have certificates, 17.5% have diplomas, and 9.0% have bachelor's degrees. The majority have worked for three to five years (67.2%), mostly as farmers (73.1%). According to the demographic data, the workforce is primarily male, relatively young, and a sizable percentage just has certificates as formal education. The duration of service suggests a steady involvement in the range of three to five years, implying a modest level of experience but perhaps a lack of long-term retention or the novelty of the activities. The fact that farmers make up the vast majority of respondents emphasizes the importance of grassroots agricultural initiatives.

This report offers a vital starting point for comprehending the background of China's contributions to the agricultural sector in Sierra Leone. The focus on younger, primarily male farmers with low levels of education implies that to have the greatest possible impact, initiatives should be customized for this group of people. Future programs could benefit from emphasizing educational advancement and long-term engagement to promote more sustainable development within the "FEED Salone project.

Awareness level of the Feed Salone initiative

After the extensive literature providing an in-depth insight into the main research drive, the research assesses the awareness level of 702 people including farmers, agro-dealers/agric-service providers, marketers, and community stakeholders to know their awareness around the Feed Salone Initiative. The results from the question "Are you aware of the Feed Salone Initiative?" show that 72% of the total respondents indicated that they are well aware of the project, 18.1% indicated that they are somewhat aware of the project, and only 9.7% are unaware. This means that many people involved in agriculture activities in the 14 agricultural districts, excluding Western Urban and Western Rural districts, around the country know the Feed Salone Initiative.

Further, 100% of the respondents know that China supports Sierra Leone in this maiden project and none of them was unaware of it. However, the extent of China's involvement in the ongoing Feed Salone Initiative was assessed with the leading question "How do you assess China's involvement in the Feed Salone Initiative?" with a Likert measuring scale ranging from very low, low, moderate, high and very high. See the frequency table below.

Measuring scale	Frequency	Percent (%)	Cumulative Percent
Very low			
Low	2	0.3	0.3
Moderate	151	21.5	21.8
High	549	78.2	100.0
Very high	0.00	0.00	0.00

Authors' field data.

As many people's perceptions about China's involvement in such projects are for expanding their political influence, this research shows that China's involvement and contributions to the Feed Salone project are for humanitarian assistance and a way of strengthening their bilateral ties with the West African nation. See the frequency table below

Measurement indicators	Frequency	Percent (%)	Cumulative Percent
Economic Gain	27	3.8	3.8
Political Influence	1	0.1	4.0
Humanitarian Aid	122	17.4	21.4
Strengthening Bilateral Cooperation	552	78.6	100.0

Authors' field data.

This maiden initiative has created a lot of job opportunities, especially self-employed jobs for agri-preneurs most of which have increased their acreage of land cultivated this year by over 40%. It is evident according to the 2015 Population and Housing Census that 43% of the population is self-employed and does not have other employees (Statistics Sierra Leone, 2017)[41]. Most of these employments are been created by the agriculture sector followed by small and medium-scale enterprises (SMEs). This research tries to determine the main employment created by the Feed Salone project to which the results, however, show that it provides 69.5% self-employed jobs, 29.8% contract jobs and only 0.7% permanent jobs with national social security and insurance trust (NASSIT). There are line officers in the project who are contracted by the government for a certain period while there are also a few staff members from line ministries who are on full employment and are being attached to the project. Overall, 488 out of the 702 participants are self-employed

Measurement scale	Frequency	Percent	Cumulative Percent
Contract	209	29.8	29.8
Full Employment with NASSIT	5	0.7	30.5
Self-employment	488	69.5	100.0

Authors' field data.

To provide an enabling environment for agriculture to thrive and to encourage farmers both large-scale and subsistence farmers, the government and the land-owning families have collaborated to ensure that existing land regulations are eased to ensure that land is utilised for agricultural purposes without too many procedures or restrictions.

Measuring scale	Frequency	Percent	Cumulative Percent
Strongly Disagree	37	5.3	5.3
Disagree	64	9.1	14.4
Neutral	89	12.7	27.1
Agree	129	18.4	45.4
Strongly Agree	383	54.6	100.0

Authors' field data.

The pieces of training provided by the Chinese experts have continued to bring about new and improved skills to both farmers and line officers in the agriculture sector. This research also finds that the government of Sierra Leone has, however, set up an effective mechanism for monitoring this maiden initiative through the establishment of joint government and community committees in the project operational areas. So, support with farm implements,

machinery, pieces of training, funds for community engagement and farmers' training and education have been some of the effective measures to increase productivity of rice, poultry and onions.

However, the research also finds that there is a drastic reduction in onion importation because in-country production of onions in a larger quantity has already begun within the first 6 months of the project. Farmers also show a propelling increase in rice cultivation through a high increase in the acreage of lands cultivated that surpasses the previous years' which is achieved through government support, farmers' cooperatives, and NGO or donor support. There has not been much evidence of an increase in rice output because of the non-availability of output data within the research timeframe, but however, there is evidence of an increase in the area cultivated. This is also evident for poultry production where there has not been much evidence to show because most varieties for instance, birds (chickens) it takes about 60-72 weeks from the period hatcheries sell chicks to farmers for raising to the time the birds/chickens are ready for slaughter. However, poultry farmers are optimistic about an increase in their production in the next year as a lot of improved breeds have under raised.

Responses from the survey on whether there has been an increase in land cultivated for production

Measurement scale	Frequency	Percent	Cumulative Percent
Below 20% increase	90	12.8	12.8
From 20-30% increase	125	17.8	30.6
From 30-40% increase	57	8.1	38.7
From 40-50%n increase	128	18.2	57.0
Above 50% increase	302	43.0	100.0

Authors' field data.

The contribution of the Chinese through expertise and machinery support for mechanised farming has helped boost the smart agriculture drive of the Feed Salone Initiative and increase land under cultivation for rice production, and poultry farming.

Outcomes

I. Comprehensive understanding of China's contributions to the "Feed Salone" project as an international development partner.
II. Gaining insights into the impact of China's investments on agricultural productivity and the food value chain and agriculture productivity.
III. Identification of best practices and areas for improvement in the food value chain and agriculture productivity through Chinese contributions to the West African nation's agriculture sector.
IV. A proposed framework sketch of the Feed Salone institutional arrangement and delivery according to the Feed Salone Strategy details through the Ministry of Agriculture and Food Security (MAFS, 2022)[13]
V. The authors further designed a proposed project delivery model (PDM) (Davies, MacAulays and Brady, 2018)[40] which shows the multiple or three key actors in this case (government through the Ministry of Agriculture, the private sector, and development or donor partners) serving as a road map to an optimized food value chain through the objectives of the Feed Salone Initiative.
VI. A research framework showing the path to a collaborative ecosystem that will ensure improvements in value chain processes and increased productivity which encompass the various stakeholders and other functionaries in a fully designed ecosystem that is collaborative for effective delivery.

As disruptions at different stages of the food value chain continue to pose significant threats to food security, (MAFS, 2022)[13], this has led to a decline in the supply of essential food commodities and a hike in the prices of the available ones. The initiative which aims to address three key essential commodity issues in the next five years, rice, poultry, and onions, to which this study assesses the impact of China's contribution would implore several performance measurement indicators associated with food value chain and agriculture food productivity. Diskin (1999)[42] detailed that a lot of data have come out in the literature that claims that farmers' estimates of outputs split by direct measurements of planted areas are the best approach to estimating cereal crop yields in most circumstances. However, despite this method's seeming appropriateness in this context, it would, however, still not be applicable in this circumstance because this maiden five-year initiative is still within its first year of implementation and most data

are not readily available. So, out of the four main areas of target for value chain analysis identified by Akyuz, Y.H. et al. (2023)[33], which are institutional/functional, economic/financial, social, and environmental, this research focuses on the institutional/functional, and social analysis of the Feed Salone project. The research team is very optimistic that, due to the limited information available and the ongoing nature of the program, these two areas will give an insight into the project's value chain analysis, agriculture productivity, and China's contributions. On the other hand, since agriculture productivity is linked with food security, rural livelihood, and poverty alleviation (M. Lavlu, 2012)[43], measurement indicators on land used or cultivated, the right to utilize land, access to credit facilities, access to experts' services, and the use of improved varieties, insecticides, and pesticides are explored. China's contributions to the Feed Salone initiative are measured using key research questions relating to their support since the intervention of the project.

9.2 Conclusion

Food sustainability has become the integral priority of most economies around the world and a means of stabilizing the economy. Data gathered from 702 important stakeholders and end recipients served as the basis for the analysis. The responders are primarily young males (64.7%) between the ages of 25 and 45 (91.7%), according to the demographic statistics. Just 9.0% of the respondents had a bachelor's degree. A sizable chunk of the population (36.9%) lacks formal education, which is also a great impediment to agricultural growth and development. 73.1% of the participants are farmers but less that this percentage (67.2%) have been in this sector for a little over 3-5 years which means just a few of the farmers have stayed for over 3 years in the sector. Most of them are new entrants.

According to the findings, 72% of the respondents were aware of the Feed Salone Initiative, and 100% of them acknowledged China's contribution. Most people have a good impression of China's involvement: 78.6% see it as a way to improve bilateral relations, while 17.4% see it as humanitarian aid. The project has created a substantial number of jobs, mostly self-employment (69.5%), and it has encouraged more agricultural activity as seen by the 43.0% increase in the amount of land cultivated. Increasing agricultural outputs has been made possible by the government's cooperation with land-owning families to relax land rules as well as the efficient training and assistance given by Chinese specialists. Due to the increased capacity and resources made available by the program, there is hope for future gains even though there is little data on output increases, especially in the production of rice and chicken during the initial phase of the project because of ongoing production awaiting outputs. The expats human resources have also brought about new skills, innovation, and solutions to skills gaps in the agriculture sector in the country.

9.3 Recommendations

Expansion of agriculture educational/training opportunities to increase innovation which can be done by funding agricultural education and training programs geared toward the industry's primarily youthful, male workforce is essential. This is consistent with research showing that education has a major impact on agricultural productivity (Otsuka & Larson, 2016)[44]. This is also not disconnected from a zest for strengthening long-term engagement to retain those talents. Talent retention and sustained growth can be ensured by concentrating on long-term professional development and career progression initiatives. Human capital must be continuously invested in sustainable agriculture as Pretty et al., (2018)[45] stated.

Further, improving data collection and monitoring activities and providing robust systems for monitoring and evaluating outputs would help ascertain the effectiveness and resource utilization and optimization of the project. Effective monitoring systems and paying more attention to the country's specific constraints and opportunities are critical for the success of agricultural projects (Johnson, R. A., et al., :2022. de Graaf, J., et al., 2011)[5,46]. However, it's imperative to have market facilities to ensure the completion of the agriculture value chain for the outputs or products to reach consumers/customers as and when needed. So, improving infrastructure, reducing trade barriers, and providing market information can enhance the economic viability of agricultural activities. As stated by (Barrett, C. 2020)[47] market access is a key factor in the success of farming enterprises.

Government could have focused on some districts as a pilot stage of the project and later expand to other parts of the country. This could have created a better environment for meagre resource concentration and a learning stage for project expansion to other districts.

9.4 Some Limitations and delimitation of the paper

At the point of writing this paper, the "Feed Salone Initiative" project is in its first year of implementation, and it's clear that it has not received enough literature from scholars. So, one of the limitations of this research study will be the limited literature available in the academic community to beef up our work. The paper shows a snapshot of the project through an exploratory research journey.

Furthermore, some of our targeted respondents did not want to share some key project information with us, especially those that formed a critical part of the project inception stage.

However, the limited funding and time available for this research work can also limit our use of research assistants on the ground who can help in providing more factual details on primary data and other ongoing activities that could have been of great help in providing more insights to our research.

Nevertheless, we perform a literature analysis despite the paucity of available material by synthesizing and critically analysing the body of existing knowledge, outlining any gaps, and suggesting directions for further investigation into this new government initiative in a broader context. This is inextricably linked to one of the justifications for taking into account the exploratory qualitative research approach which can offer comprehensive insights and add critical viewpoints to the case study.

Furthermore, the principal researcher was born in the case study country and has interacted with most of the key project stakeholders, like district agricultural officers, agriculture youth champions, and many more before departing to China. So, this familiarity was leveraged to access information from key respondents. The Chinese Embassy in Sierra Leone is used as a channel for inputs from one of our targeted respondents, the Chinese agriculture experts in the country.

The principal researcher also went to most districts to obtain first-hand information about the project. The research team's selected assistants residing in the case study districts also played a critical role in providing information that greatly contributed to getting a report that truly represented the true objectives of this research.

Authors' additional notes:

Data availability for more internal and external checks: According to the authors, the data about the research findings are available and will be supplied at any moment by the corresponding author if necessary.

Conflict of interest: During this research, the authors declare no conflicts of interest.

Ethical approval: This study complies with the ethical guidelines established by the institutional research committee for all research procedures involving human subjects.

Informed consent: Before any data was taken from them, each participant in this study expressed their consent.

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APPENDICES

SECTION A

Questionnaire – PART ONE (1) - District Agriculture Officers, Embassy officials of both Embassies, Field staff of Ministry of Agriculture, extension workers, and Chinese field experts

Hello! We are a team of researchers from the Centre for West African Studies (CWAS) of University of Electronic Science and Technology of China (UESTC). We are doing a survey on the "Assessment of China's contributions to Sierra Leone's agriculture productivity and value chain: a mishap or historical success in the case of the "FEED SALONE" government priority project?"

NB: Please know that this survey information will be used for academic purposes only.

Please give us the correct response according to you, or fill in your opinion in the blanks as provided as accurate as possible to avoid a biased result from this research.

1. Are you aware of Feed Salone Initiative

Yes ☐ No ☐

2. Which category of staff do you belongs to?

- ☐ Public servant
- ☐ Civil servant
- ☐ Expert
- ☐ Not a staff (please skip question 3 of this section)

3. Which grade of staff do you belong to in your institution?

- ☐ Political appointee (public servant)
- ☐ Senior staff
- ☐ Senior Support Staff
- ☐ Extension staff
- ☐ Administrative Assistants
- ☐ Clerical staff, securities, and drivers
- ☐ Office Assistants, Cleaners and Generator attendants
- ☐ Others; please specify

4. Please indicate your highest level of education.

☐ Certificate ☐ Diploma Degree ☐ Master's ☐ PhD.

5. For how long have you worked in this institution?

☐ Less than a year ☐ 1-3 years ☐ 3-5 years ☐ Above 5 years

6. Are you aware of any support by China to the Feed Salone Initiative in Sierra Leone?

Yes ☐ No ☐

7. How are they supporting the Feed Salone initiative?

……
……

8. What support is China currently providing to the Feed Salone initiative?
…….
……
9. Please specify the nature of China's involvement in the "FEED SALONE" initiative in terms of funding, technology transfer, skills training, infrastructure development, etc.
…….
…….
10. What synergy exist between the Ministry of Agriculture and Chinese expats in the agriculture food value chain?
…….
……
11. What impact would this synergy create in the Food Value Chain in the ongoing Feed Salone project?
…….
……
12. What would be the possible setbacks to the Food Value Chain Optimization even with Chinese involvement?
……
……
13. What are the practical implications of this synergy?
……
……
14. What opportunities exist for enhancing the positive impact of Chinese contributions to the agricultural sector in Sierra Leone?

- ☐ Land Availability
- ☐ Favourable land ecology for production
- ☐ Available Market
- ☐ Community Involvement
- ☐ Political Will
- ☐ Other (please specify)

15. What are the existing mechanisms for monitoring the Feed Salone Project?
…….
……
16. To what extent has existing land use policies and other land regulations being modified to accommodate the project plans and meeting the key project objectives?

☐ To a greater extent ☐ To a fair extent ☐ To a lower extent ☐ Not at all

17. How would you rate the overall effectiveness of the current mechanisms for monitoring Chinese contributions to the Feed Salone project?

- ☐ Highly Effective
- ☐ Moderately Effective
- ☐ Ineffective
- ☐ Not certain

18. Are there any additional comments or insights you would like to share regarding Chinese involvement in the agricultural sector in Sierra Leone?

Thank you for your participation!

Questionnaire – Part Two (2) – **Local people and other key project beneficiaries and stakeholders in the operational districts**

Hello! We are a team of researchers from the Centre for West African Studies (CWAS) of University of Electronic Science and Technology of China (UESTC). We are doing a survey on the "Assessment of China's contributions to Sierra Leone's agriculture productivity and value chain: a mishap or historical success in the case of the "FEED SALONE" government priority project?"

NB: Please know that this survey information will be used for academic purposes only.

Please give us the correct response according to you, or fill in your opinion in the blanks as provided as accurate as possible to avoid a biased result from this research.

For quality reasons, please kindly skip any question that is not applicable to your situation

1. Are you aware of Feed Salone Initiative

Yes ☐ No ☐

2. What is your awareness level of the "FEED SALONE" initiative?

- ☐ Highly aware
- ☐ Somewhat Aware

3. Which category do you belong to in the list provided below?

- ☐ Farmer
- ☐ Community stakeholder
- ☐ Agro-dealer or agric-service provider
- ☐ Marketer
- ☐ Others: Please specify

4. Please indicate your highest level of education.

☐ Certificate ☐ Diploma Degree ☐ Master's ☐ PhD.

5. For how long have you worked in this organization?

☐ Less than a year ☐ 1-3 years ☐ 3-5 years ☐ Above 5 years

6. Are you aware of any support by China to the Feed Salone Initiative?

Yes ☐ No ☐

7. How would you rate the extent of China's involvement in the "FEED SALONE" initiative?

- ☐ Very high
- ☐ High
- ☐ Moderate
- ☐ Low
- ☐ Very Low

8. What are the primary motivations driving China's involvement in the "FEED SALONE" initiative?

- ☐ Economic Gain
- ☐ Political Influence
- ☐ Humanitarian Aid
- ☐ Strengthen bilateral cooperation
- ☐ Others (please specify)

9. How would you characterize the current state of agricultural productivity in Sierra Leone?

- ☐ Very high
- ☐ High
- ☐ Moderate
- ☐ Low
- ☐ Very Low

10. Do you perceive any noticeable impact of China's support to agricultural productivity in Sierra Leone?

Yes ☐ No ☐

11. To what extent do you believe China's contributions has influenced the local agricultural value chain and productivity in Sierra Leone?

☐ To a greater extent ☐ To a fair extent ☐ To a lower extent ☐ Not at all

12. China's involvement in the Feed Salone programme has created employment opportunities for the youth, women and other disadvantaged groups in the agricultural districts in the country?

- ☐ Significantly
- ☐ Moderately
- ☐ Minimally
- ☐ Not at all

13. Please specify the areas within the agricultural value chain where you perceive China has contributed to the most

- ☐ Production inputs
- ☐ Processing
- ☐ Packaging
- ☐ Distribution

☐ Marketing
☐ Sales
☐ Others (Please specify) …….

14. How has China's contributions in the agricultural value chain impacted the competitiveness of local agricultural products in domestic and international markets?

☐ Improved Competitiveness through experts training and machinery supports
☐ Decreased Competitiveness
☐ No Significant Change
☐ Unsure

15. To what extent has the Feed Salone programme created employment opportunities alone the value chain processes?

☐ To a greater extent ☐ To a fair extent ☐ To a lower extent ☐ Not at all

16 Which main employment type does Feed Salone programme offers?

☐ Contract ☐ Full employment with NASSIT ☐ Self-employment ☐ Not at all

17 The coordinators of the Feed Salone programme ensure there is no discrimination along the project activities

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

18 Government has created enough social support programmes along the value chain that support the implementation of the Feed Salone project

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

19 What do you perceive as the main challenge hindering China's contributions to agricultural sector in Sierra Leone?

☐ Lack of Local Participation
☐ Environmental Concerns
☐ Governance Issues
☐ Security
☐ Access to Land
☐ Lack of Access to Market
☐ Infrastructure Limitations
☐ Other (please specify)

20 The Feed Salone programme has made it easier to gain access to land for cultivation purposes without too much protocols as before

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

21 What opportunities exist that enhance and maximizes China's contributions to the agriculture sector in Sierra Leone?

☐ Land Availability
☐ Favourable land ecology for production
☐ Available Market
☐ Community Involvement
☐ Political Will
☐ Other (please specify)

22 The experts from China are providing trainings that brings about new and improved skills and techniques to fill in the existing skills and knowledge gaps in agriculture productivity and value chain

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

23 What are the existing mechanisms for monitoring the Feed Salone Project?

……
……

24 Has measures been put in place to increase production of rice, poultry, and Onions in Siera Leone through the Feed Salone Project

☐ Yes ☐

25 Have you received any support from government in the past six months to enhance your agriculture activities?

☐ Yes ☐

26 To what extent has the support received from government improve your productivity

☐ To a greater extent ☐ To a fair extent ☐ To a lower extent ☐ Not at all

27 To what extent has the importation of Rice reduced after the intervention of Feed Salone project?

☐ To a greater extent ☐ To a fair extent ☐ To a lower extent ☐ Not at all

28 To what extent has the importation of Poultry reduced after the intervention of the Feed Salone project?
☐ To a greater extent ☐ To a fair extent ☐ To a lower extent ☐ Not at all

29 To what extent has the importation of Onion reduced after the intervention of the Feed Salone project?
☐ To a greater extent ☐ To a fair extent ☐ To a lower extent ☐ Not at all

30 To what extent has existing land use policies and other land regulations being modified to accommodate the project plans and meeting the key project objectives?

☐ To a greater extent ☐ To a fair extent ☐ To a lower extent ☐ Not at all

31 Are you using any fertilizer and or insecticides in your farm to increase productivity and yields?
☐ Yes ☐ (Skip 29)

32 How did you get the fertilizer, insecticides or pesticides used in your farm?
☐ Purchased
☐ NGO support
☐ Government support
☐ Farmers' cooperative
☐ Donor partners
☐ Others (please specify)

33 There is an increase in the acreage of land I cultivated this year
☐ Significantly
☐ Moderately
☐ Minimally
☐ Not at all (skip 31)

34 What is the reason for such an increase this year?
☐ NGO support
☐ Government support
☐ Farmers' cooperative
☐ Donor partners
☐ Personal drive
☐ Others: please specify

35 Has China's contribution to the Feed Salone initiative helped boost the Smart farming system?
☐ Very significant
☐ Moderately
☐ Minimally
☐ Not at all

36 Because I have been involved in major decision-making around the Feed Salone programme, this has increased my commitment to the success of this initiative
☐ Significantly
☐ Moderately
☐ Minimally
☐ Not at all

37 How would you rate the effectiveness of the current mechanisms for implementing the Feed Salone project?
☐ Highly Effective
☐ Moderately Effective
☐ Ineffective

☐ Not Sure

38 How would you rate the current mechanisms for monitoring the implementation process of the Feed Salone project?

☐ Highly effective
☐ Moderately effective
☐ Ineffective
☐ Not Sure

39 How would you rate the overall effectiveness of China's contributions to the Feed Salone project?

☐ Very significant
☐ Moderately significant
☐ Minimally significant
☐ Not significant at all

40 Are there any additional comments or insights you would like to share regarding Chinese involvement in the agricultural sector in Sierra Leone?

Thank you for your participation!