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Case study of agriculture and development projects on Sri lanka army's contribution to achieve food security

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Abstract

This research explores the role of the Sri Lanka Army's in enhancing food security within the country. Food security is a critical concern in Sri Lanka, influenced by factors such as climate change, agricultural practices, and societal dynamics. Leveraging their capabilities and resources, the Sri Lanka Army can significantly contribute to addressing these challenges. This study examines the potential contributions of the army in terms of food production, infrastructure development, technology adoption, and capacity building and development. Research design is a mixed-methods approach were used by a structured questionnaire targeting various stakeholders, including pertinent Sri Lanka Army personnel and conducted in-depth interviews with key stakeholders. The analysis underscores the importance of collaboration, knowledge transfer, and sustainable practices in achieving lasting food security. Through a comprehensive approach and collaborative efforts involving various stakeholders, including government bodies, local communities, and agricultural organizations, a more resilient and secure food system can be envisioned for Sri Lanka.

Keywords: Sri Lanka; Army; Food Security; Agriculture

Introduction

According to the 1996 World Food Summit, "At all times, all people should have physical, social, and economic access to enough safe, nutritious food that satisfies their dietary needs and food preferences for an active and healthy life" (Guttal, 2021). The concept of food security encompasses both the availability and accessibility of food. Food security is essential for reducing hunger, strengthening economic development, improving social welfare, ensuring food price stability, and mitigating climate change's impact on food production. Developing countries must prioritize food security to improve the well-being of their populations and achieve sustainable development. Developing countries often face a high prevalence of hunger and malnutrition due to inadequate access to food. "Therefore, food security is utmost important to any country in the world and especially for developing countries like Sri Lanka. According to the United Nations, around 690 million people globally are undernourished, with the majority living in developing countries" (Mohajan, 2022).

"Food security is a critical concern in the contemporary world, holding enormous significance owing to its far-reaching insinuations on individuals, publics, and nations. In a time marked by globalization, changing climatic patterns, population growth, and economic disparities, ensuring food security has become an urgent priority" (Fouilleux and Bricas, 2019).

Achieving food security involves an inclusive approach that encompasses maintainable agricultural practices, impartial food spreading arrangements, social protection nets, and addressing environmental and economic challenges. Agriculture is a significant contributor to the economy in many developing countries, providing employment, livelihood, and income opportunities (Weerasekara *et al.* 2021; Bandula and Nath, 2020). Food security measures can enhance agricultural productivity, ensuring the availability of food resources, increasing exports, and improving the standard of living for individuals and communities.

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Sri Lanka is an agriculture-based country. Thirty present of our population is employed in the agricultural sector and agriculture contributes to seven percent to the national annual Gross Domestic Product (GDP) and the contribution of the livestock sector is 0.9 percent (Kariyawasam *et al.* 2021). The staple food of Sri Lanka being rice cultivation of paddy remains the main food crop of the country. Further vegetable and fruits are also cultivated for consumption of and export.

The Green Agriculture Steering Committee of the Sri Lanka Army (GASC) was established by the Sri Lanka Army to support and promote the island and food security program by cultivating more than 1,500 hectares of unused or abandoned public land across the country (Geretharan *et al.* 2019). This strategy is of urgent national importance. The Commander of the Army, designated as the Head of the overall management of the GASC, will lead the emergency project, which is expected to start in early July, 2023 as a support mechanism for the government and the agricultural campaign. Chief of Staff of the Sri Lanka Army was assigned to oversee the entire project. The Sri Lanka Army has made significant contributions towards achieving food security in the country (Effler *et al.* 2020). the Sri Lanka Army's contributions in agriculture, land development, rural infrastructure, disaster relief, and food distribution have played a significant role in achieving food security in the country. Their efforts have helped to increase agricultural productivity, improve access to farmland, and ensure the availability of food during emergencies and challenging times.

The growth of the nation's agriculture industry has been greatly aided by the Pakistan Army. In order to promote agriculture in Pakistan and strengthen the economy of the nation, the army has taken a proactive role in agricultural research, development, and extension activities (Yaseen *et al.* 2022). The Army Welfare Trust (AWT) Farms were established, which is one of the Pakistan Army's most important contributions to agriculture (Staniland *et al.* 2020). These farms, which total more than 50,000 acres, are dispersed across the nation in places like Punjab, Sindh, and Khyber Pakhtunkhwa. Wheat, rice, sugarcane, cotton, and vegetables are among the many crops grown at the AWT Farms (Aftab and Ali, 2023). The Indian Army has been involved in the agricultural sector in various ways over the years. One of the most significant initiatives is the Indian Army's "Operation Sad99havana," which aims to provide assistance and support to the rural communities in various parts of the country (Galvin, 2021). Under this initiative, the Indian Army has launched various programs to help farmers improve their productivity, including providing seeds, fertilizers, and other essential agricultural inputs. To teach farmers about cutting-edge agricultural techniques like crop rotation, soil conservation, and water management, the Army has also set up agricultural training facilities (Alvi *et al.* 2021).

Following the national policy of His Excellency the President of Sri Lanka, "Vistas of Prosperity and splendor," the Sri Lanka Army manages several Army Farms and agro projects across the island with the goal of building a prosperous nation. Transforming Troops in to Execute Nation-Building Tasks, Maiden Corps of Agriculture and Livestock raised in the Army on January 2021 at Karandeniya and School of Agriculture and Livestock Sri Lanka (Williams *et al.* 2023). The locations of farming are Kilinochchi, 1 SLACAL; Nochchiyagama, 2(V) SLACAL; Karandeniya, 3(V) SLACAL; Kandakadu, 4(V) SLACAL; Manikfarm, 5(V) SLACAL - Jaffna and 6 SLACAL - Kilinochchi to deployed agriculture purpose (Fig. 1). The Directorate of Agriculture and livestock plays a vital role in the national economy by promoting agricultural growth, ensuring food security, creating employment, boosting agricultural exports, and fostering rural development. Its efforts align with the government's objectives to achieve sustainable economic development and improve the livelihoods of the people (Jayatilaka and Amirthalingam, 2023)
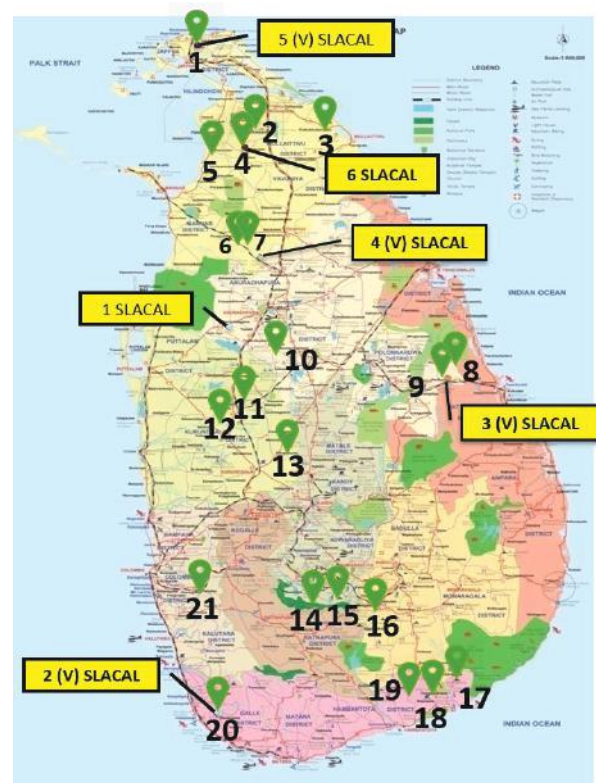

Fig. 1. Deployment of Army Farms

The main objective of the research is to comprehensively investigate the role and impact of the Sri Lanka Army in

enhancing food security and promoting sustainable agriculture within Sri Lanka. This involves understanding the array of contributions made by the army, evaluating their effectiveness, and identifying opportunities for improvement. The research aims to provide insights into how the Sri Lanka Army can effectively support and contribute to a more secure and resilient food system in the country.

Materials and methods

Research design

Designing a research study on the Sri Lanka Army's contribution to food security involves careful planning and structuring to effectively investigate and understand the various dimensions of this topic. Thus, mixed-methods approach which is used for this study. Develop a structured questionnaire targeting various stakeholders, including pertinent Sri Lanka Army personnel. Further, included a questions to measure perceptions of the Sri Lanka Army's involvement in agriculture and food security. Conduct in-depth interviews with key stakeholders, including Sri Lanka Army officers and agricultural experts, and community leaders.

Sampling strategy

Stratify the sample based on geographical regions within Sri Lanka, ensuring representation from 21 Army agriculture

Fig. 2. Sri Lanka's Climatic Zones 1

farms belong to Sri Lanka (Fig. 1). Out of 21 Army farms which are functioning by the SL Army 6 Army farms are selected for the research purpose based on the different climatic zones as samples based on the Fig. 2. Three climatic zones namely Wet zone, Arid zone and Dry zone. Kohilawagurawaththa and Dayagama farms are selected from the Wet zone as the sample and Andiyanpulinkulam and Ridiyagama farms are taken as the samples from the Arid zone while data collected from Maho and Kndakadu farms representing the Dry zone. Selected a proportionate sample from each stratum to reflect the regional distribution of the Sri Lanka Army's involvement (Table 1).

Population

The population of the study was considered as the Sri Lankan military personnel who were involved in agriculture and animal livestock activities and Sri Lanka Army has deployed its units around the country focusing the agriculture.

Data collection

The study was conducted using both primary and secondary data. For a research study on the Sri Lanka Army's contribution to food security, employing various methods of data collection is essential to gather comprehensive and reliable information. Following aspects indicated the several effective methods of data collection that were used in this context: Surveys Design and distribute structured questionnaires to relevant stakeholders, including Sri Lanka Army personnel farmers which include questions related to the Sri Lanka Army's involvement in agricultural projects and its impact on food security. Interviews Conduct one-on-one interviews with key informants, such as Sri Lanka Army officers and agricultural experts, and community leaders. Used structured interview guides to ensure consistency and focus on key research areas. Field Visits and Observations Visited agricultural project sites where the Sri Lanka Army is actively involved. Observe their activities, interactions with farmers and communities, and the implementation of food security initiatives on the ground.

Data analysis - quantitative data analysis

All the collected data will be analyzed meticulously to derive the result of this research. Analyzing the data collected in the research on the Sri Lanka Army's contribution to food security involves processing, interpreting, and deriving meaningful insights from the gathered information. The data analysis process helped to answer research questions and draw conclusions. The method of data analysis are as follows: Here are several effective methods for data analysis: Conducted Quantitative data analysis through the SPSS and

Table I. Details of Army farms deployed in around the Country

Sl. No.	Army Farms	LOC	Land Extent (Ac)	Utilized Land area (Ac)	Type of yields
(A)	(B)	(C)	(D)	(E)	(F)
1	Kankesanthurai	Jaffna	500	27	Chili, Vegetables, Coconut, Banana, Maize
2	Iranamadu	Kilinochchi	50	19.4	Vegetables, Mango, Green gram, Cowpea
3	Venavil	Mulaitivu	6	2.5	Fruit, Chili
4	Koddakaddeyarakulam	Kilinochchi	20	20	Chili
5	Wellamkulam	Mannar	100	122.5	Mango, Coconut, Cashew, Vegetables, Maize, Jack fruit, Banana, OFC, Cattle Mgt, Coffee, Chili
6	Andiyapuliyankulam	Vavuniya	118	133.25	Vegetables, Mango, Coconut, Maize, Chili, Turmeric, OFC
7	Menikfarm	Vavuniya	223	202	Vegetables, Mango, Fruits, OFC, Coconut, Maize, Chili, Black gram, Sesame
8	Galkanda	Welikanda	20	16	Paddy, Vegetables, Fruit, Coconut, Maize, Layer Mgt
9	Kandakadu	Welikanda	3003	1250	Paddy, Maize, Vegetables, Fruits, Coconut, Mango, Chili project, OFC, Orange, Tamarind, Grass (Co 3, Co 4) Cattle/Buffalo Mgt, MRE Factory, Sterilized Bottled Milk, Ornamental fish, Goat Mgt, Compost project
10	Niraviya	Thambuththegama	150	62.75	Vegetables, OFC, Turmeric, Mango, Maize, Sesame, Broiler Mgt
11	Maho	Kurunegala	15	10	Vegetable, Coconut, Mango
12	Balalla	Maho	8	9	Vegetables, Fruits, Coconut, Lemon, Banana, Layer Mgt
13	Pangolla	Kurunegala	32	36.5	Coconut, Maize, Chili, Vegetables
14	Menikpalama	Nuwara Eliya	58	5	Potato, Carrot and Cabbage
15	Dayagama	Nuwara Eliya	28	6	Carrot, Cabbage
16	Diyathalawa	Diyathalawa	4	3.5	Vegetables, Fruits, Protected house (Bell pepper)
17	Yala Palatupana	Thissamaharama	8.4	8	Vegetables, Mango, Aloe vera, Coconut, Watermelon, Lemon, OFC, Salt project
18	Weeravila	Hambantota	20	4	Vegetable, Banana, Ground nuts
19	Ridiyagama	Hambantota	120	120	Paddy, Maize
20	Kohilawagurawatta	Ambalangoda	28	29	Paddy, Vegetables, Turmeric, Coconut, Cinnamon, Tea, Cattle Mgt
21	Agriculture Project Sri Jayawardhanapura	Colombo	8.5	10	Paddy, Vegetables
	TOTAL		**4519.9**	**2096.4**	

used Descriptive Statistics and Frequency Analysis. Further, use correlation models to understand the relationship between variables, particularly examining the influence of the Sri Lanka Army's involvement on food security indicators. Furthermore, calculated correlation coefficients to identify and measure the strength and direction of relationships between variables.

Data analysis - qualitative data analysis

After interview, data were translated, transcribed and scrutinizing all the written statements, it was familiarized with the Data. Initial stage of the data analysis it was translated the interviewed data and unstructured data to meaningful and interpretable findings or insights. It was adopted a systematic and iterative process and handled the particular data carefully

in order to translate the data at the initial stage. Subsequently researcher did the Transcription which was a time-consuming process in order to converted raw data into accessible for analysis. Finally, transcript data was reviewed and edited for ensure the accuracy, clarity, and completeness.

Afterward, being familiarizing with the written data, systematically coding process was implemented in order to identifying and labeling relevant sections of the interviewed answers. Then grouped the similar codes and compared codes to identify recurring themes or ideas that emerge across the dataset. Subsequently it was formulated certain theme and used thematic analysis technic in order to Identify and analyze recurring themes or patterns in interview transcripts, focus group discussions, or open-ended survey responses. Categorized data into themes and sub-themes to derive qualitative insights related to the Sri Lanka Army's contributions.

Conceptual framework

In this research, agricultural projects acted as the independent
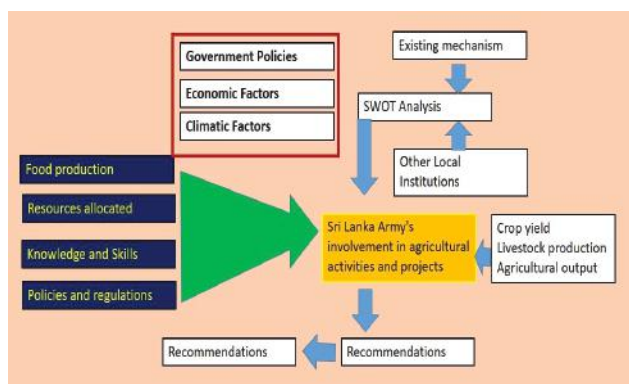

Fig. 3. Conceptual Framework

variable while Food production, resources allocated for the farms, techniques used for farming and policies and regulations acted as dependent variable. Further, researcher identified that Government policies, environmental and climate related factors as control factors of the Agricultural projects of the Sri Lanka. Finally, authors are formulated pertinent recommendations for upgrade the food security in the country through the uplifting the crop yield and livestock production (Fig. 3).

Ethical clearance

This research was conducted in compliance with the ethical guidelines set forth by the National Defense College Sri Lanka. Ethical clearance for this study was obtained from the Kotelawala Defence University Ethics Review Committee in order to conduct the research. The research design, informed

consent process, participant recruitment, and data collection procedures were all reviewed and approved by the ethical review body to ensure the protection of the ethical rights of the study participants. All participants provided written informed consent prior to their participation in the study. The informed consent process was designed to provide participants with a clear understanding of the research objectives. Participants were assured that their personal information would be kept confidential and that they had the right to withdraw from the study at any time without penalty.

Limitation of the study

To reiterate, this study examines how Sri Lankan Army, should effectively employ their troops for agriculture and animal livestock assistance for the agriculture and development projects of Sri Lanka Army. However, the following limitations have been identified during the study: In order to narrow down the study area this thesis considered only about agriculture and development projects in the Kandakadu, Andiyapuliyankulam, Maho, Dayagama, Ridiyagama and Kohilawaguruwaththa out of 21 Army farms which are functioning under the Directorate of Agriculture and Livestock in the Sri Lanka Army's. This study also does not incorporate data that spans beyond five years (before 2018).

Result and discussion

Demographic data -Age of the service personal

A sample consisting of 118 soldiers from Agricultural battalion as briefed in the methodology were selected to answer the questioners. The entire sample is presently performing duties in all battalions under command to Agricultural Directorate (Fig. 4).
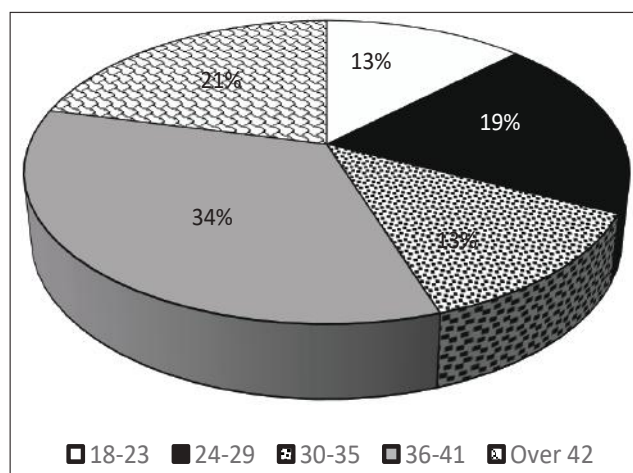

Fig. 4. Demographic data analysis of age distribution of the sample

As per the pie chart indicated in Fig. 5 majority of the partici-pants are in the age of 36 to 41 and which representing 34 % of the sample. In addition to that soldiers in the age range over 42 was the second majority which is representing 21% of the sample while age ranges of 18-23 and 30-35 representing equally and each represented 13% of the sample.

Service of the sample population

As per the Fig. 5 indicated below majority of the sample is in between 12 and 14 years of service which is representing
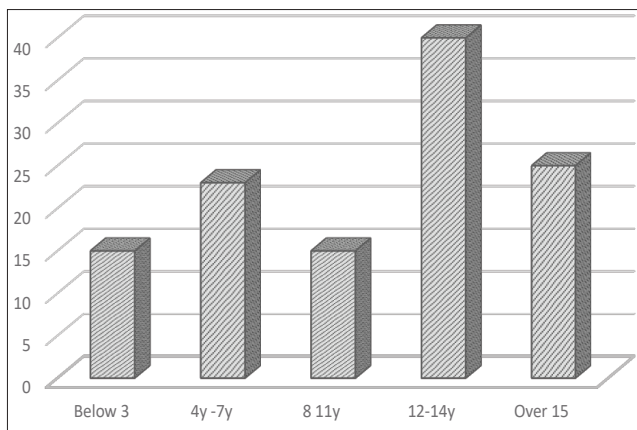

Fig. 5. Service of the Army agricultural personal

33.8% of the sample. Subsequently 21% of the sample repre-senting over 15 years of service which is the second highest. Rest of the sample services representing the 46%.

Education status

As per the bar chart indicated in Fig. 6 majority of the sample representing 72.% of the sample has only the educational qualification below O/L. In addition to that none of the sample
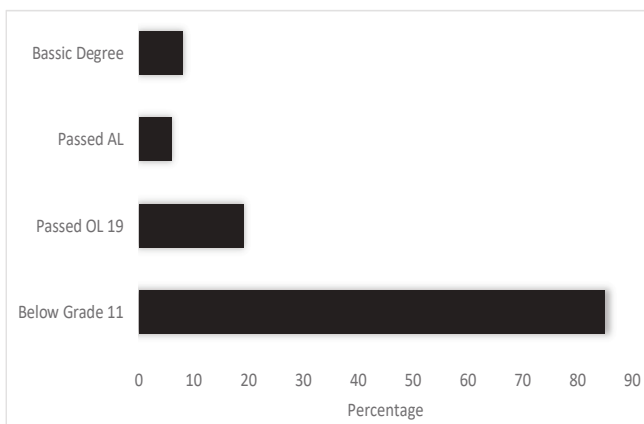

Fig. 6. Educational status of the farming Army personal

represented post graduate qualification while 7% of the sample has qualified basic degree. 16% of the sample passed the O/L examination while 5% of the sample passed the A/L examina-tion. Data represent only 28% as explained in the fig. 6.

Willingness for agriculture and cultivation in the home garden

As per the pie chart indicated in Fig. 7 majority of the sample are representing 58% of the sample were not willingly joined with the agricultural project while 42% of the sample joined with willingly for the agricultural projects.
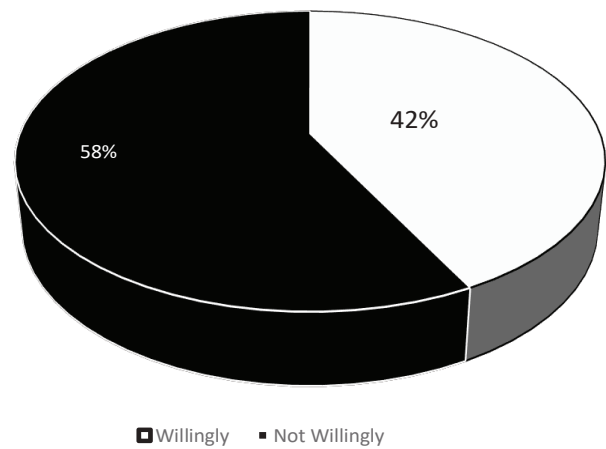

Fig. 7. Willingness to be in the agriculture field by Army farming personal

Reliability test

It was conducted a reliability analysis to assess the internal consistency of the questionnaire used to measure variables influenced to food security. The questionnaire consisted of 26 items designed to measure the said influenced. Cronbach's alpha value for the all questionnaire related to the food security as were reported as 0.783 which indicated a good level of internal consistency among the items and variables included in the analysis. The reliability test report is as shown in Table I.

Table I. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha based on standardized Items	N of tems
0.783	0.732	26

Validity test

Validity testing is fundamental to the research process, as it

Table II. Validity Test Indications

Variable	Kaiser-Meyer-Olkin measure of sampling adequacy.	Significant value
Agricultural Project	0.841	0.01
Food Production	0.842	0.01
Resources allocated	0.855	0.01
Knowledge	0.801	0.01
Policies and Regulation	0.841	0.01

helps ensure that the data collected and the measures used accurately represent the constructs being investigated, contributing to the reliability, credibility, and overall quality of the research outcomes. The result of the validity test is as shown in the tabulate indicated in Table II.

As per the Kaiser-Meyer-Olkin measure of sampling adequacy value indicated that above 0.5 and it is confirmed validity of the variables and questionnaire and those significance value also less than the 0.01. Hence it's indicated that the variables and questionnaire passed the validity test (Table II).

Variable Analysis – Correlation between Agricultural project and rest of variables

Correlation between agricultural project and food production was measure using correlation measurement in SPSS. As per the Table III result, it was observed that Pearson correlation

Table III. Correlation between agricultural project with food production, resource, policies and knowledge

	Pearson correlation	Sig. (2-tailed)
Food production	0.205*	0.026
Resources	0.108	0.245
Policies	0.077	0.408
Knowledge	0.084	0.368

*Correlation is significant at the 0.05 level (2 tailed)

value is 0.205. Significant was measured by Z test (n=118) and observed value is 0.026. Thus, it indicates a weak positive linear relationship between agricultural projects and food production which were analyzed (Table III).

Thus, it indicates a weak positive linear relationship between agricultural project and resources and technology two variables being analyzed. Further, that Pearson correlation value is 0.1 for this category and two tailed significance value was 0.245 and it was indicated that a

weak positive linear relationship between the two variables being analyzed (Table III).

In section of agricultural project and policies and regulation. A correlation coefficient of 0.07 indicates a weak positive linear relationship between the two variables being analyzed. It was further confirmed by two tailed significance value was 0.408 which is not significant at the 0.05 significance level (Table III).

It was measured the correlation among both variables of Agricultural project and knowledge and skills. A correlation coefficient of 0.08 indicates a weak positive linear relationship between the two variables being analyzed and two tailed significance value was 0.368 and it was indicated that a weak positive linear relationship between the two variables being analyzed (Table III).

Qualitative data analysis

Sri Lanka Army's targets and strategies

During the interview, Interviewer Alpha, an Officer Commanding at Kandakadu Agricultural farm stated that

"Kandakadu farm has certain targets formulated to achieve in term of ensuring the high production of foods".

Further, during the interview he stated that "the Sri Lanka Army initiated gigantic projects in terms Green Agriculture in order to supplement and promote the island's food security programme by cultivating more than 1500 acres of barren or abandoned state lands across the country. Most of the emergency projects have been started year 2022 as a supportive mechanism to the government's cultivation drive".

Furthermore, interviewer Bravo, an Officer Commanding one of an agricultural farm belong to Sri Lanka Army stated that

"The aim of these agricultural project was joined hands with the agricultural sector to reach national goals and multiply food production process through immediate cultivation of unattended lands to avert any shortage of food varieties in future".

Moreover, he stated that "Sri Lanka Army has formulated certain strategies to achieve the said goal".

In addition to that both of them stated that "Sri Lanka Army soldiers have good potentiality for enhance the food security by engaging agricultural activities by using its large numbers of strength and resources. As per the Ministry of Defence, Performances report year 2021, it has mentioned that "All

agricultural farms in Sri Lanka Army have been established to achieve the certain targets out of which "Cultivate certain crops such as Cashew, mango, various grains and spices, Enhance the liquid milk production and adjoining productions, eggs, freshwater fish, vegetating annual crops, Deployment of 25,000 of layer animals in Army farms in order to meet the annual requirement, enhance salt production, annual production of jungle ration bags from Army Farm Kandakadu , Annual production of organic manure, Growing crops annually using organic manure , Producing compost annually and supply them to the Sri Lanka Fertilizer Corporation"

Hence, it can be stated that above mentioned two Officer's Commanding statements related to strategies and targets related to food security and productions formulated by Sri Lanka was true and actions are on processing.

Challenges and barriers to food security

All the interviewees including interviewer bravo, interviewer alpha, interviewer charlie and interviewer Delta Stated that "they are presently encountering numerous challenges in agricultural farms in terms of investment in infrastructure, sustainable agricultural practices, climate-resilient strategies, effective policy formulation, and coordinated efforts among various stakeholders, further they stated that these challenges will obstructs the achieving lasting food security in the country".

Interviewer Bravo said that "out of said challenges and issues which were highlighted by the interviewers, labour shortages, cost of storage facilities and cost of transportation facilities are the main issues while skilled and knowledge and high cost of production also impacted to significant level to the Army farms."

As per the Sri Lanka Army Performance Report – 2022 and Ministry of Agriculture Annual Performance Report – 2020, Shortages of labor's, supply chain issues, post-harvest losses and impact of wild life, cost of commodities and fertilizers, Increase production and productivity of paddy and other filed crops to reduce imports and self-sufficiency are the main challenges both Sri Lanka Army and entire country's agricultural sector are encountering at present. Further, Performance Report – 2020 Ministry of Agriculture Expenditure Head No – 118, mentioned that "skilled cadre issues, working capital issue, land reclaim commission issue on lands are also significantly effects to food production in Sri Lanka Hence interviewees' statements on the existing challenges can be considered as true and prevailed."

Knowledge on agriculture and farming

All the interviewees stated that "Sri Lanka Army provides training and education to soldiers on various skills, including agriculture, farming, and harvesting".

Further, interviewer Bravo stated that "Sri Lanka Army has organized certain training courses that cover various aspects of agriculture, including soil management, crop cultivation, pest control, and irrigation techniques".

Interviewer Alpha stated that "30% of soldiers employed under their farming centers have followed at least an agricultural course while majority around 70% have only the traditional knowledge on agriculture".

All the interviewees highlighted that "specific trainings need to be conducted which has to be covered harvesting techniques, optimal timing for harvesting different crops, and post-harvest handling to minimize losses".

Further, an officer stated that "training need to be designed collaborations with agricultural universities and it will able soldiers to participate in workshops, seminars, and training programs related to agriculture"

Interviewer Charlie, a commanding officer of an Army Farm stated that "acquiring knowledge related to soil, fertilizer, irrigation and harvesting and pertinent skills are essential for individuals whom are engaging in agriculture and farming to achieve optimal productivity, sustainability, and success in the agricultural sector. Further, they stated that continuous learning, staying updated with advancements, and practical application of these skills are key to thriving in the field of agriculture."

As per the Sri Lanka Army Performances report 2022, Sri Lanka Army formulated training programs to teach knowledge and skills required for Agriculture and Livestock. In order to achieve the said training objective Sri Lanka Army conducted few vocational training courses for soldiers such as Basic Agriculture and Livestock Course, Advance School of Agriculture and Livestock Course, Specialized Agriculture and Livestock Course and Spiritual Bio Dynamic Traditional Agriculture Certificate Course at Sri Lanka Army School of Agriculture and Livestock.

Modern technologies in farming and agriculture

Interviewer Bravo and interviewer Alpha stated that "modern technologies have revolutionized the field of farming and agriculture, significantly improving efficiency, productivity,

and sustainability. Further both of them "stated that these modern technologies are continually evolving and are critical in addressing countries agricultural challenges, promoting sustainability, and ensuring food security for a growing population. Hence it is need to be encouraged to adopt and adapt these technologies to enhance productivity and achieve sustainable agricultural practices".

Interviewer Delta stated that "Indoor Vertical Farms which is utilizing vertically stacked layers to grow crops under controlled indoor conditions, saving space and resources while increasing yield is a latest technology using at present. Further he stated that soilless cultivation of plants in nutrient-rich water solutions, allowing for efficient use of water and nutrients could be a best solution to Sri Lanka"

Moreover, interviewer Echo stated that "self-driving machinery that can plant, monitor, and harvest crops, improving efficiency and reducing labor needs as well."

As per the Ministry of Agriculture performances report 2022, there are certain good agricultural practices, technology applications can be used for farming such as " technologies of the Fourth Industrial Revolution (4IR), such as the Internet of Things (IoT), Artificial Intelligence (AI), Information and Communication Technology (ICT), and intelligent packaging (IP), large data processing, (big data) to increase productivity in the agricultural sector. , Virtual Reality (VR), Augmented Reality (AR) Food Security as well as Food Quality (NIR - Diode Array in Food Testing), as appropriate for the country. Hence it can be stated that interviewees highlighted modern areas and technologies can be integrated to existing farming in the country.

Compost and organic fertilizer

According to both Officer Commanding interviewer Alpha and Bravo, the Sri Lanka Army does produce compost for use in farming. Interviewer Bravo and Alpha stated that "this practice was implemented in line with sustainable and environmentally friendly agricultural practices, improves soil health, decreases waste, and encourages sustainable farming both within the army and possibly in partnership with nearby communities".

Further, interviewer Delta stated that "the import of chemical fertilizer cost t-he nation a significant amount in lost foreign exchange. The Sri Lanka Army has lately started a number of organic fertilizer production projects to aid the nation's farming population and agricultural efforts. He asserted that enabling and putting into practice the government's strategy of encouraging the inorganic fertilizer".

As per the Sri Lanka Army performances report 2022, compost production has been introduced to all Army farms due to restrictions on the use of chemical fertilizers and which has been deliver it to the Sri Lanka Fertilizer Corporation for further dissemination among the farmers. As per the ministry of agriculture, utilization of compost fertilizer will increase the harvest, improve the soil condition, supply the vitamins, hormones and plant enzymes and preserve the nutrition as well. Hence it can be stated that arranging compost at Army farms is good decision of the food security of the country.

Sri Lankan Army has been involved in various agricultural projects and initiatives aimed at contributing to food security in Sri Lanka. These projects are part of the broader efforts by the government and various organizations to address food security challenges in the country. Similar way Pakistan Amy also contributing a lot on economic development at Pakistan. The Pakistan Army operates several agriculture farms across the country (Khan and Ahmed, 2019). These farms are used for research, experimentation, and the cultivation of various crops. The knowledge and experience gained through these farms are often shared with local farmers to improve agricultural practices. Nevertheless, Sri Lanka Army farms not actively deal with research and experimentation task and their primarily aimed to gain crop yield and harvest.

The Pakistan Army plays a significant role in disaster relief operations, particularly during natural disasters such as floods and earthquakes (Jabbar and Makki, 2021). These operations often include providing food and agricultural support to affected communities to help them recover and regain their food security. Nevertheless, Sri Lanka Army also playing significant task in terms of mitigating the hardship during disaster situation, Sri Lanka Army not caring out Disaster Relief and Rehabilitation task in terms of food security and farming (Tillekaratne *et al.* 2021). As same as Kandakadu Army farm in Sri Lanka which is upgrading as a model farm, the Pakistan Army has established model farms to promote modern and efficient farming techniques. (Sattar, 2020). These farms serve as training centers for local farmers and provide them with guidance on best practices in agriculture.

Both Pakistan and Sri Lanka Army acting a crucial role in preserving the environment and ensuring food security. The Pakistan Army has been involved in reforestation projects to combat deforestation and improve the ecological balance, which, in turn, contributes to long-term food security. Given the vulnerability of Pakistan to climate change and natural disasters, the Pakistan Army has also

been involved in promoting disaster-resilient agricultural practices. This includes the use of drought-resistant crops and techniques to minimize the impact of climate-related challenges whereas Sri Lanka Army has no such plans or contingencies to address the such issues. (Rafique *et al.* 2023). The Pakistan Army engages with local communities to promote agricultural development and enhance food security. They work closely with farmers, providing them with seeds, tools, and training to improve crop yields and livelihoods whereas Sri Lanka Army has lack of concerned on this regard.

It was found that Sri Lanka Army possesses significant infrastructure and resources that can be leveraged for agricultural projects. This includes land, equipment, research facilities, and training centers that can be utilized to enhance agricultural productivity and support food security initiatives. Nevertheless, it was fund that army is facing limitations in terms of funding and equipment for conducting large-scale agricultural projects. Insufficient resources can impede the implementation and success of food security initiatives and agricultural development efforts. It was revealed that the Sri Lanka Army's primary expertise lies in defense and security operations. However, agricultural projects require specialized agricultural knowledge, which the army may lack in certain areas. This limitation can hinder the effectiveness and sustainability of agricultural initiatives. Further, it was fund that the army may lack dedicated agricultural research facilities and expertise required for innovation and the development of advanced agricultural practices, which can limit the effectiveness of their interventions.

It was observed that economic challenges, budget cuts, or financial crises within the country can limit the availability of funds for agricultural projects and food security initiatives. Insufficient funding can constrain the implementation and expansion of programs. Further it was fund that addressing these threats requires a multi-faceted approach, including integrated pest management, disease surveillance and control, biosecurity measures, research into resistant crop varieties, education and training for farmers, and international cooperation to control the spread of invasive species.

It was understood that collaboration with local agricultural bodies and organizations is a crucial aspect of enhancing food security. Further it was observed that such collaboration has not been or suboptimal. Collaboration is essential for maximizing the impact of efforts aimed at enhancing food security (OECD-FAO, 2022). Furthermore, it was fund that overcoming barriers and promoting a culture of cooperation and shared objectives can lead to more effective and sustainable outcomes for food security initiatives. Furthermore, it

was observed that technological unawareness can present a significant challenge when it comes to enhancing food security and agricultural development, particularly if it affects both the Sri Lanka Army and local agricultural bodies (OECD-FAO, 2022).

It was revealed that prevailing traditional farming methods may not be optimal for maximizing yields and sustainability. Shifting to modern, more efficient agricultural practices is often challenging due to deeply ingrained traditional approaches. It was revealed that inadequate infrastructure such as irrigation systems, roads, and storage facilities can lead to post-harvest losses and reduced market accessibility, impacting both farmers' incomes and food availability. It was fund that insufficient education and training opportunities for soldiers, especially in advanced agricultural techniques, financial management, and market-oriented approaches, limit their ability to improve productivity and access markets effectively. It was revealed that the Sri Lanka Army can conduct training programs to educate the soldiers joined to the farming projects on modern agricultural techniques, sustainable farming practices, pest management, and efficient use of resources. This capacity-building effort will enhance agricultural productivity (Jayasiri *et al.* 2023).

It was fund that the army can contribute to developing essential agricultural infrastructure, including irrigation systems, roads, cold storage facilities, and market centers. This development will improve connectivity, reduce post-harvest losses, and facilitate the transportation of agricultural produce. It was observed that the Sri Lanka Army can collaborate with agricultural research institutions to conduct research on innovative agricultural practices, climate-resilient crops, and sustainable farming technologies. This research can lead to better practices for enhancing food security.

Conclusion

The Sri Lanka Army's role in civilian agricultural initiatives offers both strengths and challenges. Leveraging their considerable resources, logistical capabilities, and disciplined structure, the military has the potential to significantly contribute to agricultural development and, consequently, food security. Their involvement can enhance agricultural productivity, facilitate distribution in challenging regions, and provide a sense of security, promoting stability for sustained growth. Addressing food security in Sri Lanka necessitates a comprehensive and collaborative effort involving various stakeholders, including the Sri Lanka Army. Recognizing the interdependence of factors such as climate change, agricultural practices, infrastructure, community

engagement, and disaster resilience is essential in formulating effective strategies to improve food security. The Sri Lanka Army, leveraging its strengths and resources, can play a pivotal role in contributing to this multifaceted challenge. Together, these stakeholders can work towards a future where food security is not only a goal but a sustainable reality for Sri Lanka, improving the lives of its people and ensuring a resilient and thriving agricultural sector.

Recommendations

By implementing these recommendations, the Sri Lanka Army can further strengthen their contributions to agricultural projects and food security, ensuring a more sustainable and impactful involvement in the agricultural sector. The recommendations can be formulated based on the study are as follows: It is recommended to conduct capacity building and training. Prioritize training and capacity building programs within the Army, focusing on agricultural expertise and sustainable farming practices. Collaborate with agricultural institutions and experts to design specialized training modules. It is recommended to actively engage with local communities to understand their specific agricultural needs and involve them in the planning and execution of agricultural projects. Establish community-focused initiatives for more targeted impact. It is recommended to technology integration, invest in modern agricultural technologies and encourage their adoption by farmers. Establish research units within the Army to explore and implement innovative solutions for enhanced agricultural productivity.

Advocate for supportive policies at the governmental level to promote sustainable agriculture and food security. Collaborate with relevant authorities to ensure effective policy implementation and compliance. Foster partnerships with governmental agencies, non-governmental organizations, research institutions, and private sector entities to collectively address agricultural challenges and implement sustainable agricultural projects. Promote sustainable farming methods, such as organic farming and efficient water management, to reduce environmental impact and ensure long-term agricultural productivity Enhance disaster preparedness strategies and collaborate with disaster response agencies to ensure a swift and coordinated response during agricultural emergencies, safeguarding crops and farmers' livelihoods.

Conduct public awareness campaigns on the importance of supporting local agriculture and consuming locally produced goods to create a market preference for local agricultural products. Establish innovation hubs and research centers within the Army to facilitate research and development activities focused on addressing agricultural challenges and improving food security. Create mechanisms to link farmers to markets directly and encourage value addition to agricultural products, empowering farmers and improving their economic prospects. Collaborate with neighboring countries on agricultural knowledge exchange, joint research projects, and regional initiatives to enhance agricultural productivity and food security. Implement a robust monitoring and evaluation system to track the progress and impact of agricultural initiatives, allowing for timely adjustments and improvements.

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