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By Farukh Mohammad Azad, Dr. Tim Frazier & Erik Wood

Georgetown University

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Food Security as Correlate of Interstate Conflict: A Case Study of the State of Qatar

Farukh Mohammad Azad [α], Dr. Tim Frazier [σ] & Erik Wood [ρ]

Abstract- The literature indicates that conflict can result in food insecurity due to economic or political crisis. However, few studies have investigated the effects that nonviolent interstate conflict has on food security in the Middle East. Evidence from this study, based in Qatar, indicates that conflict can result in food insecurity due to economic or political crisis. This research critically examines the lingering political and economic blockade of the State of Qatar and the extent to which this blockade has impacted food security of residents. The study employed a sequential mixed methods approach to gain better insight into the nature of food security in Qatar. A focused qualitative review of the relevant literature was followed by a quantitative analysis which revealed that there was no significant effect of interstate conflict on food security, while the economic and political blockade correlated significantly with food security. Three groups were sampled, including government officials, regulatory agencies, and food suppliers. Suggestions were made to stakeholders in the food industry on effective emergency and disaster management practice to cushion the effects of interstate conflict on food security in disadvantaged countries with non-arable land and non-conducive climate for agriculture growth.

Keywords: food security, qatar, food supply, blockade, food quality; socioeconomics.

Note: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

I. Introduction

Food security is a major issue all over the world (Hallegatte et al., 2015). Global organizations such as the Food and Agricultural Organization (FAO), International Fund for Agricultural Development (IFAD), and World Food Program (WFP) are continuously supporting different initiatives working toward food for all by the year 2030 (McGuire, 2015). Emergency and disaster management is critical to food security, especially in low-income countries where agriculture absorbs 22 percent of the total loss from natural hazards (Baas et al., 2015). There are also challenges from different regions that prevent food security such as immigration, low incomes, political instability, conflict, and economic depression. More recently, there has been a conflict in the Middle East involving Qatar, United Arab Emirate (UAE), Bahrain, Egypt, and Saudi Arabia. The resultant economic and political blockade on all modes of transport in Qatar has food security implications within the borders of each of the countries involved.

The State of Qatar is a small peninsular country with a population of approximately 2.8 million as of 2018. According to Qatar's own Vision 2030, economic growth, social development, and environmental management are key factors for the next decade (Ministry of Development Planning and Statistics, 2017). Part of the economic vision is to ensure food security for the growing population of Qatar as the country relies on foreign labor for much of its development. However, with the ongoing tension between Qatar and its Gulf Country Council (GCC) allies that began on June 5, 2017, the food supply chain has been destabilized. Qatar imports over 90 percent of its food from overseas, most of which comes from the aforementioned neighboring countries (Amery, 2019). Due to its lack of arable land, Qatar does not have the local market resilience to handle this ongoing shortfall.

Interstate conflict resulting in food insecurity is not a new phenomenon in the Middle East (FSAC, 2017; Logistics Cluster, 2017). For instance, in November 2017, the Horthi Forces in Yemen attacked the Riyadh airport using a ballistic missile. This resulted in Saudi Arabia closing the entire Yemeni sea port, air space, as well as land ports and led to the siege of 27 million people with 500,000 metric tons of food and fuel being prevented from getting to those who needed emergency aid in that part of the world. Food insecurity tends to be increasing globally due to many issues including climate change, civil war, terrorism, increase in population, and migration. One of the consequences of conflict is food insecurity as both economic and political blockades are enforced as a reprisal attack. The consequences of food insecurity are perhaps more as it may lead to famine, violent conflict, death, poverty, high rate of migration, and various diseases. Currently, there are many lower-income countries that suffer from a food crisis with some of these countries enmeshed in perpetual war resulting in food manufacturing and supply shortages. In view of this, the conflict in the Middle East may also be the source of food insecurity and if not tackled could further exacerbate the conflict and humanitarian situation in the Middle East (Altare and Sapir, 2013; Justino et al., 2013; OCHA, 2017).

Author α: e-mail: fma75@georgetown.edu
Author σ: Professor of the Practice and Faculty Director, School of Continuing Studies (SCS) at Georgetown University.
e-mail: Tim.Frazier@georgetown.edu
Author ρ: Adjunct Professor (Ethics, Research, GIS) Georgetown University. e-mail: exw6@georgetown.edu

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The main objective of this study was to examine the extent to which interstate conflict and economic and political blockade correlate with food security in the Gulf region with specific reference to Qatar and its current relationship with some members of the GCC. Emergency and disaster management is important to the sustenance of food security as conflict and natural disasters have been shown to lead to the loss of 1.50 trillion US dollars in economic damage between 2003 and 2013 (Baas et al., 2015). During the same period in low-income countries, 550 billion US dollars have been lost in economic damage due to disasters, while 200 million people have been said to be affected by disasters (Baas et al., 2015). However, past studies regarding conflict and food security (e.g., FSAC, 2017; Logistics Cluster, 2017) have tended to examine intra-state conflict and food security or food insecurity with dearth of research attention on the relationship between interstate conflict and food security in the GCC. This study was, therefore, designed to critically investigate interstate conflict as it correlates to food security in the GCC in order to fill the gap in the literature.

II. Methodology

In order to explore the plausible linkage between interstate conflict and food security, this study first reviews relevant past and recent studies and subsequently adopts both qualitative and quantitative methods to capture the relevant themes and data with respect to the methodology. Thematic analysis is done on the qualitative results, while inferential and descriptive statistics are employed for the quantitative method. Recommendations are made based on the findings. The study is limited to the Qatar food supply, household food consumption, government intervention in food supply, and food security. The participants of the study were food consumers in Qatar, while businesses and government officials in food-related activities were sampled as key informants. The variables included interstate conflict, economic blockade, political blockade, and food security. Data to test the research questions came from 10 semi-structured interviews of some conveniently sampled companies from the food business community and a government ministry in charge of food and water regulation, as well as 119 conveniently selected households in Qatar. The methodology was a mixed methods approach involving both a qualitative and quantitative phase. Both phases underwent statistical analysis demonstrated in the results section of this study (4.0) to determine patterns and form conclusions.

a) *Focused Literature Review*

This mixed methods approach began with a focused review of the relevant literature which is an accepted method when establishing a foundation for a novel or scarcely explored topic, a theoretical model, or to encourage future research (e.g., Schober and Annis, 1996; Yilmaz and Youngreen, 2016). Keyword searches included the words "Qatar" + "blockade" + "food supply" in various Boolean arrangements. Secondary search terms were added to these three core keywords and included, for example, "nutrition" or "food quality", "import" and "agriculture" or "interstate/intrastate" and "conflict." Authors noted the lack of robust research on this topic. Examples of databases accessed through a university library included Academic Search Planner, ProQuest Central, and Emerald Intelligence. Google Scholar was also utilized, not only to search for relevant literature and double-check the university resources, but to determine where the core articles (e.g., Chenoweth and Cunningham, 2013; Bellemare, 2015; Pettersson and Wallensteen, 2015; Lambert and Hashim, 2017; Akkaş, 2018; Amery, 2019; Martin-Shields and Stojetz, 2018; Brück et al., 2019) had themselves been cited to potentially gather more from the existing literature. Articles that were considered even "slightly relevant" or "likely relevant" were read completely for further assessment. However, only 13 core, peer-reviewed articles were retained for being relevant to the focused literature review.

b) *Research Design/Methods*

This research adopted both interpretivist and positivist approaches. Research has shown that the use of both paradigms tends to be more effective in seeking knowledge about a particular area. Since the two philosophical perspectives are complementary, with one offsetting the weaknesses of the other, results are considered stronger than if only one method was employed (Creswell, 2003; Bryman, 2012). The benefit from using both interpretivist and objectivist ontological approaches rests on the fact that the researcher is objective by being neutral and focused primarily on the phenomena of interest, while simultaneously highly critical through in-depth analysis (Johnson and Onwuegbuzie, 1994; Johnson, 2014). Furthermore, the appropriate research design for this study was the cross-sectional design in which the samples of the study were simultaneously selected without treating any specific group differently (Sedgwick, 2014; Spector, 2019). This research design has been shown to be appropriate for exploratory and explanatory research (Robinson et al., 2008) and it also has feasibility advantages (Mann, 2003; Dooley, 2009). Mixed method emphasizes collecting, analyzing, and using both qualitative and quantitative data in one single study (Creswell and Plano, 2011) while having the benefit of providing a better understanding of research problems than the use of either approach separately (Creswell 2003; Borkan, 2004; Creswell and Plano, 2011).

Two groups of participants were conveniently selected for the study. The first group was interviewed, and the second group was surveyed. The interviewed

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group included companies in Qatar dealing in food supply, processed foods, food manufacturing, agro-allied companies, and the government ministry that regulates the activities of the food sector. The second group of participants was the survey group, which consisted of household individuals who were conveniently selected at different malls in and around Doha in Qatar. The responses of the interviewees were coded, and consistent themes were identified based on the research questions and the objectives of the study, while the quantitative data were analyzed. The following research questions were tested:

1. To what extent would interstate conflict affect food security in Qatar?
2. To what degree individual beliefs about political and economic blockades affect their perception of food security in Qatar?"
3. To what extent would household characteristics, economic and political blockade jointly and independently affect their perception of food security in Qatar?

c) Population/Sample of the Study

The population of interest in the study is all the companies that produce foods, import foods to Qatar, restaurant owners who sell foods, those who sell processed food items, and food regulatory agencies as well as all food consumers in the State of Qatar who buy food for household consumption (i.e., end-users) in the food supply chain cycle. The researchers conveniently selected 10 interviewees who represent the food business community as seen in Table 1, including one food regulatory agency, which led to 10 potential interviews conducted over one week. Each interview lasted 20 to 30 minutes.

Table 1: Characteristics and sample sizes of the companies in the study

Samples	Sectors	N	Total
Restaurant owners	Private	3	3
Regulatory agencies	Public	1	1
Food suppliers	Private	4	4
Agro-allied companies	Private	2	2
Total			N = 10

Consumers who purchase food items for household consumption were those in the second group of participants. These individuals were people who purchase food for their personal consumption or the consumption of their households. 119 (n = 119) individuals who were consumers at various major malls and supermarkets in Qatar were conveniently selected.

d) Sampling Method

Due to limited time, relatively high cost, and the difficulty of conducting probability sampling, a convenience sampling method was used to select the samples of the study. Convenience sampling can be defined as a method of selection in which the researcher chooses the individuals or objects based on their availability and the researcher's accessibility to them (Dörnyei, 2007; Etikan et al., 2016). According to Etikan et al., (2016), convenience sampling is no more than mere accidental selection in which the researcher selects only those individuals or objects that (s) he has most access to and are available to be selected. The justification for adopting this sampling technique is based on the research participants being easily accessible and convenient to select (Samure and Given, 2008).

To collect relevant data from the two groups of participants, interviews and questionnaires were adopted. The interviews were used as the means of collecting relevant information from the first group of participants who belong to the food business community and are at the manufacturing, processing, and supply sides of the food supply chain in Qatar. The interviews were semi-structured as the participants were required to also mention other relevant information that might not have been captured by the interview questions. Each interview took a maximum of 30 minutes and interviews took place in the offices of the interviewees. The interviews were recorded separately using a mobile phone, and notes were also taken to complement the audio recording.

An online structured questionnaire was used to collect data from the second group of participants who were solicited individuals who buy food for personal or household consumption based on average, individual, and typical consumer behavior. The participation of the research subjects was solicited based on their willingness to be drawn into the study at their various points of purchases of food items in various malls in Qatar. It was at this initial point of interaction that the researcher explained the purpose of the study to the individuals verbally and requested for their email addresses. The researcher sent email messages individually to those who provided them.

The questionnaire was divided into distinct sections with each section capturing different information and variables. For example, section 'A' of the questionnaire was used to access relevant household demographic variables such as head of the household gender and monthly income. Other sections of the structured online survey questionnaire comprised of other variables such as perception of conflict and

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perception of food security. The first section of the questionnaire collected quantitative data consisting of questions on household and participants' characteristics, which were age, gender, gender of the head of the household, educational qualification of the head of the household, and household monthly income.

To measure the Dietary Diversity Score (DDS) of the research participants, the researchers employed the DDS adapted from the Arab Family Food Security Scale (AFSS) developed and validated by Sayhoun et al. (2014). The DDS is a subscale of AFSS, which was originally designed by the Food and Nutrition Technical Assistance (FANTA) to capture the nutritional dimension of food security (Swindale and Bilinksy, 2006). The DDS information may be used to assess the nutritional state of an individual. The seven items in the DDS were subjected to revalidation and they yielded inter-item scores ranging from 0.51 to 0.68, while the composite Cronbach reliability alpha coefficient score for the seven items was 0.60 (Table 2).

Table 2: Summary of Cronbach reliability test scores for each of the Likert scales

S/N	Names of Scale	Number of items	Reliability scores
1	Dietary Diversity Scale	7	0.60
2	Interstate conflict scale	7	0.64
3	Economic blockade	5	0.79
4	Political blockade	5	0.84
5	Arab Family Food Security Scale	7	0.88

e) Perceptions of Conflict Scale and Blockade

The next section of the questionnaire comprised of the measure of perception of interstate conflict, which was a self-administered scale specifically developed for the research and anchored on a 3-point Likert-type rating scale with degrees of responses ranging from 'never' to 'always.' The questionnaire was developed through a literature search and was validated prior to its adoption for the main study. Sample questions in the six-item scale included 'how often do you think about the conflict between Qatar, Saudi Arabia, UAE, and Bahrain?' The scale was scored in a manner in which respondents with a high score were rated high on perception of interstate conflict in the GCC, while low scores implied low perception of interstate conflict. The scale was revalidated to ensure it was suitable for the sample and the content was well understood by the respondents. Inter-item correlation for the six items indicate acceptable reliability alpha coefficient scores ranging from 0.47 to 0.71, while the entire items in the questionnaire yielded a Cronbach reliability alpha coefficient of 0.64 (Table 2).

Respondents' subjective assessment of the ongoing economic blockade of Qatar was measured with a scaled format. Sample items included "Economic blockade of Qatar has caused acute shortages of key supplies (e.g., labor, construction materials)." Respondents were required to agree or disagree with the statements on a three-point Likert-type rating scale with anchors ranging from 'Strongly agree' (3) to 'Strongly disagree' (1). The scale was scored such that high scores represented strong perceptions of the economic blockade, while low scores reflected low perception of the economic blockade. Authors of this study revalidated the scale to ensure it was suitable for the respondents. The scale inter-item alpha coefficient ranged from 0.72 to 0.82, while the composite reliability alpha coefficient for the five items was 0.79, which was higher than 0.70 suggested by Nunnally (1978) and Nunnally and Bernstein, (1994).

Perception of the political blockade among respondents was assessed by adapting the scale initially developed to measure economic sanctions by Kokobisaghi (2018) to assess the political blockade. The scale was anchored on a three-point Likert-type rating scale ranging from 'Strongly agree' (3) to 'Strongly disagree' (1) and comprised of five items to which respondents were required to indicate the extent of their agreement or disagreement. High scores represented a strong perception of political blockade of Qatar, while low scores were reflective of a low perception of the political blockade of Qatar. In the current research, after revalidation of the scale, it yielded an alpha reliability coefficient of 0.83, while the inter-item coefficient scores ranged from 0.74 to 0.84.

The Arab Family Food Security Scale (AFFSS) was employed to measure perception of food security among the respondents. The AFSS was developed and validated by Sayhoun et al. (2014) and consisted of seven items to which respondents were required to indicate their levels of agreement or disagreement on a three-point rating scale that ranged from 'Strongly agree' (3) to Strongly 'disagree' (1). The composite scores of respondents were computed on the AFFSS since it was the criterion variable in the current study. The scale basically assessed food insecurity severity within the sample. Sayhoun et al. (2014) reported that the validity of the AFFSS in terms of item in-fits was 0.73 to 1.16 and was said to have strong convergent validity with the seven items in the food security survey. The scale was revalidated in this study and yielded a composite reliability alpha coefficient of 0.88 (Table 2).

f) Data Collection Procedure

The collection of data from the respondents was sequential as interviews were first conducted among the

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food manufacturing companies/government regulators before selecting the sample for the quantitative phase. The researcher wrote to the organizations and requested that they grant interviews regarding food security and interstate conflict. The researcher individually informed the interviewees about the research and what was expected of them.

For the quantitative phase, the researcher identified individuals who were most accessible and willing to be selected for the study. These individuals were purchasers of food items from the major supermarkets and shopping malls in Qatar with a majority of them in Doha. The researcher met with them individually and discussed the possibility of drawing them into the study. Some of the potential interviewees declined to be included in the study as they complained of lack of time, could not speak nor write in English, or simply declined without any specific reasons.

The total number of those recruited for the study in the quantitative phase was 143. However, the actual number of the respondents that was eventually selected was 119 with only one respondent whose data was invalidated due to incompleteness of the questionnaire. Therefore, the response rate was 83 percent. This was considered adequate for the study when taken against the actual number of participants recruited for the research.

In clear terms, the researcher informed participants individually through email messages that they must sign the electronic informed consent form before they were allowed to participate in the study. The electronic informed consent form was attached to the online survey questionnaire, which they needed to agree or disagree with the statements written in it before they could participate in the study. Confidentiality of information they gave to the research was guaranteed by ensuring that no third party had access to the data, which was stored online. The anonymity of the respondents was also important as it allowed the researcher to ensure that the identity of the respondents remained unknown and no information in the data could be traced to any individual in the study. Additionally, no mention of any individual was made in the final study output. This tended to make the survey low-risk in terms of ethical considerations and institutional review board (IRB) standards.

III. Focused Literature Review

Qatar food security risk has to do with its geo-climatic condition, which affects availability of water, arable land, and agricultural products. Therefore, the small peninsular country imports a large portion of its foods (Lambert and Hashim, 2017; Amery, 2019). The ships bringing food and food materials to Qatar must navigate through the checkpoint of Harmuz and Bab Al Mandab, a shipping passage that is of high risk and dangerous due to the activities of Somali and Iran pirates, as well as the threat from the Yemini war (Amery, 2019). It is a known fact that a country that relies on import is often at risk and "despite all achievements done so far by the Qatari policy makers, this relatively small oil monarchy is quite vulnerable in terms of food security" (Akkaş, 2018). And while Qatar generally ranks high on the Global Food Security Index, it remains highly dependent on food imports (Hassen and El-Bilali, 2019) "Based on its fiscal strength, the Qatari government adopted three important strategies: increasing local production, foreign agro-investments and long-term arrangements for food imports" (Hassen and El-Bilali, 2019).

Notably, the blockading countries alleged that Qatar had been supporting extremist groups while United States (US) military interests in Qatar made it difficult for the US to take a firm stance on either side (Billingsley, 2017). Qatar, meanwhile, denied all terror funding allegations and when they demanded proof of said accusations, none was produced (Ahmad, 2018). Other studies see the blockade of Qatar as being illegal relative to international legal norms (Khalaileh, 2019). "It could be argued that the economic sanctions imposed on Qatar produced a case of the unauthorized imposition of sanctions" (Khalaileh, 2019).

Syria, where some of the countries in the Gulf region used to import their fruit and vegetables, has been enmeshed in civil war since 2011. A study on economic sanctions imposed on Iran to leverage nuclear treaties concluded that this action violated the rights to health of citizens (Kokabisaghi, 2018). Other countries in the Gulf region, where Qatar was getting some of its food supply, have recently become a restricted area as these countries announced severing ties with Qatar in 2017 (Amery, 2019). Therefore, Qatar has been on the lookout for alternative means of securing foods for its growing population. As part of the effort to improvise, long before 2017, Qatar decided to purchase or lease some arable land in Ghana and Kenya. There is an unconfirmed report that a similar plan might be in the pipeline for Nigeria where there is sufficient arable land.

a) Conflict

According to Martin-Shields and Stojetz (2018), conflict is hard to define. For instance, the number of casualties is usually employed to distinguish between conflict and war. The Uppsala Conflict Data Program (UCDP) code is used in distinguishing between different types of conflict. For example, for a country to be considered at war, 1000 deaths that are related to battle must have occurred in the last year (Brück et al., 2019). Interstate conflict is defined as one country against another country whereas intrastate conflict occurs within a county with one party being the government while the other is an insurgent group (Pettersson and

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Wallensteen, 2015). Internationalized intrastate conflict is similarly defined as intrastate conflict but involves significant involvement of other states (Pettersson and Wallensteen, 2015). One-sided violence refers to conflict in which civilians are directly targeted by government or a group's force (Eck and Hultman, 2007). However, these definitions fail to define intrastate conflict where there is non-violent involvement from other countries. Recent global trends of different types of conflict (i.e., intrastate, interstate, internationalized intrastate, low intensity conflict, and one-sided violence) between the years 1996-2014 indicate that there is an increase in internationalized interstate conflict (Croicu and Sundberg, 2017). Unlike other types of conflict, the low rate of one-sided conflict is not considered a global issue for food security.

Non-violent conflict has been an area of social science research that has received scant attention from researchers (Goldstein, 2011; Pinker, 2011). Most extant research on conflict focuses on violent or armed conflict, because for decades violent conflict pervades the entire globe. This is especially true in the Middle East where there has been continuous violence or arm struggles between the State of Israel and Palestine as well as intrastate conflict involving the Syrian government and militia groups. However, recent studies of conflict show that there has been significant reduction in violent political conflict (Goldstein, 2011; Pinker, 2011). Non-violent conflict has mostly been identified among civil society groups (Chenoweth and Cunningham, 2013). There is need to differentiate between violent and non-violent conflicts. Nonviolent conflict can be defined as an act of avoiding armed action or physical violence due to "moral, philosophical, or principle of commitment" (Chenoweth and Cunningham, 2013). Reasons for the gap in the literature on nonviolent conflict may include definitional challenges, observational issues, and the problematic nature of measuring nonviolent conflict. The research that does exist on nonviolent conflict rarely involves the interstate context, focusing instead on civil society groups. This suggests the rise of more nonviolent means to achieve political outcomes (Bartkowski, 2013).

There has also been little research on cross-border conflict with most of this literature considered to be subjective efforts from western countries and the US (Strachan, 2017). These studies tend to dwell on religious extremism across certain borders either in Africa or between Africa and countries in the Middle East (GITOC, 2015). However, a study by The Global Initiative against Transnational Organised Crime (2015) indicates that there is a nexus between religious extremism, economic marginalization, and state repression. Cochalia (2015) indicates that the high level of cross-border conflict is motivated by economic marginalization and state repression. Cochalia (2015) was referring to intrastate conflict and conflict between borders caused by intrastate conflict. According to the ACLED (2016), the reporting of conflict trends across the border is not sufficient to provide meaningful insight about economic and political conflicts in Egypt and Sudan. However, this same report mentions that economic marginalization played a major role in the Sudan crisis.

Researchers have identified other variables apart from economic and political factors that may cause interstate conflict (Tadesse, 2012; The Economist, 2015). For instance, the water of the Nile is said to be the subject of conflict, cooperation, and strategy for conflict resolution and prevention among Nile riparian states like Egypt and Sudan. Other studies have shown that water has been a potential source of conflict between Jordan and Israel, while Egypt has been noted to be interested in South Sudan's wetland areas (South Sudan Independence, 2010; Haddadin, 2014). There is also evidence of inter-border conflict with respect to illicit drugs passing from Chad to Sudan and Egypt (Browne, 2013). However, the literature highlighted in this section fails to mention nonviolent conflict with economic and political blockades.

b) Food Security

Food security is defined here as a condition that occurs when all individuals, at all times, possess physical, social, and economic access to adequate safe and nutritious food in order to be active and healthy (FAO, 2017). According to the FAO, food security is classified into four distinct pillars: availability, access, stability, and utilization of food (FAO, 2017) each of which contributes to different dimensions of food security (Brück et al., 2019). Availability of food is about the presence of necessary calories (e.g., cereal versus protein from animals). Access defines the measure of facilities that are used in bringing food to the marketplace and the level of accessibility individuals have to calories per day (Brück et al., 2019). Food stability refers to the rate of dependence on food import, price differences in food domestically, and differences in land that is irrigated (FAO, 2017). Food utilization refers to ability of the people to make use of the calories that are available, which includes issues like stunting, low weight, and food waste among children (FAO, 2017).

Food insecurity can be challenging and complex as it can cause adverse conditions such as hunger, food scarcity, and malnutrition (Anuradha and Tilak, 2019). To prevent food insecurity, governments must ensure adequate food is provided for people through different strategies such as food subsidy, importation of food, growing food locally, and ensuring that appropriate foods with required vitamins and minerals are made available. Meeting food needs is not easy. For example, a study conducted by Hussain (2017) indicates that there is substantial wasting of food in Qatar with the country scoring significantly high in

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food waste. The study also links food waste to food insecurity. As of 2016, Western Asia, (home to Qatar), was rated 10.6 percent in terms of undernourishment (FAO, 2017). That value is relatively high and thus the region is considered a potential for food insecurity or food crisis.

Low-income countries top the list with 191.71 in depth of food deficit in 2014, and they accounted for 25 percent of the prevalence of undernourishment in the year under review. Those lower to middle income countries had a 97.88 depth of food deficit representing 13.95 percent of prevalence of undernourishment in the same year. The upper-income countries had 10.30 percent of the prevalence of undernourishment, while the depth of food deficit was 67.55. Lastly, those in the high-income group had 5.31 percent of prevalence of undernourishment and 22.16 of depth of food deficit (Martin-Shield and Stojetz, 2018).

c) Relationship between Cross-Border Conflict and Food Security

Prior studies have examined the link between conflict and food security and found that, in places where conflicts occurred, the households tend to have less access to food and less aid from others around them (Justino et al., 2013; Brück et al., 2016; Martin-Shields and Stojetz, 2018). A good example is the Gaza Strip where there is relatively limited access to food as the Israeli army only allows the residents of the Gaza Strip limited access to other areas and the entire population relies on aid (WB, 2015). Due to the ongoing, violent conflict in the Gaza Strip, the Israeli army allowed the residents to travel only a 100-meter distance in 2013 and 2014. The result of this restriction was a shortage of food and increased aid to the Palestinians in this area (PCBS and FSS, 2016). Martin-Shields and Stojetz (2018) examined the relationship between conflict and food security. These researchers found that violent conflicts contribute significantly to food insecurity in lower-income countries. They also report a causal relationship between food price volatility, prevalence of undernourishment, and violent conflict.

Food security is said to affect millions of people in the world with 19 countries identified by FAO that also experience conflict while most of these also suffer from a high level of food insecurity (Holleman et al., 2017). According to the report by the FAO (2017), on a global scale, it was reported that 60 percent of the 815 million children who suffer from malnourishment and 79 percent of the 155 million children who have stunted growth live in countries that are affected by conflict. Many countries that suffer from food insecurity are also low income and experience some type of conflict (Center for Systemic Peace, 2012). The reason adduced for this is that both civil conflict and food insecurity are correlates of poverty (Collier et al., 2003). Therefore, conflict is directly related to food insecurity. Increasing poverty due to lack of climate change adaptation in lower income countries is also a primary and rising cause of global food insecurity (Hallegatte et al., 2015).

Furthermore, grievances stemming from politics and economic conditions may also adversely affect food security (Ostby, 2008). An example of such conflict is the grievance between Qatar and some of its GCC members, which resulted in the economic and political blockade (sea, land, and air) of these same member states. The aftermath of this event was an increase in the prices of food commodities. Studies have shown that one of the signs of food insecurity is a sudden rise in food prices (Bellemare, 2015; Krishnamurthy et al., 2017). However, Bellemare (2015) notes that food prices may not actually increase due to conflict. For instance, the authors cited a situation where a reduction in social conflict led to a rise in food prices. In view of this, Bellemare (2015) concludes that levels of increase in prices of food, not vitality, are related to conflict. However, a further look shows that low-income households tend to spend more of their disposable income on foods, thereby suggesting a positive relationship between food prices and conflict (Mitchell et al., 2015). Additionally, "regional trade and labour have also taken a hit from the sanctions, with aluminum exports from Qatar temporarily blocked by the UAE, and migrant workers forced to return home or being barred from working in the Emirates." (Brown, 2017). Buigut and Kapar (2019) conclude that the blockade had an overall negative impact to the Qatar stock market. These kinds of broader contextual impacts can have a compounding effect to food insecurity.

d) Other Factors Affecting Perception of Food Security

Gengler (2019) analyzed Qatar citizen perception of the GCC before and after the blockade which, according to this study, point to the resilience of this population. "Just 18 months prior to the imposition of the blockade, in January 2016, 89 percent of Qataris held either a positive or very positive view of the GCC as an institution, compared to only 30 percent in May 2018" (Gengler, 2019). However, multiple factors can be attributed specifically to the issue of food security (Piguet, 2011; Bellemare, 2015). For instance, migration affects food security with the literature indicating that the number of people migrating to a specific country affects environmental degradation, such as climate change. This, in turn, inadvertently influences food security as a result of the activities of migrants (Fund for Peace, 2011; UNHCR, 2014). It was reported by Piguet (2011) that water scarcity in Africa might likely result in 250 million displaced refugees by the year 2020. A study by the United Nation High Commissioner for Refugees (UNHCR) (2014) also indicates that 2.3 million Somalia refugees were displaced in 2011 due to drought with the refugees fleeing to countries such as

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Kenya, Ethiopia, and Djibouti. This led to resource scarcity of food in those countries where the Somali refugees entered (Fund for Peace, 2011). Finally, it has been shown through this review of literature that conflict is a major factor contributing to food security in lower-income countries. Conflict is responsible for food price volatility and undernourishment in lower-income countries. In addition, low-income countries suffer significantly more food insecurity and thus have more prevalence of food deficit due to conflict.

IV. Data Analysis and Results

A statistical analysis was carried out on the qualitative data to derive the important themes that were used to complement the results of the quantitative research. The various themes were highlighted and connected to answer the research questions. For the quantitative analysis, descriptive statistics (percentage, frequency distribution and bar charts) and inferential statistics (independent t-test, multiple regression analysis, analysis of variance (ANOVA), zero order correlation) were employed.

a) Qualitative Results: Data Coding

The issues of transferability, conformability, and credibility have been shown to be critical in reporting the results of content analysis (Elo et al., 2014). Research literature shows that qualitative researchers should endeavor to systematically and clearly report their research findings while paying sufficient attention to the association between their data and the results (Elo and Kyngäs, 2008; Kyngäs et al., 2011). The results presented in this section were based on the data collected from the interview questions. This data was refined so that only those that complied with the stated objectives of the study and found to be relevant were coded as seen in Table 3.

Table 3: Coding and thematic analysis of interviewee responses to conflict and food security

Themes	Coding of Data (Interviewees' Responses)
Importation to complement local production	• Food materials are mainly imported from friendly countries • Local production has been step up to improve food sufficiency • Vegetables and other agricultural food products are now aggressively produced locally • Importation of food materials no longer from blockading countries
Qatar has adequate supply of food	• Qatar is working toward food sufficiency through increase in local production • Government is in cooperation with private companies home and abroad to increase production of foods • Soon Qatar will rely less on importation of food as efforts are ongoing to increase food production with modern technologies
Conflict has minimal effects on food security	• "The effects of the blockade on food security only took just two months or thereabout" • "Qatar is rich enough to provide for the needs of its people and expats even despite blockade" • Food prices have only gone up marginally due to the blockade • "Baladna cow farm is an unbelievable project"
Climatic condition	• Harsh weather, nature of soil, humidity, radiation, inadequate water, water temperature affects agriculture food production • Foods are grown locally by using hydroponic system, soil substitutes, fertilizers, cocoa peat • "Vegetables are mainly produced locally for now and later we intend to grow fruits • Vegetables and fruits were exported to blockading countries
What government should do in the conflict period	• Further liaise with the private sector to increase food production • Give free hands to private sector in agricultural matter • Will no longer source foods from blockading countries • Invest in food and increase natural wealth • Improve soil quality, reduce food waste, educate people on fishing, crop harvesting, provide leeway for farmers, increase technology use

b) Qualitative Analysis Based on Participants Responses

When the interviewees were asked about food production in Qatar, the majority indicated that the government was putting measures in place to improve local production of food as this is what can lead to food security. The interviewees from private food companies tended to be more direct, providing answers to the

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questions concerning local production of food by emphasizing lagging food self-sufficiency. Government regulators, on the other hand, preferred to talk about efforts the government is making to ensure more foods are grown locally. An important consideration here is that Qatar still relies significantly on importation for food, which makes the country vulnerable to food insecurity.

The interviewees insisted Qatar has an adequate food supply and that there was no period when there was food shortage in the country. According to one interviewee (restaurant owner in Doha), "…Qatar is rich enough to provide everything needed." This interviewee, however, agreed that there is still need for in-country production to be increased and the Qatari government is doing a lot to achieve this. Many of the respondents believed Qatar has adequate amounts of food due to the overall high-income level of the country which indicates that the constant food supply in Qatar is their assurance of food security. However, respondents did also mention that more needs to be done by the government and the organized private sector, especially in the area of food quality.

Regarding the effects of the lingering conflict in the GCC and food security, interviewees from the private sector indicated that the impact was minimal and that it was at the beginning of the conflict that there was a steep rise in cost of food products. They did admit during the interview that if Qatar had not moved swiftly that it was likely that the country would have experienced food insecurity. Those with the government food regulatory agency assessed the effect as minimal and did not see how food insecurity could be the result of the conflict.

Additionally, interviewees perceived the environmental climate of Qatar as a greater threat to food insecurity than conflict. However, respondents indicated that government is prepared for this threat by ensuring that the soil is rich enough for agricultural purposes. They also mentioned that there are other alternatives the public and the private sectors are providing to boost agricultural production. For instance, the Baladna cow farm project was mentioned as a unique case in point to produce fresh dairy products locally.

c) Quantitative Analysis: Results

The quantitative analysis was first conducted by considering the socio-demographic variables of the study. Demographic information of 119 respondents had been summarized in Table 4. To ensure that there is no issue of multi collinearity, a zero-order correlation test was conducted.

Table 4: Summary of respondent demographic profile

Demographic Characteristics		Frequency	Percent
Age	18-25 years	21	17.6
	26-33 years	29	24.4
	34-41 years	38	31.9
	42-49 years	20	16.8
	50-57 years	11	9.2
	Total	119	100.0
Gender	Male	66	55.5
	Female	53	44.5
	Total	119	100.0
Gender of household head	Male	94	79.0
	Female	25	21.0
	Total	119	100.0
Monthly household income	500-1000QR	2	1.7
	1001-1500QR	1	0.8
	2000-2600QR	7	5.9
	2601-3000QR	1	0.8
	3001-3500QR	5	4.2
	3501-4000QR	4	3.4
	4001-4500QR	6	5.0
	5000-5500QR	26	21.8
	Above 5500QR	67	56.3
	Total	119	100.0
Highest educational level of household head	No formal education	2	1.7
	Primary school	2	1.7
	Secondary school	6	5.0
	University	109	91.6
	Total	119	100.0

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Table 5 demonstrates the correlation between the variables of interest in this study. The analysis is presented to show that there was no issue of multi-collinearity as the variables have low to moderate relationships.

Table 5: Zero-order correlation involving the entire variables of the study, including household characteristics

S/N	Variables	1	2	3	4	5	6	7	8	9
1	Age	-	-.07	.02	.21	.01	-.12	-.03	-.10	.06
2	Gender		-	.24**	.01	-.11	-.08	.03	.11	-.01
3	Household head Gender			-	.22*	-.13	.10	.01	.07	-.10
4	Household income				-	.01	.07	.03	.11	-.05
5	Household education					-	.11	.04	.09	.03
6	Economic blockade						-	.47**	.41**	.17
7	Political blockade							-	.53**	.22*
8	Food security								-	.10
9	Interstate conflict									-

The first research question was "To what extent would interstate conflict affect food security in Qatar?" Table 6 shows there was no significant effect of individual belief about intestate conflict on their perception of food security in Qatar (t = -.16; df = 117; p>05). This result implies, therefore, that respondents who perceived low interstate conflict (Mean = 8.32) did not significantly report more belief about food security in Qatar than those who perceived high interstate conflict (Mean = 8.40).

Table 6: Independent t-test of the effect of interstate conflict on food security in Qatar

Variable	*N*	Mean	*SD*	*t*	SE	*P*	*Sig*
Low interstate conflict	56	8.32	2.50		0.33		
				-.16		.87	>.05
High interstate conflict	63	8.40	2.58		0.33		

The second question this study aimed to answer was "To what degree individual beliefs about political and economic blockades affect their perception of food security in Qatar?" Table 7 shows that individual beliefs about political and economic blockade conjointly affect their perception of food security in Qatar (F(2,118) = 26.14; Adj., R2 = 30; p =.000). = .20; t= 2.32; P=.05) were significant independent predictors of their perception of food security in Qatar. β = .433; t= 4.97; p =.000) and economic blockade (βThis result shows that individual belief about the political and economic blockade jointly accounted for 30 percent variance of their perception of food security in Qatar. Furthermore, both individual beliefs about political blockade (= .433; t= 4.97; p =.000) and economic blockade (= .20; t= 2.32; P=.05) were significant independent predictors of their perception of food security in Qatar.

Table 7: Regression of food security on political and economic blockade of Qatar

Model	*F*-Ratio	Sig of *p*	*R*	R^2	Adj. R^2	*β*	*t*	*p*
Political blockade	26.14	.000	.56	.31	.30	.433	4.97	.000
Economic blockade						.20	2.32	.022

The third and final research question was "To what extent would household characteristics, economic and political blockade jointly and independently affect their perception of food security in Qatar?" Table 8 shows that household characteristics, individual belief about the economic and political blockade were significant conjoint predictors of their perception of food security in Qatar (R = .570; R2; p = 0.000). This implies that 32.4 percent of the variance in perception of food security in Qatar was jointly accounted for by household characteristics and individual beliefs about political, and economic blockades.

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Table 8: Regression analysis showing the joint and relative prediction of household characteristics economic and political blockade on food security in Qatar

Variables	*F*-Ratio	Sig. of *p*	*R*	R^2	Adj. R^2	*β*	*t*	*p*
Age						.002	.022	.982
Gender						.100	1.219	.225
Household head Gender						.035	.415	.679
Household monthly income	6.603	.000	.570	.324	.275	.028	.322	.748
Educational qualification						.027	.323	.747
Interstate conflicts						-.038	-.459	.647
Economic blockade						.200	2.157	.033
Political blockade						.442	4.862	.000

V. Discussion

The results pertaining to the first research question showed that there was no significant effect of individual belief about interstate conflict on their perception of food security in Qatar. Some government regulators did acknowledge the inherent vulnerability to food insecurity in Qatar which is consistent with the literature review (e.g., Akkaş, 2018). And yet, respondents who had strong beliefs about interstate conflict reported slightly higher perception of food security, this difference was very small or negligible. This result corroborates the findings of the interviews, which showed that food suppliers and those who work for government in the food supply sector did not see the interstate conflict as having any meaningful effects on food security in Qatar. The likely reason for this result could be that the effects of the interstate conflict are no longer felt by the people due to the rapid response of the government immediately following the commencement of the economic and political blockades by the blockading countries. This aligns with findings from the Global Initiative Against Transnational Organized Crime (2015) which suggests that some interstate conflict may not have direct impact on national issues such as food security.

The results of the data analysis for the second research question showed that political and economic blockades both relatively and jointly predicted food security. This was the result obtained in the quantitative phase of the research. However, this contradicts the finding of the qualitative research, which indicated that the conflict only affected food security for a short while as there was sudden increase in the prices of foods and food materials. The finding is supported by the review of the literature and, particularly, Brück et al. (2019) who indicated that conflict between countries can have an impact on access to food. These authors explained that, when there is conflict, access to food decreases as conflict discourages manufacturing and supply of food materials in the impacted country. This dynamic may result in prevalence of undernourishment and an increase in depth of food deficit (Brück et al., 2019).

The results for the third research question testing the effects of household characteristics and political and economic blockades on food security revealed that all the factors jointly and significantly contributed to food security. However, when the individual contributions of the variables were tested, only political and economic blockades had significant effect on food security. Again, this result did not corroborate the results of the qualitative phase of the research, which suggested that the interstate conflict only had marginal effect on food security. The result of the quantitative phase is supported by the finding of Brück et al. (2016) and Justino et al. (2013) who suggest that conflict may influence food security.

VI. Conclusion

Food security is a function of political and economic issues with conflict playing some roles. When political and economic interconnectivity is friendly, food security is improved, but as political and economic issues become unfriendly, food insecurity tends to increase as a result of increase in prices of foods, poor access to food, and low availability of required dietary intake. Household characteristics alone cannot predict food security since other conditions such as conflict, inability to grow food locally, weather, political, and economic factors may also be a factor for food insecurity to be perceived.

The results showed that the individual perception of food security is influenced by political and economic beliefs, and to a lesser degree by the perception of conflict. The perception of food security is high in Qatar – with an uncertainty factor because of a high number of imports of food and agricultural goods. This is why the field of emergency and disaster management is considered critical in the country and it is indicated in the findings of this study that government should continue to seek and employ alternative means of providing foods for its growing population.

VII. Recommendations and Limitations

Based on the study results, it is suggested that more efforts are implemented to improve the food

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sustainability in Qatar. While the study revealed that there is no food shortage in Qatar, it was found that it is important to increase the quality of food. Therefore, the government should work towards improving food quality. Additionally, political and economic blockades were shown to have some relationship with food security most likely due to the prices of food items. In this regard, authors suggest the government should continue to work cooperatively with the private sector to increase local food production efficiency and output. This recommendation has global implications, particularly in the face of climate change (Hallegatte et al., 2015).

Household characteristics were not found to affect food security. However, efforts should be directed at improving the quality of food, reduction of food waste, encouraging more private participation in local food production, and investment in technology to make weather and soil amenable to growing agricultural products locally.

It is also necessary to point out that emergency and disaster management techniques should be included in the strategy to improve food insecurity resilience. For instance, the risks involved in importing foods are so high that constant emergency and disaster planning is required to ensure that sudden food insecurity is addressed opposite threats such as conflict or conflict where foods are being sourced.

Finally, this research had several limitations including:

- Due to time constrains only one of the seven challenges of food security was part of this study. Future research could target the remaining challenges.
- The respondents were not selected randomly, and convenience sampling method was used due to time constraints. The consequences of this are that the study is not able to represent the entire population.
- Future research on this topic should involve stratified samples as this may highlight the importance of household characteristics on food security.

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