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Food Security And Its Impact On Saudi Arabia's National Security And Gulf Security

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ABSTRACT

This study investigates the relationship between food security and national security in Saudi Arabia and the Gulf region. It examines the impact of food insecurity on Saudi national security and the broader Arabian Gulf security, identifies the major challenges and limitations facing current food security policies and programs, and proposes strategic recommendations for enhancing food security.

The study reveals direct impacts such as social unrest, economic instability, health implications, and migration, while also highlighting indirect impacts including political instability, economic consequences, social fragmentation, demographic pressures, and regional instability. The identified challenges encompass climate change, water scarcity, reliance on food imports, inefficient agricultural practices, socioeconomic disparities, and limited technology adoption. To address these challenges, the study recommends prioritizing comprehensive food security policies, increasing investments in agriculture, research, and infrastructure, and fostering collaboration among governments, international organizations, academia, and the private sector.

Concussively, the findings underscore the significance of addressing food security to ensure national and regional stability and resilience in the face of evolving food security concerns.

Keywords: Food security, national security, Saudi Arabia, Gulf region

INTRODUCTION

Food security is a significant concern for Saudi Arabia and the Gulf region due to their substantial reliance on food imports and susceptibility to environmental and economic disruptions (Alrobaish *et al.,* 2021). The Kingdom has several difficulties jeopardising food security, such as rapid population increase, acute water scarcity, the effects of climate change, and evolving dietary trends (Lambert & Hashim, 2017). Food insecurity in the region can profoundly affect national and regional security, leading to economic instability, social discontent, and political turmoil (Haque and Khan, 2022). Saudi Arabia, the largest economy in the Gulf area and a vital strategic hub, confronts considerable dangers, as any disruption to

food supplies or escalation in food prices might generate enormous ripple effects throughout the region and beyond (Mohieldin *et al.*, 2024). In recent years, Saudi Arabia and other countries in the Gulf have initiated various programs and initiatives to bolster food security, encompassing investments in advanced agricultural technology, aquaculture development, food processing, and policies designed to minimise food waste and enhance food safety (Al-Khateeb *et al.*, 2021). Nonetheless, much effort is required to tackle the fundamental causes of food insecurity and to guarantee the stability and security of the region's food supply amidst increasing demand and climate change.

The security of the countries in the Gulf Cooperation Council (GCC) is increasingly endangered by intellectual movements that advocate extremist ideologies, incite violence, and destabilize the area. Saudi Arabia, as a member of the GCC, has been actively involved in addressing these concerns (Hameed *et al.*, 2022). However, the ongoing threat posed by extremism continues to persist. To address this problem, the study could comprehend the complex characteristics of extremist beliefs, the different routes to radicalization, and how extremist organizations manipulate technology and social media platforms. The existence of unrest in nearby regions adds complexity to the task of combining security measures with concerns about civil liberties. Additionally, the significance of international cooperation further complicates attempts to tackle these dangers. Evaluating the efficacy of extremism programs is intricate because of their subtle and enduring effects. It is crucial to tactfully negotiate cultural and religious sensitivities to avoid estranging communities. Adapting policies comprehensively to respond to emerging threats is vital for enhancing the security of GCC members and ensuring durable regional peace, notwithstanding investments in counterterrorism efforts and measures for de radicalization.

Therefore, the aim of this research is to examine the relationship between food security and Saudi national security, as well as its impact on Gulf security. Therefore, the objectives have been established in the following manner: To assess the impact of food insecurity on Saudi national security and the Arabian Gulf security. To identify the major challenges and limitations facing current policies and programs for enhancing food security in Saudi Arabia and the Gulf and evaluate their effectiveness in addressing food insecurity.

MATERIALS AND METHODS

Conceptual framework

The framework shown in Figure 1 suggests that food security is the independent variable that can have an impact on the dependent variables of Saudi national security and Gulf security. The control variables of population and climate

change are likely to influence the relationship between food security and the dependent variables, and the intermediate variables of political stability and military capability may mediate the relationship.

The proposed relationship suggests that food security, as an independent variable, may directly or indirectly influence the dependent variables of Saudi national security and Gulf security. The relationship is shaped by control variables such as population and climate change, which impact food availability and access. Additionally, intermediate variables like political stability and military capability affect the Kingdom's capacity to address food-related challenges and ensure security.

Food security represents a significant challenge in Saudi Arabia and the broader Gulf region, attributed to dependence on food imports, susceptibility to external influences like climate change, and a rising demand for food. The literature indicates a strong correlation between food security and national and regional security, with food shortages potentially resulting in social unrest, political instability, and conflict.

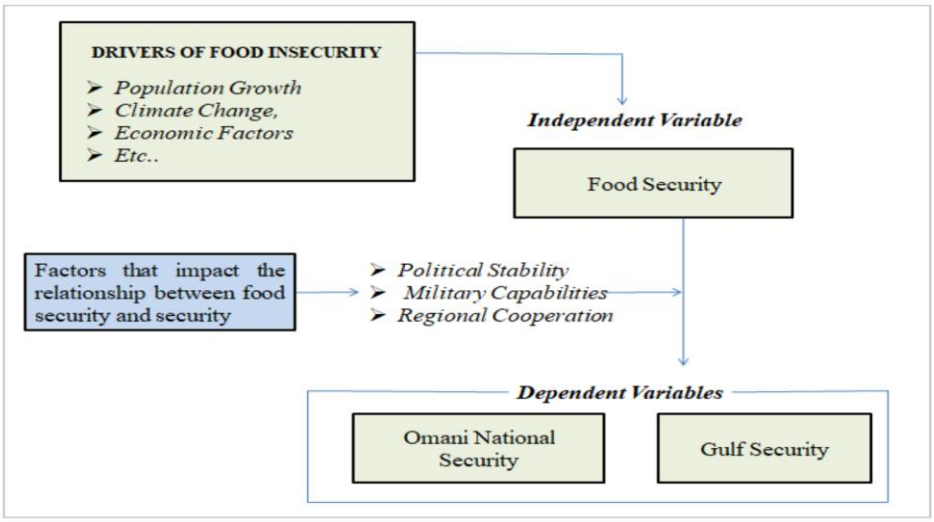

Figure 1. Conceptual Framework (Source: Author's own work).

Research methodology

The methodology for conducting the search will entail a series of steps, which will be carried out systematically and transparently to minimize potential bias and ensure reproducibility of the search results.

Research design*:*

The research will utilize a descriptive research design that aims to describe the current state of food security and its impact on Saudi national security and Gulf

security. Secondary data sources will be used to collect data on food security and national security indicators.

***Data sources**:*

Secondary data sources will be obtained from various sources such as government reports, academic articles, and international organizations' publications. The sources will be identified and reviewed through a systematic literature search using online databases.

Data collection:

Data will be collected by conducting a comprehensive review of the existing literature on food security, national security, and their relationship in Saudi Arabia and the Gulf region. The review will include a qualitative synthesis of the findings, and the main themes and patterns will be identified.

***Data analysis**:*

The data collected through the literature review will be analysed using a thematic analysis approach. The themes and patterns identified in the literature will be categorized into different groups and subgroups. The findings will then be presented in a descriptive format, highlighting the relationships and interactions between food security and national security in Saudi Arabia and the Gulf region.

RESULTS AND DISCUSSION

Food security categories.

Food security is a complex and multifaceted concept that encompasses various dimensions related to the availability, access, utilization, and stability of food. As a result, different forms or categories of food security have been developed to help understand and address the different aspects of this complex issue. These categories shown in Figure 2, each of these categories has its own unique characteristics and challenges and understanding them is crucial for developing effective policies and programs to ensure access to sufficient and nutritious food for all.

Absolute food security:

Also, known as self-sufficiency means that a country can produce enough food domestically to meet its local demand, with the possibility of exporting the surplus. In this case, the country does not depend on imports to ensure food security. Self- sufficiency is a desirable state for many countries, as it reduces the dependence on other nations and can boost the domestic economy.

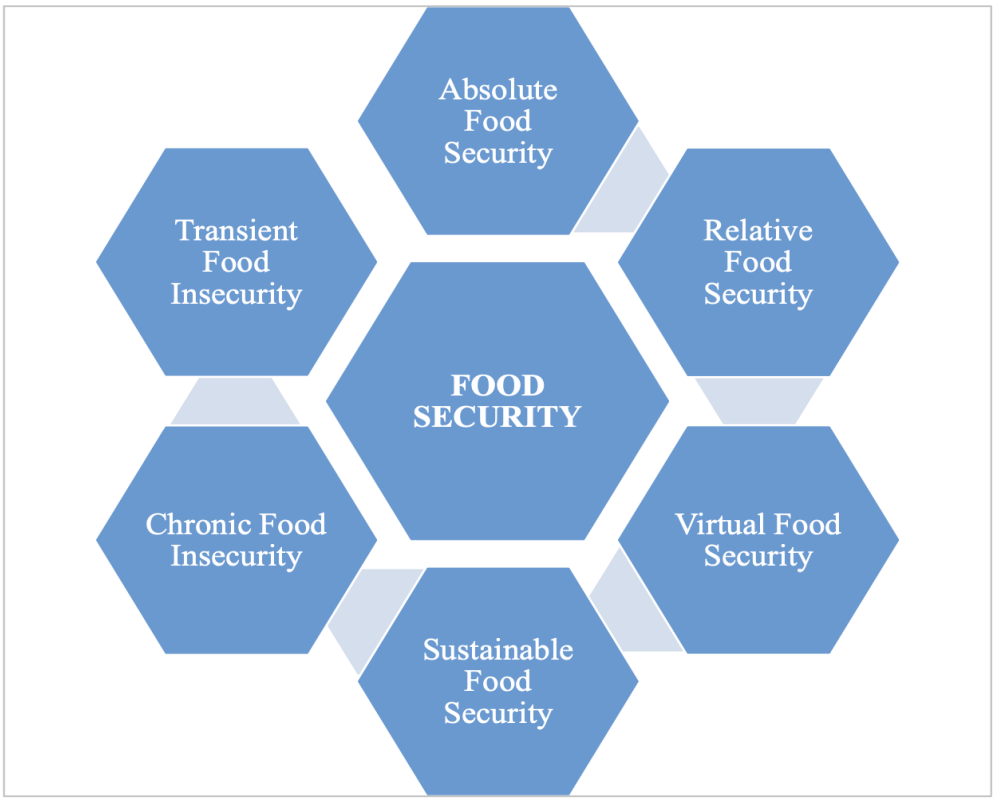

Figure 2: Food Security Categories Diagram, Source: Author's own work**.**

Relative Food Security: Refers to a country's ability to provide some food and nutritional resources either wholly or partly and to ensure the minimum level of food requirements on a regular basis. In this case, the country may depend on imports to complement its domestic food production, but it has established policies and mechanisms to ensure that the population has access to a sufficient quantity and quality of food.

Apparent or Virtual Food Security: Is a situation where a country produces 90% or more of a certain material from its domestic production, but imports most of its inputs, such as seeds, fertilizers, and machinery. In this case, the country's domestic production figures can be misleading, and its food security may not be as robust as it seems.

***Sustainable food security*:**

Refers to a long-term strategy that aims to increase agricultural productivity while enhancing the productive capacity of natural resources. This involves promoting sustainable agricultural practices, such as crop rotation, soil

conservation, and water management, to ensure that the production capacity of the land is maintained over time.

Chronic food insecurity:

Refers to inadequate food production due to a constant deficit in food acquisition. This is a persistent and long-term problem that affects the population's health and well-being. Chronic food insecurity can be caused by a combination of factors, such as poverty, conflict, climate change, and lack of investment in agriculture.

Transient food insecurity:

It is a temporary decline in a household's ability to acquire sufficient food, such as in the case of natural disasters, food price instability, and loss of employment. This type of food insecurity is usually short-term and can be mitigated through emergency relief programs, such as food aid, cash transfers, and employment schemes.

Dimensions of food security.

Food security is a critical issue that affects individuals, households, and communities worldwide. It is a multi-dimensional concept that encompasses various aspects of food availability, access, utilization, and stability.

The first dimension of food security is availability, which refers to the physical presence of food in sufficient quantities at national, regional, and local levels (Figure 3). Availability involves the production, storage, and distribution of food. A country with a high level of agricultural production and adequate storage facilities can ensure the availability of food. For example, Saudi Arabia has invested significantly in agricultural technology and storage infrastructure to enhance food availability (El-Dukheri, 2024).

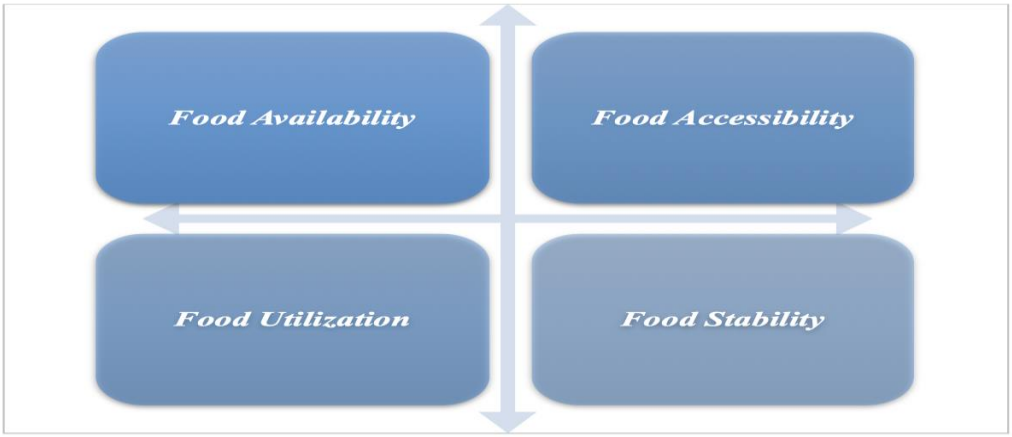

Figure 3: Dimensions of Food Security diagram, Source: Author's own work

The second dimension of food security is accessibility, which refers to the ability of individuals and households to obtain food through markets, trade, and social safety nets. Accessibility involves economic, social, and physical access to food. For example, Saudi Arabia has implemented various social welfare programs to ensure food accessibility for vulnerable populations (Alrobaish *et al.*, 2021).

The third dimension of food security is utilization, which refers to the ability of individuals and households to consume food that meets their dietary needs and preferences. Utilization involves the quality and safety of food, as well as knowledge and behaviours related to food preparation and consumption. For example, Saudi Arabia has implemented comprehensive food safety regulations and nutritional education programs (Ayad *et al*., 2022).

The fourth dimension of food security is stability, which refers to the ability of individuals and households to maintain food security over time, even in the face of shocks and stresses such as natural disasters, economic downturns, or conflicts. For example, Saudi Arabia has established strategic food reserves and diversified its food import sources to ensure stability (Elrasheed, 2024).

Food insecurity poses significant challenges to national security in both Saudi Arabia and the Gulf region. Direct impacts include social unrest, economic instability, dependency on imports, health implications, and migration and displacement. Social unrest arises from inadequate access to food, leading to public dissatisfaction, protests, and potential violence, particularly in densely populated urban areas of the Kingdom. Economic instability occurs due to decreased productivity, increased healthcare costs, disruptions in agriculture, and supply chain disruptions, with Saudi Arabia spending approximately SAR 87 billion annually on food imports (Alderiny *et al.*, 2020).

Dependency on imports exposes the Kingdom to fluctuations in global food prices and supply disruptions, with over 80% of food requirements being imported. Health implications include malnutrition, weakened immune systems, and increased vulnerability to diseases, affecting approximately 12% of the Saudi population (Bin Sunaid *et al*., 2021). Migration and displacement occur as people, particularly from rural agricultural areas, are compelled to search for better access to food and economic opportunities in urban centres, straining resources and potentially causing conflicts.

The indirect impacts of food insecurity encompass political instability, economic consequences, social fragmentation, demographic pressures, and regional instability. Political instability arises from discontent, protests, and challenges to government authority, affecting national security particularly in regions with high unemployment rates (Albejaidi & Nair, 2021). Economic

consequences include hindered economic growth, decreased productivity, and limited resources for addressing security challenges, with an estimated annual economic impact of SAR 23 billion (Alharbi et al., 2021). Social fragmentation arises from divisions due to competition for resources, deepening inequalities, and social unrest, particularly evident in the Kingdom's rapidly urbanizing areas. Demographic pressures arise from increased poverty, unemployment, and migrations driven by food insecurity, straining resources and contributing to social tensions, especially given Saudi Arabia's 1.7% annual population growth rate. Regional instability emerges when neighbouring countries face food insecurity, leading to resource conflicts and regional tensions impacting national security, particularly relevant given the Kingdom's strategic position in the Gulf region.

Current policies and programs for enhancing food security in Saudi Arabia and the Gulf face significant challenges and limitations. Climate change, water scarcity, and limited arable land pose major obstacles to agricultural production and food self-sufficiency, with only 1.6% of the Kingdom's land being arable (Al Naimi, 2022). The reliance on food imports makes the region vulnerable to global price fluctuations and supply disruptions. Inefficient water management practices and unsustainable agricultural methods further exacerbate the problem, with agriculture consuming approximately 84% of Saudi Arabia's water resources (Alrwis *et al.,* 2021). Additionally, socio-economic disparities, lack of access to resources for small-scale farmers, and limited technology adoption hinder progress. While efforts have been made to enhance food security through investment in agricultural infrastructure, technology adoption, and diversification of food sources, the effectiveness of these policies and programs in fully addressing food insecurity remains a continuous challenge.

In this study indicate that food insecurity substantially affects security at both national and regional levels via various pathways. The study illustrates that food insecurity can significantly weaken political systems, provoke social unrest, and jeopardise economic stability. Limited food access and rising prices can lead to public dissatisfaction, which may manifest as protests that have the potential to escalate into more severe conflicts. The data indicates that food insecurity exacerbates social inequalities and economic vulnerabilities, creating further security challenges. Food-related hardships often lead to population displacement and migration as communities pursue improved opportunities, thereby straining resources in destination areas and increasing social tensions. The health consequences of food insecurity, notably prevalent malnutrition and heightened vulnerability to diseases, exacerbate security issues by undermining community resilience.

This study concludes, based on comprehensive data analysis and contextual examination, that a significant correlation exists between food insecurity and security threats in KSA and the Arabian Gulf region. The empirical evidence robustly corroborates our initial hypothesis, illustrating the complex relationship between food security and regional stability**.**

Conclusively, this study has identified multiple effective strategies to tackle the intricate challenges confronting Oman and the Arabian Gulf region in achieving food security. Our findings highlight the essential need for a comprehensive and cohesive strategic framework. A comprehensive framework should include various interconnected aspects of food security, such as improved agricultural productivity, effective water resource management, reinforced climate resilience strategies, and streamlined trade networks. The research underscores the importance of ongoing investment in research and development, systematic capacity-building initiatives, strategic land use planning, comprehensive waste reduction programs, and robust social safety net mechanisms. The study concludes that adopting sustainable agricultural practices, fostering technological innovation, and cultivating solid collaborative relationships among key stakeholders in both the public and private sectors are fundamentally important. Moreover, these initiatives require robust policy frameworks and governance structures to guarantee their sustainability and effectiveness in meeting regional food security goals. This comprehensive strategy, underpinned by evidence-based policymaking and intersectoral collaboration, signifies the region's most effective route to achieving sustainable food security.

Recommendations

The Saudi Government must give top priority to the development and implementation of comprehensive food security policies to address these pressing issues. These policies must incorporate the following identified strategies and methods:

The Government should prioritize the creation and implementation of comprehensive food security policies that align with Vision 2030's goals, incorporating modern agricultural technologies and sustainable practices. This includes expanding the current SAR 5 billion agricultural technology investment program to cover 75% of the Kingdom's farming operations by 2026 (Bin Sunaid *et al.*, 2021).

It is essential to increase investments in agriculture, research and development, and infrastructure to facilitate the transition to more sustainable and resilient food systems. Collaboration between Saudi government entities, international organizations, the academic community, and the private sector is essential for knowledge sharing, technology transfer, and coordinated efforts to

address food security issues. Food security strategies should prioritize the incorporation of climate change adaptation and mitigation measures, particularly given Saudi Arabia's vulnerability to rising temperatures and water scarcity. To promote sustainable consumption patterns, reduce food waste (currently at 33%), and increase nutritional awareness, public awareness campaigns and educational programs should be initiated through a coordinated national strategy. Strengthening social safety nets, targeting vulnerable populations and ensuring their access to adequate and nutritious food should be a priority. To assess the efficacy of implemented strategies and make necessary adjustments, continuous monitoring, evaluation, and adaptive management techniques should be utilized through the newly established National Food Security Monitoring Centre.

Future work

To increase our comprehension of regional dynamics and develop context-specific solutions for Saudi Arabia, additional research is required in the following areas: Economic viability studies of implementing proposed strategies and policies, particularly focusing on the cost-effectiveness of water conservation technologies and desert agriculture. Evaluation of social and environmental impacts of agricultural interventions in the Kingdom's different ecological zones. Investigation of potential implementation barriers, especially regarding technology adoption among small-scale farmers. Research on the role of technology, digitalization, and precision agriculture in enhancing food security in Saudi Arabia, with particular emphasis on artificial intelligence and IoT applications. Studies on the integration of traditional knowledge with modern agricultural practices in the Saudi context. Analysis of climate change impacts on future food security scenarios specific to Saudi Arabia's geographical conditions.

Assessment of the effectiveness of regional cooperation mechanisms in enhancing food security. Investigation of innovative financing mechanisms for food security projects in the Kingdom. This research agenda should be pursued through collaborative efforts between Saudi research institutions, international partners, and the private sector, with adequate funding and support from relevant Government agencies.

Research limitations

During the conducting of this thesis and during the analysis of the necessary files and books, the researcher revealed some of the determinants, which are as follows: Limited Data Availability: Due to the sensitive nature of national security issues, challenge in accessing reliable and comprehensive data, which can limit the scope of study. Lack of Empirical Studies: While there are many theoretical and conceptual studies on the link between food security and national security, there is

a lack of empirical research that examines the causal relationships between these variables. Lack of Longitudinal Studies: Few studies have examined the long-term trends in food security and its impact on national security in the region, which can limit our understanding of how these issues are evolving over time.

Methodological limitations:

Different studies use different methods and definitions of food security, making it difficult to compare results across studies and draw firm conclusions.

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