



FOOD INTERVENTION PROGRAMS ON FOOD SECURITY IN NASSIR COUNTY, SOUTH SUDAN

Bernard Nyataya, Dr. Simon Obwatho (PhD), Dr. Kimani Gichuhi (PhD) & Fredrick Obunga

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¹ Nyataya, B., ² Obwatho, S., ³ Kimani, G., & ⁴ Obunga, F.

^{1,2,3,4} Africa Nazarene University [ANU], Kenya

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ABSTRACT

Widespread hunger and malnutrition persist today despite considerable growth in per capita food availability. This has prompted an evolving conceptualization of food security and of mechanisms to attain and maintain food security. The study aimed at establishing food security and food intervention programs designed to respond to the threat of hunger. The primary objective of the study focused on the effects of food intervention programs on food security in Nassir County, South Sudan. The specific objectives of the study were guided by four variables; emergency response programs, mid-term intervention, long term food intervention and coping strategies. The Theory of Change and Stakeholders Theory anchored the study variables. The descriptive research design was adopted, and in the process proved significant in establishing the existing relationship between the variables. The study target population was 9,996 individuals obtained from different institutions as outlined. A sample of 370 individuals was considered by the researcher. The reliability tool was determined by the use of SPSS Software version 25. Quantitative data was analyzed using descriptive statistics and presented in percentages, mean and standard deviation. The data collected was analyzed using descriptive statistics and presented in percentages, mean, and standard deviation. The study used inferential statistics to test the hypotheses. The study revealed that an emergency response program with $p=0.489$ has a weak insignificant positive effect on food security in Nassir County. Secondly, mid-term food intervention with an $r(215) = 0.048$, $p=0.001 > 0.05$ showed that there was significant and positive moderate effect on food security. Thirdly, long-term food security intervention with a $r(215) = 0.208$, $p=0.003$ showed that there was a significant and positive moderate effect on food security. Finally, coping strategies with a $r(215) = -0.17$, $p=0.807 > 0.05$ demonstrated that there is an adverse (negative) effect on food security. The study recommended that a multi-sector response with a lens for relief, development and peace initiatives would be effective in addressing food security.

Key Words: *Emergency Response Program, Mid-Term Intervention, Long-Term Intervention, Coping Strategies, Food Security*

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INTRODUCTION

Achieving food security in its totality continues to be a challenge not only for the developing nations, but also for the developed world. Moreover, existence of differences that lies in the magnitude of the problem in terms of its severity and proportion of the population affected. In developed nations the problem is alleviated by provision of target food security interventions which includes food aid in the form of direct food relief, food stamps, or indirectly through subsidized production (Abdisalam, 2022). Moreover, these approaches have employed in South Sudan but with less success. It should however be established that discrepancy in the results may be due to insufficient resource base, shorter durations of intervention, or different systems most of which are inherently heterogenous among other factors. Oryem and Noah, (2022) clearly pointed out on the fact that food intervention programs is a situation in which all people, at all times, have physical and economic access to sufficient, safe and nutritious affected by a complexity of factors. These include unstable social and political environments that preclude sustainable economic growth, war and civil strife, base, gender inequality, inadequate education, poor health, natural disasters, such as floods and locust infestations, and the absence of good governance. All these factors contribute to either insufficient national food availability or insufficient access to food by households and individuals. .

WHO (2021) pointed out on the negative implications of food intervention programmes which clearly estimated that nearly 60% of all childhood deaths in developing countries are related to chronic malnutrition and hunger. Jiang, Chen and Wang (2021), in research on global food security under COVID-19, conducted a comparison and enlightenment of policy responses in diverse countries and revealed that progress has been achieved in Northern Africa, Southern and Eastern Asia, and Latin America. However, in South Asia and Sub-Saharan Africa, high levels of hunger are noted. Specifically, Sub-Sahara has the highest rates of child

stunting, child mortality and undernourishment, compared to any region in the world and hosts 28 countries considered with the highest rates of food insecurity. FSIN (2022) indicated that hunger is at shocking levels in eight African countries including Somalia, Central African Republic, Comoros, Chad, Burundi, Democratic Republic of the Congo, Madagascar, and South Sudan.

Shimada (2022) in a study of the effect of climate-change-associated disasters on Africa's agriculture, conflicts, and economic growth, established that the Eastern African region remains to undergo an increasing tendency in the number of displaced populations with conflict and/or insecurity and climatic shocks as the leading push factors for food insecurity. Consequently, South Sudan, Ethiopia, and Sudan were among the 10 worst global food crises in 2021. According to UNHCR (2020), there are roughly 8.2 million Internally Displaced Persons (IDPs), 4.4 million asylum seekers, and refugees, in the IGAD Region, who require food and non-food assistance. The deepening effects of conflict and insecurity, climatic shocks, desert locust invasion, adversative macro-economic shocks, and the COVID-19 epidemic, coupled with prolonged food insecurity from the past shocks have led to food security disasters of an extraordinary magnitude in some of the developing countries including South Sudan (Halkos & Gkampoura, 2021).

Xu, Elomri, El Omri, Kerbache, and Liu (2021) investigated the heightened effects of desert locust invasion and the coronavirus pandemic on the food supply chain and food security and reported that approximately 80% of South Sudan's population exist in rural settings, with many of the households involved in livestock, agriculture, fisheries, and forestry as their main source of livelihood. According to The World Bank (2021), estimations on the value addition by these sectors reported 36% of non-oil Gross Domestic Product (GDP). Inadequate areas of arable land are utilized: out of the projected 64 million hectares of land, only 50 percent of it is cultivatable prime agricultural land, of which only 4 percent (approximately 2.8 million hectares) is

cultivated periodically or continuously. The real area cultivated in any one year in South Sudan has fluctuated between a minimum of 1% and a maximum of 2% of the whole land area – i.e., from about 800, 000-1.3 million hectares. Extensive areas of unused agricultural land, vast water resources, and high levels of natural resources offer massive livelihood prospects for those staying in peri-urban and urban areas (WHO, 2021).

According to FAO (2021), food security conditions continue to worsen in South Sudan aggravated by local conflicts, a weakened economy, poorly functioning markets, inadequate or lack of infrastructure, decades of conflict-associated asset diminution, and cumulative effects of frequent flooding including disruption of livelihoods and population displacement. Further, the report notes that in 2017, a famine was controlled because of the humanitarian community's sustained and urgent multi-sector response. Notwithstanding several efforts to implement peace with some extent of political advancement in the past two years, the Revitalized Agreement on the Resolution of the Conflict in South Sudan which was signed on 12th September 2018, new hotspot of civil unrest, and violent conflicts continued to arise through 2020 and continued through 2021 (Erinle, Ogwu, Evivie, Zaheer, Ogunyemi & Adeniran, 2021).

According to Shimada (2022), the majority of the nation is inaccessible during the rainy seasons due to a lack of resources, inadequate institutional capacity for the government, a lack of resources or restricted ability for the private sector, and inadequate infrastructure. In addition, the nation lacks the expertise and resources to operationalize agricultural development projects, leaving it unable to do so. Due to the decreased desire of merchants to participate in local market economies and the resulting deterioration of market functionality, prepositioning, acquiring, and distributing humanitarian aid has become not only expensive but also difficult, (World Bank, 2021). Shimada (2022) noted that since 2019, flooding incidents have occurred three years in a row, aggravating the

nation's multifaceted crisis with rising water levels that are high enough to rush through banks, submerging crops and pasture, disrupt dykes, damage household assets and public infrastructure, and in the worst cases, result in the loss of human and animal lives.

As per FAO (2021), while over 1,700 000 individuals did not recover fully from the 2019/2020 floods, a projected 650 000 more individuals across the country were harmed by the floods of October 2021. The most affected state, Jonglei, recorded damage to more than 45 percent of its entire cereal cultivation area in nine affected counties, equivalent to 26 892 ha of land destroyed and 11, 916 tons of cereal lost. The United Nations, through the Office of the High Commissioner for Refugees, raised an alarm that, there is a really high risk that the measures executed to avert the spread of Coronavirus pandemic (COVID-19), significantly disrupted the already fragile state in South Sudan (Malish, 2020). This is a result of issues such as limited access to services, weak and under-resourced health infrastructure, severe food insecurity, and a large number of internally displaced persons (IDPs) residing in cramped shelters or clogged camps (UNHCR, 2020). Because of these measures, market connections are reduced for both consumers and traders, thereby leaving producers deprived of access to vending their products and purchasers short of access to agricultural inputs, food, or other household requirements.

Vallet, Frankenberger, Presnail, Otieno, Fu, and Lee (2021) reiterated that this has amplified the cost of doing business since supply chain disruptions and access restrictions have led to damaged livelihoods and loss of household incomes. Furthermore, the introduction of lockdown measures has also resulted in significant disruptions to agriculture consulting services, significantly restricting access for farmers, particularly during crucial growth seasons. Upper Nile State in South Sudan's Nasir County, an administrative region, is extremely poor and lacks infrastructure. The County's economy depends on small-scale agriculture, with erratic yields. In 2021,

Nasir County was among the 34 counties classified under acute food insecurity. In Nasir, the main shocks causing food insecurity included floods that damaged shelters and crops, high food prices, low yields due to floods and inaccessibility of markets due to flooding. There is a limit to the amount of food circulation due to budgetary and access constraints, and logistics, hence prioritizing local food production in the current environment, which is well-defined by both natural and man-made shocks. This necessitates prompt attention and humanitarian help. As these response interventions can have adversative impacts on agricultural production in the subsequent season, a follow-up response requires to be set in place to lessen those effects. This study, therefore, seeks to examine the effect of food intervention programs on food security in Nassir County, South Sudan.

Statement of the Problem

The World Food Program (WFP) of the United Nations (UN) estimates that 957 million people in 93 different countries are hungry (Petrikova, 2022). Goal 2 of the Sustainable Development Goals (SDGs), which is focused on eradicating hunger and ensuring that everyone has access to healthy food, has received a lot of attention from the UN (Halkos & Gkampoura, 2021). A humanitarian reaction aiming at saving lives has been sparked by the ongoing famine crisis in South Sudan. According to WFP estimates, 7.24 million people experienced severe food insecurity between April and September 2021 of which 108,000 faced famine; 2.4 million were in the emergency phase as a further 4.6 million faced stressed food security levels and needed urgent targeting under the various modalities (Vallet, Frankenberger, Presnail, Otieno, Fu, & Lee, 2021).

Notable midterm effects of hunger include; seasonal migration, insecurity, disease, loss of productivity, and death while some long-term consequences are; disability, high mortality rates, ailing economies, permanent displacement of population and malnutrition. The potential zero sustainable impact has been undermined by challenging conditions in Nassir County due to

extreme levels of acute food insecurity, political instability, violence and poor infrastructure, high dependence of food imports and climate related crisis. The United Nations (UN) and World Food Program (WFP) based much emphasis on the Sustainable Development Goals (SDGs) Goal 2 which anchored on achieving zero hunger and universal access to nutritious and safe food. To achieve zero hunger, a combination of emergency programs, short, long-term food security interventions and coping strategies need to be re-analyzed.

The government has over the years strive on ways of addressing food security. Moreover, the need for the adoption of a clear and precise strategic plan was of significance to Nassir County. It was mainly attributed by the need for having adaptive and flexible approach to tackling shocks, engaging the government to facilitate resources that enhances sustainability, need for good collaboration among involved players and finally opting for innovative approaches. Despite the findings on the hunger outlook in South Sudan, there is limited research that focuses on the appropriate food security interventions in South Sudan. The study seeks to incorporate food security response strategies which include emergency response programs, mid-term and long-term food security interventions, as well as coping strategies in addressing food security in Nassir County.

Objectives of the Study

The primary objective of the study focused on the effects of food intervention programs on food security in Nassir County, South Sudan. The study was guided by the following:

- To ascertain how emergency response strategies, have an effect on-food security in Nassir County
- To find out the effects of mid-term interventions on food security in Nassir County.
- To establish the effects of long-term interventions on food security in Nassir County.
- To provide information on coping strategies on food security in Nassir County.

This study sought to test the following hypothesis;

- **H0₁**: In Nassir County, there is no statistically significant relationship between emergency response programs and food security.
- **H0₂**: In Nassir County, midterm interventions have no statistically significant impact on food security.
- **H0₃**: In Nassir County, there is no statistically significant link between long-term interventions and food security.
- **H0₄**: The impact of coping mechanisms on the availability of food in Nassir County is not statistically significant.

LITERATURE REVIEW

The study was guided by two theories; Theory of Change and Stakeholders Theory.

Theory of Change

The proponents of the Theory of Change (ToC) are not clearly defined but it can be traced to the field of development where it is seen to have grown out of the tradition of logical planning (Piras, Tobiasz-Lis, Currie, Dmochowska-Dudek, Duckett, & Copus, 2021). Moreover, the theory is an outcomes-based approach. As a concept, ToC has a strong base in the fields of sociology, environment, political science, and psychology (Brook & Akin, 2019). The major principles informing the ToC are that it dwells on the process, which aids the practitioner think systemically with clear purpose and indicators. Also, the theory prioritizes learning. It therefore means that when it is applied, the practitioners have to keep reflecting and finding adaptive approaches to circumnavigate any challenge. The theory of change advocates for stakeholders' participation upon evaluation of policies and programs that articulates how the intervention is purposed to operate and the mechanisms by which it is designed to produce results (King, 2021). Furthermore, it was asserted that it is important to take note of the processes for value creation that describe how interventions tend to use resources effectively, efficiently, and in a way that generates enough value to justify resources.

In their work, Gilissens, et al (2018) emphasized the need for understanding the ultimate effect and

long-term outcomes to be achieved. Naturally, organizations can articulate their strategies, activities and mission. However, organizations often find it difficult to handle clarity or internal consensus as to how they will realize their mission. The scope of the theory of change is reliant on different aspects such as the complexity of the context and the interests, resources and timing, of the organization and/ or the initiatives putting in mind the imaginable, sharing information whenever possible and recognizing the limitations and values. Different researchers in various fields have applied the ToC in their work. O'Connor, et al.(2021) on the other hand, emphasized that the theory seeks to allow agents to draw on present knowledge and better contribute to the collective knowledge regarding how to achieve meaningful change.

Stakeholders Theory

Freeman (1984) advanced the concept of Stakeholders theory, where he emphasized the need to steer businesses objectively and by extension maximize stakeholder's value for sustainability. On the other hand, seconded by Kim, Chun, and Wang (2021) anchored the fact that the stakeholder's theory upon the incorporation of corporate social responsibility base much emphasis on discovering social matters in management, constituting limited and often which enhances operational efficiency. Further, it is of great significance to note that the stakeholders are important for the existence and success of an entity or organization. Moreover, the possession of a devolved unit is considered a congregation of several stakeholders created politically and in a political environment to act on behalf of the citizens with a focus on development. To attain this there must be a close association between all the actors and parameters necessary for effective access to and utilization of public resources.

The public can invoke the principle of stakeholder resource through which stakeholders can institute an action against the executive for failure to accomplish the required duty (Freeman, Dmytriiev, & Philips, 2021). This act as a guideline mainly

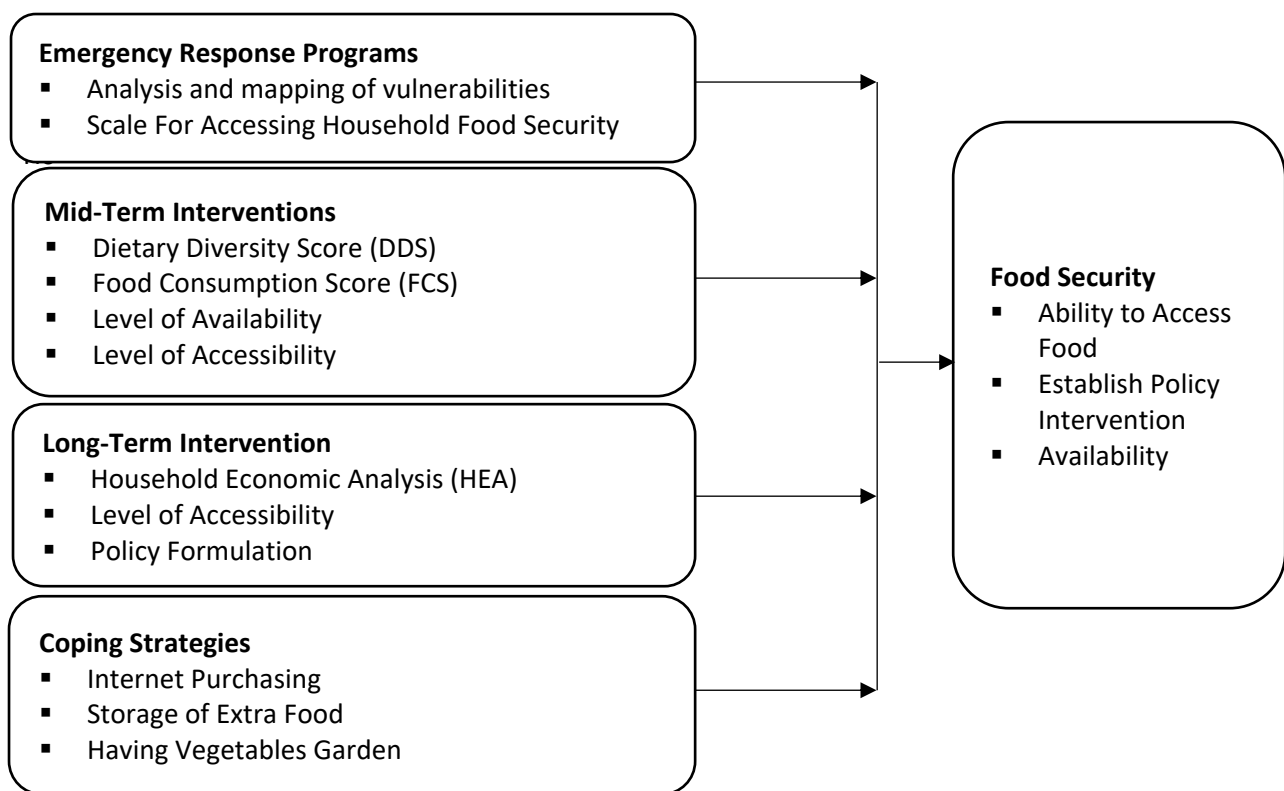
focused on high levels of improved leadership qualities and integrity. The need for stakeholder values necessitates that a series of devolved units delivers aimed at addressing the current food situation by extension gauging the performance. This theory is relevant to the study since organizations emphasize on service delivery returns to stakeholders as they go about their daily operational and decision-making processes. The study focuses on operations by the organizations to guarantee adequate provision of services and provisions to the stakeholders, including but not limited to food security. On the other hand, Dmytriyev, Freeman, and Horisch (2021) infer that the stakeholders' theory is more a normative approach that may be argued to be morally and ethically acceptable than the shareholders' value approach. Moreover, stakeholders tend to be viewed as important by the instrumental stakeholder theory aimed at addressing the stakeholders needs and is a good practice in business. By taking good care of the stakeholders, they positively influence management,

which leads to success, thereby contributing to profitable strategic value.

Ramoglou, Zyglidopoulos, and Papadopoulou, (2021) who are among the proponents of this theory suggest that the primary perspective of the instrument's theory is organizational performance which is part and parcel of financial growth. Much emphasis was on the fact that for increased organizational performance there must be a focus on staff and stakeholders. Consequently, since the main objective of the perspective is to gain benefits, stakeholders and staff have to be managed well. The theory addresses the significance of the humanitarian response programs installed in South Sudan.

Conceptual Framework

The variables investigated in this study are depicted diagrammatically in Figure 1 Food security is the dependent variable in the study, while the independent variables are emergency response programs, mid-term-term, and long-term food security interventions, as well as coping strategies.



Independent Variables

Dependent Variable

Figure 1: Conceptual Framework

Source: Author (2023)

METHODOLOGY

The study adopted descriptive research design. The descriptive research design enabled the researcher to gain deeper insights as regards to the issues linked with food intervention programs. As a matter of fact, through exploration, the researcher was in a position of understanding the issues that led to the introduction of the food intervention programs. This was done through literature review as well as primary data. The researcher learned about the food intervention programs on food security for Nassir County and its stakeholders, during the administration of research questionnaires. These international organization representatives included program managers from World Vision International (WVI), Relief International (RI), Adventist Development and Relief Agency (ADRA), and GOAL. Beneficiaries (IDPs/Host Communities, returnees), community leaders, local authorities, the Universal Network for Knowledge and Empowerment Agency, Nile Hope, and Community Health & Development Organization (CHADO) among others. The target beneficiaries are spread across seven (7) administrative areas (Payams) of Dingkar, Jikmir, Kiech, Kuerenge-Ke, Mading, Maker, and Roam. From these organizations and stakeholders, the possible population under consideration amounts to approximately 9,104 household heads, beneficiaries, refugees, IDPs and returnees, 234 officers working for the international community/organizations, 482 officials working for the local non-governmental actors, and 176 officials working for the local authorities. Accordingly, the total target population was 9,996. The questionnaire captured both qualitative and quantitative information. This engaged participants with both closed-ended and open-ended questions. For closed-ended interviews, the research instrument contained quantitative measurements such as Likert scales, which required the respondents to rate the extents and levels of agreement with various statements presented. The significance of the responses were considered to add value to the quantitative data gathered from the open-ended questions.

The questionnaires and other sources were evaluated and assessed as part of the data analysis. Before processing the responses, the field data was examined and compared to select the most accurate and quality information from the feedback supplied by different respondents. The questionnaires that have been completed were reviewed for consistency and completeness. The acquired raw primary data was coded before being entered into the Statistical Package for Social Sciences (SPSS, Version 25) program. The data collected was solely quantitative, and it was examined using descriptive statistics. MS Excel and SPSS assisted the researcher to characterize the data and establish the amount to which it was used. In addition, the researcher adopted a multiple regression analysis to assess the strength of the association between the variables. This provided a qualitative and quantitative explanation of the study's goals. The regression equation was be: $Y = 0 + 1X_1 + 2X_2 + 3X_3 + 4X_4 +$

Y = food security, X_1 = emergency response programs, X_2 = mid-term interventions, X_3 = long-term interventions, and X_4 = coping techniques. Furthermore, 0 represents the regression intercept, while 1, 2, 3, and 4 represent the regression coefficients. Coefficients and = Error term normally distributed about a mean of 0 and considered to be 0 for calculating purposes. Multiple regression allows the researcher to estimate a score for one variable based on their scores for several other factors. Multiple regression is used to understand the relationship between the independent and dependent variables. The study provided quantitative reports based on central measure, percentages, and tabulations. The findings provided in the form of figures and tables.

FINDINGS

Emergency Response Program

Five statements were developed to measure the extent to which emergency response program has an influence on food security. As shown in Table 1 The discoveries established in statement (1) Do you think that the emergency response program address

National, Inter-communal and localized conflict in Nassir County, out of 215 who participated in the study, 40(19%) of the respondents Strongly Agreed, 74(34%) Agreed, 45(21%) were Neutral, 29(13%) of the respondents Disagreed and 27(13%) Strongly Disagreed. This item had a mean 3.36 and standard deviation of 0.311, which is lower than the composite means of 3.2 with a standard deviation 0.28, implying that the statement does not positively influence food security linked with emergency response program.

The study also established that statement (2) noted that emergency response program has yielded to reduced cattle raiding, children & woman abductions, cyclical revenge killing and gender-based violence (GBV), out of 215, 33(35%) of the respondents Strongly Agreed, 80(37%) of the respondents Agreed, 51(24%) of the respondents were Neutral, 30(14%) of the respondents Disagreed and 21(10%) of the respondents Strongly Disagreed. This item had a mean of 2.97 and standard deviation of 0.343 which is lower than the composite mean implying that the statement did not address the issues of food security in Nassir County.

The statement (3) noted that the emergency response program has mitigated the occurrence of natural calamities such as flooding and droughts, out of 215, 36(17%) of the respondents Strongly Agree, 71(33%) of the respondents Agreed, 64(30%) of the respondents were Neutral, 26(12%) of the respondents Disagreed and 18(8%) of Strongly Disagreed. This item had mean of 3.34 and standard

0.142, which was higher than the composite means 3.2 and standard deviation 0.28. The item showed that majority of the respondents agreed with the statement implying that being an aspect of emergency response program enhances food security in Nassir County.

On the other hand, statement (4) that clearly pointed out on emergency response programs have addressed the manifestation of human disease, pests and conditions such as Covid-19 calamities, out of 215, 45(20%) of the respondents Strongly Agreed, 96(45%) of the respondents Agreed with the statement, 55(26%) of the respondents were Neutral, 12(6%) of the respondents were Disagreed and 9(4%) of the respondents Strongly Disagreed. This item had a mean of 3.21 and standard deviation 0.261. The study implied that having a mean of 3.21 equal to the composite mean clearly note that there is a strong implication of emergency response program on food security.

Finally, the statement (5) on having emergency response program fully addressed the economic challenges, out of 215, 39(18%) of the respondents Strongly Agree, 83(39%) of the respondents Agree, 47(22%) of the respondents were Neutral, 33(15%) of the respondents Disagreed and 12(6%) of the respondents Strongly Disagreed, with a mean of 3.28 and standard deviation 0.325. It was clear that that the mean was higher than the composite mean which clearly suggest that the item discussed strongly has an impact on food security.

Table 1: Emergency Response Program Descriptive Results

Statement	Level of agreement Frequency (%)					Mean	Std. Dev
	SA	A	N	D	SD		
Do you think that the emergency response programs address National, Inter-communal and localized conflict in Nassir County?	40(19)	74(34)	45(21)	29(13)	27(13)	3.36	0.311
The emergency response programs have yielded to reduced cattle raiding, children & women abductions, cyclical revenge killing and gender-based violence (GBP)	33(15)	80(37)	51(24)	30(14)	21(10)	2.97	0.343
Have emergency response programs have mitigated the occurrence of neutral calamities such as flooding and droughts	36(17)	71(33)	64(30)	26(12)	18(8)	3.34	0.142
Do you think emergency response programs have addressed the manifestation of human disease, pests and conditions such as Covid-19 calamities?	43(20)	96(45)	55(26)	12(6)	9(4)	3.21	0.261
Have emergency response programs fully addressed the economic challenges	39(18)	83(39)	47(22)	33(15)	12(6)	3.28	0.325
Composite Mean/SD						3.2	0.28

*Frequency percent are in Parenthesis

Mid-Term Interventions

Six statements were developed to measure the extent to which mid-term intervention influences food security. As shown in Table 2, it was well outlined by statement (1) adoption of food consumption dietary diversity has enhanced food security, out of 215, 44(20%) of the respondents strongly agreed with the statement, 85(40%) of the respondents agreed, 51(24%) of the respondents were Neutral, 21(10%) of the respondents disagreed while 14(7%) of the respondents strongly disagreed with a mean of 3.46, standard deviation 0.305 which is higher than the composite mean and composite standard deviation. It implies that majority of the respondents agreed that mid-term intervention enhances food security.

On the other hand, statement (2) claimed that over the past seven days, the main source of food was cereals, grains and roots, out of 215, 29(13%) of the respondents strongly agreed, 73(34%) of the respondents agreed, 66(31%) of the respondents were Neutral, 21(10%) of the respondents disagreed and 15(7%) of the respondents strongly disagreed with a mean of 3.05 and standard deviation 0.319. With a higher composite mean and composite standard deviation is clearly that majority of respondents agreed with the statement which an implication on food security.

Do you think that over the past seven days, the food supplied to every member of the household was sufficient being statement (3), out of 215, 47(22%) of the respondents strongly agreed with the statement, 76(35%) of the respondents agreed with

the statement, 30(14%) of the respondents were Neutral, 37(17%) of the respondents disagreed while 25(12%) of the respondents strongly disagreed with mean 3.11 and standard deviation 0.214. With a lower composite mean and composited standard deviation, it was evident that the statement has no influence of food security.

The available source of food for every household was nuts and legumes, statement (4), out of 215, 41(19%) of the respondents strongly agreed, 69(32%) of the respondents agreed with the statement, 59(27%) of the respondents were neutral, 34(18%) of the respondents disagree, 12(6%) of the respondents strongly disagreed with a mean 3.03 and standard deviation of 0.222 which is lower than the composite mean and standard deviation suggest that majority of the respondents disagreed with the statement that influences food security.

Statement (4) that claim that yesterday, during the day and night, did members of your household

eat/drink, out of 215, 39(18%) of the respondents strongly agree, 74(34%) of the respondents agreed, 53(32%) of the respondents were neutral, 30(14%) of the respondents disagreed and 9(4%) of the respondents strongly disagreed with a mean of 2.99 and standard deviation 0.343. With a lower composite mean but a higher standard deviation suggest that majority of the respondents disagreed with the statement and its impact on food security.

Over the past seven days, members of your household were able to eat (Statement 5), out of 215, 37(17%) of the respondents strongly agreed, 87(40%) of the respondents agreed, 46(21%) of the respondents were neutral, 25(21%) of the respondents disagree and finally 20(9%) of the respondents strongly disagreed with mean of 3.17 and standard deviation of 0.189. With a mean higher than the composite mean suggests that statement being a factor of mid-term intervention influences food security.

Table 2: Mid Term Food Security Descriptive Results

Statement	Level of agreement					Mean	Std. Dev
	Frequency (%)						
	SA	A	N	D	SD		
Adoption of food consumption dietary diversity has enhanced food security?	44(20)	85(40)	51(24)	21(10)	14(7)	3.46	0.305
Over the past seven days, the main source of food was cereals, grains and roots?	29(13)	73(34)	66(31)	21(10)	15(7)	3.05	0.319
Do you think that over the past seven days, the food supplied to every member of the household was sufficient?	47(22)	76(35)	30(14)	37(17)	25(12)	3.11	0.214
The available source of food for every household was nuts and legumes?	41(19)	69(32)	59(27)	34(16)	12(6)	3.03	0.222
Yesterday, during the day and night, did members of your household eat/drink?	9(18)	74(34)	53(25)	30(14)	9(4)	2.99	0.343
Over the past seven days, members of your household were able to eat	37(17)	87(40)	46(21)	25(12)	20(9)	3.17	0.189
Composite Mean /SD						3.13	0.27

*Frequency percent are in Parenthesis

Long Term Intervention

Four statements were developed in trying to establish the significance of long-term intervention on food security. Statement (1) noted that there food security safety nets to protect vulnerable population, out of 215, 33(15%) of the respondents strongly agreed, 61(28%) respondents agreed, 58(27%) were Neutral, 41(19%) of the respondents disagree, 22(10%) strongly disagree with a mean of 3.10 and standard deviation 0.239. Moreover, statement (2) established that there are proper policy frameworks that clearly address long term security, out of 215, 31(14%) of the respondents strongly agree, 64(30%) of the respondents agreed, 57(27%) of the respondents were neutral, 46(21%) of the respondents disagreed and 17(8%) of the respondents strongly disagreed with a mean of 3.24 and standard deviation of 0.119.

Statement (3) suggest that majority of the respondent's existence of specified institutions tasked with handling the food security policies. 40(17%) the respondents strongly agreed, 69(32%) of the respondents agreed, 60(28%) of the respondents were neutral, 33(15%) of the respondents disagreed and 13(6%) of the respondents strongly disagreed with a mean of 3.52 and standard deviation 0.362. The researcher also established in statement (4) that there was active monitoring and evaluation of food security intervention, where out of 215, 41(19%) of the respondents strongly agreed, 71(33%) of the respondents agreed, 59(27%) of the respondents were neutral, 40(19%) of the respondents agreed and 4(2%) of the respondents strongly disagreed with a mean of 3.12 and standard deviation 0.321. With a mean lower than the composite mean showed that the statement does not sufficient implication on food security.

Table 3: Long Term Interventions on Food Security

Statement	Level of agreement					Mean	Std. Dev
	SA	A	N	D	SD		
Are there food security safety nets to protect vulnerable populations?	33(15)	61(28)	58(27)	41(19)	22(10)	3.10	0.239
Is there a proper policy framework that clearly addresses long term food security?	31(14)	64(30)	57(27)	46(21)	17(8)	3.24	0.119
Existence of specified institutions tasked with handling the food security policies?	40(17)	69(32)	60(28)	33(15)	13(6)	3.54	0.362
Is there active monitoring and evaluation of food security interventions?	41(19)	71(33)	59(27)	40(19)	4(2)	3.12	0.321
Is there a recent (within 1 year) food security baseline survey conducted?	41(19)	77(36)	30(14)	39(18)	28(13)	3.40	0.162
Composite Mean/SD						3.28	0.24

*Frequency percent are in Parenthesis

Coping Strategies on Food Security

Moreover, the research established level of agreement of respondents with the effect of coping strategies on food security as the measurement with construct developed i.e., Coping Strategies Index. As shown in table 4, a composite mean of 3.12 demonstrated that respondents agreed with the

effect of coping strategies as an aspect of food intervention program on food security. The statement (1) pointed out on the CSI strategies adoption produces timely , reliable and meaningful information about the access of food at the individual or household level, out of 215, 47(22%) of the respondents strongly agreed, 84(39%) of the

respondents agreed, 40(19%) of the respondents were neutral, 27(13%) of the respondents disagreed and 17(8%) of the respondents strongly disagreed with a mean of 3.23 and standard deviation of 0.339. Since the mean is higher than the composited mean, it means that there is a positive impact of the statement in relation to food security.

Coping Strategies Index (CSI) is easy to apply at low cost in any individual or household survey. As a matter of fact, 38(18%) of the respondents strongly agreed, 66(31%) of the respondents agreed, 44(20%) of the respondents were neutral, 44(20%) of the respondents disagreed, 28(13%) of the respondents strongly disagreed with a mean of 3.25 and standard deviation of 0.314. A mean of 3.25 which is higher

than the composite mean suggest that majority of respondents agreed with the statement which affects food security.

On the other hand, adoption of the CSI analysis has created prevalence rates which can be compared between cultures., out of 215, 49(23%) of the respondents strongly disagreed, 91(42%) of the respondents agreed, 52(24%) of the respondents were neutral, 20(9%) of the respondents disagreed and 3(1%) of the respondents strongly disagreed with a mean of 3.36 and standard deviation 0.302. A mean of 3.36 is higher than the composite mean, therefore claim that there is a positive relation between the statement and food security.

Table 4: Coping Strategies

Statement	Level of agreement					Mean	Std. Dev
	SA	A	N	D	SD		
CSI strategies Adoption produces timely, reliable and meaningful information about the access of food at the individual or household level.	47(22)	84(39)	40(19)	27(13)	17(8)	3.23	0.339
Coping Strategies Index (CSI) is easy to apply at low cost in any individual or household survey.	38(18)	66(31)	44(20)	37(17)	30(14)	3.06	0.313
CSI is a direct measure of food security experienced by people and households	29(13)	59(27)	55(26)	44(20)	28(13)	3.25	0.314
CSI allows for analysis of gender differences in food security when applied to individual level.	42(20)	73(34)	51(24)	37(17)	12(6)	3.02	0.310
Adoption of CSI analysis has created prevalence rates which can be compared between cultures	49(23)	91(42)	52(24)	20(9)	3(1)	3.36	0.302
CSI deepens our understanding of the determinants and consequences of individuals and households affected by food security when used in conjunction with other indicators.	35(16)	75(35)	64(30)	22(10)	19(9)	2.78	0.279
Composite Mean/SD						3.12	0.31

*Frequency percent are in Parenthesis

Joint Impact on Food Security

Additionally, the study demonstrated a summary of the joint correlation and regression analysis results on the impact of food intervention programs (emergency response programs, mid-term food intervention, and long-term food intervention and coping strategies) on food security using multiple regression model.

Correlation Analysis

The Bivariate Pearson Correlation output in Table 5 indicated that mid-term food interventions, $r(204) = .232, p = .001$, and emergency response programs, $r(204) = .208, p = .003$, have a significant and moderately positive correlation with food security.

Table 5: Food Intervention Programs on Food Security Joint Correlation Analysis Results

Variables		Emergency Response Program	Mid-Term Food Intervention	Long-Term Food Intervention	Coping Strategies	Food Security
Emergency Response Program	Correlation	1				
	Sig. (2-tailed)					
	N	215				
Mid-Term Food Intervention	Correlation	.092	1			
	Sig. (2-tailed)	.186				
	N	215	215			
Long-Term Food Intervention	Correlation	-.089	-.279**	1		
	Sig. (2-tailed)	.199	.000			
	N	215	215	215		
Coping Strategies	Correlation	.408**	-.393**	.199**	1	
	Sig. (2-tailed)	.000	.000	.004		
	N	215	215	215	215	
Food Security	Correlation	.048	.232**	.208	-.017	1
	Sig. (2-tailed)	.489	.001	.003	.807	
	N	215	215	215	215	215

** . Correlation is significant at the 0.01 level (2-tailed)

The results further provided that there is a weak insignificant positive correlation between emergency response program on food security, $r(204) = .048, p = .489$. Also, results indicated that there is inverse correlation between coping strategies on food security, $r(204) = -.017, p = .807$ (see Table 5).

Regression Analysis

The study further conducted a joint regression analysis to report a combined-on food intervention programs on food security (see Table 6). The established $R = .370$ is the coefficient of determination which illustrates the correlation between independent variables (emergency response program, mid-term food intervention, long-term food intervention and coping strategies) and food security as the dependent variable. The

established $R - \text{Square} = .137$ indicate that food intervention programs only explain 13.7% changes in food security ($F(4, 204) = 8.107, p < .001, R^2 = .137$). This suggests that there could be other dimensions of food intervention program which has an impact on food security and not included in this study.

Additionally, the outcomes in Table 6 further demonstrated that though all the independent variables (emergency response program, mid-term food intervention, long-term food intervention and coping strategies) have positive coefficients, only mid-term food intervention and long-term food intervention have significant values less than 5% level. The findings showed that the study rejected the stated null hypotheses of both mid-term food intervention ($B = .255, p < .001$) and long-term food intervention ($B = .435, p < .001$) and concluded that

there is a significant and positive influence of both mid-term food intervention and long-term food intervention on food security. As for emergency response programs and coping strategies, the study accepted the null hypotheses and concluded that there is no significant influence of both emergency response program ($B = .017$, $p = .723$) and coping strategies ($B = .036$, $p = .604$) on food security.

The findings, therefore, indicated that when all factors are held constant, food security would be

.095. However, execution of food intervention programs would only contribute about 1.7% and 3.6% in terms of emergency response programs and coping strategies to food security respectively. Also, improvement in the implementation of food intervention program would contribute about 25.5% and 43.5% in terms of mid-term food intervention and long-term food intervention on food security respectively.

Table 6 Food Intervention Programs on Food Security

Model Summary & ANOVA					
R	.370 ^a				
R – Square	.137				
df	4, 204				
F – Statistics	8.107				
Sig.	.000 ^b				
Model	Coefficients		Coefficients		Sig.
	Unstandardized	Standardized	Unstandardized	Standardized	
	B	Std. Error	Beta	t	
1 (Constant)	.095	.419		.228	.820
Emergency Response Program	.017	.047	.027	.355	.723
Mid-Term Food Intervention	.255	.059	.327	4.347	.000
Long-Term Food Intervention	.435	.102	.293	4.263	.000
Coping Strategies	.036	.069	.043	.520	.604

a. Dependent Variable: Food Intervention Programs

DISCUSSIONS

To ascertain how emergency response Strategies affect food security

The first objective of the study was to ascertain how disaster response strategies affect food security in Nassir County. A regression analysis conducted to test the hypothesis of the study reported a higher p-value higher than the recommended significance level for testing the hypothesis. The findings confirmed the stated null hypothesis of the study that there is no significant influence of disaster response strategies affect food security. This was further supported by the descriptive findings where majority of the respondents disagreed that food intervention programs has addressed food security. Similarly, more respondents disagreed that food

intervention fully addressed food security in Nassir County.

Mid-Term Food Security Intervention on Food Security

The second aim of this research was to determine the effect of mid-term food intervention on food security in Nassir County. The study performance correlation and regression analysis to test the second hypothesis of the study; there is no factual significant relationship between mid-term food intervention on food security. From the established findings, the study accepted the alternate hypothesis and concluded that there is a significant and positive influence of mid-term food intervention on food security in Nassir County. This was further

supported by the descriptive results where most of the respondents agreed that adoption of mid-term food intervention has not fully address the issues of food security.

Long Term Food Security Interventions on Food Security

Thirdly, this study established the effect of long-term food interventions on food security in Nassir County. With regards to testing the third hypothesis, there is no statistically significant relationship between long term food interventions on food security, the regression analysis results accepted the alternative hypothesis and rejected the null hypothesis. These outcomes suggested that there is a significant and positive influence long-term food intervention on food security.

Coping Strategies on Food Security

The fourth and final objective of this study sought to provide information on coping strategies in food security in Nassir County. The aim was to test the hypothesis; there is no significant relationship between coping strategies and food security. From the regression analysis conducted, the findings clearly upheld the null hypothesis that there is no significant impact of coping strategies on food security in Nassir County. The descriptive results further supported the regression analysis that the individuals involved in the study were unaware or were neutral regarding the coping strategies and how it influences food security. The results agree or disagree with various existing results.

CONCLUSIONS

Following detailed analysis as well as comprehensive discussions of the research findings this study makes several conclusions as per the research objectives. Foremost, the research points out on the need for sufficient access to food which has been, and remains, a core challenge to the stability and security of many systems. Moreover, the increasing worldwide food bills, natural catastrophes and extreme weather event, food safety, and a universal monetary predicament have placed more focus on food as an item for security

concerns. The study further concludes that indeed there is a significant impact of disaster response strategies and how it affects food security in Nassir County.

RECOMMENDATIONS

From the results and inferences, the study gives the following recommendations with regards to food intervention programs on food security in Nassir County.

Emergency Response Program

From the study, it was clear that the individuals from the various NGO's based in Nassir County should be aware of the existing loopholes in the effective management of food security. Therefore, there is need to maximally and rightfully utilize the four factors investigated in the study because they positively influence food security. Critical emergency stocks should be pre-positioned strategically within the area to avoid contextual as well as pipeline challenges. Moreover, heading forward, more effort should be put on community led disaster risk reduction strategies and early warning systems.

Mid-term Intervention

Emphasis should be put on the routine of periodic surveys and approaches that yield to short-term obligations. The mid-term food interventions should consider capturing real time data through fully integrating information systems. It will be important to adopt a variety of mid-term strategies that can help them reach wider stakeholders and audiences. To protect gains made from the emergency response, there should be a deliberate effort towards tailoring a context-based mid-term intervention that includes seasonal livelihood programming, while embracing a community led participatory approach. Where feasible, humanitarian agencies should adopt institutional support towards existing systems in governance, health, education, food security, psychosocial support, protection, and gender-mainstreaming instead of re-inventing the wheel. While responding, there should be a deliberate effort to compliment services and share best practices as opposed to

operating in Silos that yield duplication of services as well as errors in targeting.

Long-term Food Interventions

The study recommends that the individuals should put more emphasis on the use of feedback from mid-term interventions that were of significance to form the foundations for long term interventions. There is also need for all stakeholders to develop a contextualized seasonal programming approach that utilizes locally available resources like water bodies.

There is a need for the community to embrace diet diversification away from the traditional feeding habits. This would be complimented by opening up large portions of land that are currently underutilized for agriculture. Other notable improvements relate to revising current food security policy to be context specific and an empowering of existing department of livelihoods

and agriculture. Food security should also form part of the school curriculum.

Coping Strategies

The study also established that due to localization of diet, Covid-19 related restrictions did not significantly affect the coping strategies but the challenges were mostly centered on access as well as options. High demand for hard currency has continued to affect the South Sudanese pound and by extension the purchasing power of households. Most beneficiaries resorted to barter trade to counter the inflation. Last year's erratic rains affected the sorghum yields and pasture which are the heart of the community's livelihood kitty. Informal interviews with select beneficiaries noted that they have resorted to reducing the quantities of food they cook, frequency of meals and prioritized who received the little that is available i.e.: children, the elderly, men and finally women.

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