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## Sustainable food security in the sultanate of Oman

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### Abstract

Food security is a complex, multifaceted issue influenced by culture, environment, and geographical location. Food security is built on four pillars such as food availability, food access, food utilization and stability in food. The purpose of this study is to exploit the sustainable food security to learn how and whether Oman characteristics influence food security. This study is based on exploratory research by reviewing available literature on food safety in developing countries. The government of Oman is realizing the importance of food security, and this is part of the national strategy. The study will help policy makers focus on more useful policy tools in their endeavor to maintain or improve production and distribution within their food systems, and better plan for the many challenges that could face the country. Oman is ensuring that its citizens have access to enough affordable, safe, and quality food. Farmers, consumers, and jobseekers could all benefit from a three-point strategy to give Oman food security. The government may need to increase investment in new technologies and innovations to ensure food security. Implementing an integrated natural resource management system to facilitate food security. We need collective action at the local level, as well as the participation of government and nongovernmental organizations that work at the community level, can make major improvements to global food security in Sultanate of Oman.

**Keywords:** Food Security; Sustainability; Food Access; Food Availability; Food Utilization; Food Stability

### 1. Introduction

The developing world has witnessed a significant growth in population and consumption demand. This growth, which is expected to continue for decades, would entail increasing pressure to overexploit natural resources and the inevitable limitation of people's ability to produce food (Bouchakour, et al., 2013). Achieving food security requires that the aggregate availability of physical supplies of food is sufficient, that households have adequate access to those food supplies through their own production, through the market or through other sources, and that the utilization of those food supplies is appropriate to meet the specific dietary needs of individuals (Mbage, 2013)

Many developing countries developing countries have not yet ensured sustainable food security. Global food security will remain a worldwide concern for the next 50 years and beyond (Rosegrant and Cline, 2003). Food is one of the basic human needs and its sufficient fulfillment is directly related to food security. The concept of food security in its historical process has been debated from various aspects, such as physical and economical access to healthy and nutritious foods, at all times. Food insecurity is considered as a complex policy problem with different aspects (Yamchi, et al, 2018). One of the goals of sustainable development is to meet society's food security needs without compromising the well-being and ability of future generations to meet their needs (Tapsir, et al., 2019). Food security exists when all people, at all time, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food

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preferences for an active and healthy life (FAO, 2008). While the world currently produces enough food for its citizens, hundreds of millions of people are undernourished (WHO, 2017)

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## 2. Rationale

The term “food security” has been used over time to describe food concerns in household and national level (Shaw, 2007). Over the past 50 years, the world has witnessed a dramatic increase in world population but an even greater increase in food production (FAO, 2018). Yet, the developing world population still suffers from undernourishment (Fan and Polman 2014). With a relatively high demographic growth, developing countries will see increased demand for food products, adding pressure to the food supply systems of these countries. The world is estimated to need up to 100 per cent more food by 2050 (Baulcombe et al. 2009).

The main food security question within poorer countries is whether to produce enough food sustainably. For the relatively rich, the question is the ability to produce or buy food sustainably. High-income countries (HICs) have the option to import food from cheaper sources, generally from countries with better production capabilities. However, even for the rich, food may not always be available. Food price volatility therefore means that countries that rely mostly on food imports incur greater price and supply risks. This is why one of the richest countries in the world, the UAE, ranked 23<sup>rd</sup> in the Global Food Security Index (GFSI 2022). Thus, food security threatens the poor and the rich. However, food security does not seem to be a problem for the most industrialized countries. It would be interesting, therefore, to assess the differential between the industrialized and developing countries and learn whether natural or social endowments are behind the differential in food security (Bouchakour, et al., 2013). Climate change will further affect the quality and safety of food, leading to the production of toxins in crops, for instance, and a worsening of nutritional value of cultivate food. According to Global Hunger Index report, climate change could reduce the concentrations of protein, zinc, and iron in crops, causing an additional 175m people to be zinc deficient and 122m to experience protein deficiency by 2050 (GHI, 2022)

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## 3. Purpose & Method

The purpose of this study is to exploit the sustainable food security to learn how and whether Oman characteristics influence food security. Such learning could hopefully help policy makers focus on more useful policy tools in their endeavor to maintain or improve production and distribution within their food systems, and better plan for the many challenges that could face the country. This study is based on exploratory research by reviewing available literature on food safety in developing countries. The researcher had discussions with a few authorities and food safety experts to understand the sustainability process in food safety.

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## 4. Literature

The Food and Agricultural Organization (FAO, 1996) considers that Food security, at the individual, household, national, regional and global levels is [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security is a complex, multifaceted issue influenced by culture, environment, and geographical location (GFSI, 2022). As per Global Food Security Index, Food security is defined as the state in which people always have physical, social, and economic access to sufficient and nutritious food that meets their dietary needs for a healthy and active life (GFSI, 2022).

Food security involves providing adequate supply, access and stability of food (Weber et al. 1988). Thus, food security is influenced by a multitude of factors, ranging from climate change (Gregory et al. 2005), to infrastructure, institutional environment and research. As Rosegrant and Cline (2003) point out: ‘Achieving food security needs policy and investment reforms on multiple fronts, including human resources, agricultural research, rural infrastructure, water resources, and farm- and community-based agricultural and natural resources management’. Food security can be seen from a demand-side perspective, where insecurity means the inability of people to purchase food due to, say, insufficient income or unemployment. The focus is on the supply side, where insecurity means the inability by the state to produce sufficient food sustainably and at affordable prices (Bouchakour, et al., 2013). Food security implies an individual has access at all times to enough food for an active and healthy life. Food security has numerous interrelated dimensions. Availability of food and access to food are the two most common defining characteristics of food security. Availability and access to food are affected by population growth, demographic trends, economic development, government policies, income levels, health, nutrition, gender, environmental degradation, natural disasters, refugees, migration, disease, and concentrated resource ownership (Stringer, 2001)

## 5. Four Pillars of Food Security

In its currently used form, food security considers energy, protein, and nutrient needs for a healthy life. It is built on four pillars (Committee on World Food Security, 2012) such as food availability, food access, food utilization and stability in food.



**Figure 1** Four Pillars of Food Security

**Food availability:** enough food available on a consistent basis. Food availability is determined by the level of food production, net trade, and food stock levels. **Food access:** sufficient resources to obtain appropriate food for a nutritious diet. Three elements can be used to describe food accessibility: affordability, preference, and allocation. Accessibility relates to economic access (i.e., food purchasing power), physical access (i.e., transport and infrastructure), as well as sociocultural access and preferences. Addressing concerns regarding food access means greater focus on food prices, incomes, expenditure, and markets. **Food utilization:** appropriate use based on nutritional value, food safety, and social value. Utilization is the result of feeding practices, food preparation, diet diversity, and fair intrahousehold food distribution. **Stability in food availability, access, and utilization.** Crises and shocks such as political instability, adverse weather conditions, or economic factors have an impact on long term food security (El Bilali, et al., 2019).

## 6. Oman's Position in Global Food Security

The Economist Intelligence Unit with consultation from a peer panel of experts every year conducting research and publishing the Global Food Security Index. The index provides a common framework for understanding the root causes of food insecurity by looking at the dynamics of food systems around the world. By creating a common framework against which to benchmark a country's food security, the GFSI has created a country-level food security measurement tool that addresses the issues of affordability, availability, and quality and safety of food in 113 countries around the world. The overall goal of the study is to assess which countries are most and least vulnerable to food insecurity through the categories of Affordability, Availability, and Quality and Safety. Affordability is defined as Measures the ability of consumers to purchase food, their vulnerability to price shocks and the presence of programs and policies to support customers when shocks occur. Availability is defined as Measures the sufficiency of the national food supply, the risk of supply disruption, national capacity to disseminate food and research efforts to expand agricultural output. Quality & safety is defined as Measures the variety and nutritional quality of average diets, as well as the safety of food (GFSI, 2022).

In the Economist Intelligence Unit (EIU)'s latest annual findings, Oman was categorized as showing "good performance" in ensuring that its citizens have access to sufficient amounts of affordable, safe and quality food. Oman performance is in the top tier of the 2022 Global Food Security Index (GFSI), placing 35<sup>th</sup> out of 113 countries. The country's best performance was in the affordability category with 88.6 score and achieving the full indicator rating of Proportion of population under global poverty line. Oman performed relatively well in the quality and safety, scoring 73.2 (GFSI, 2022)

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## 7. Food Security in Oman

According to Ministry of Technology and Communications, Oman was among the world nations at the UN Summit in September 2015 to recognize and adopt the Sustainable Development Goals, becoming one of the member states that agreed upon devoting all efforts to attain these goals. Thus, they were integrated into the main pillars of the Ninth National Five-Year Plan of the Sultanate. Zero Hunger is one of the 17 sustainable development goals of Oman. The focus of this goal is to end all forms of hunger, achieve food security, improve nutrition, give a special emphasis on the agriculture sector, and promote sustainable agriculture (SDG, 2019)

In 2008, there was a global food crisis, and that has created concerns all over the world for countries to positively move towards food solutions. In Oman, there is an opportunity and were well positioned to capitalize on this because we have an open sea, a good number of ports with access to markets, and we have access to sources of food, as well as arable land in various parts of the country. Food security has been at the heart of Oman's agricultural policy since the spike in global food prices in 2007-08. This focus has seen the government increase domestic production and thereby reduce its reliance on imports. One of the important sectors to be focused in 9th five-year plan of Oman is agriculture and fisheries. The Government of Oman is giving more importance by allocating more funds for agriculture and food related projects (The Report Oman, 2019).

With 45 million people in the GCC countries, these nations only produce 10 per cent of their own food needs. Oman's concerted plans to become a food-secure nation and provide locally grown produce for all who live in the Sultanate are well underway. That's the opinion of Saleh Al Shanfari, CEO of Oman Food Investment Company (OFIC), a state-owned organization set up to develop food security projects to reduce the amount of food Oman imports from overseas, while providing employment for talented people. According to Eng Saleh bin Mohammed al Shanfari, CEO of OFIC, the new projects will see investments in, among other areas, fish canning, agricultural logistics and marketing, food logistics, and for the first time, veterinary vaccine production as well. Total investments in the new projects, due to make headway this year, are in the order of RO 100 million (Industry Updates, 2019).

With the support of the Research Council, an independent R&D body established in 2011, a couple of key institutions are responsible for the bulk of the country's agricultural research, namely the College of Agricultural and Marine Sciences at SQU, MoAF research centers and the Diwan of the Royal Court. OFIC and Oman Global Logistics Group (OGLG) signed a memorandum of understanding to cooperate on enhancing the agriculture and fisheries supply chain, including focusing on R&D to improve the management of food security, and the development of food processing, storage and distribution clusters (The Report Oman, 2019).

Farmers, consumers, and jobseekers could all benefit from a three-point strategy by the Oman Food Investment Holding Company (OFIC) to give Oman food security. The three projects will integrate with existing activities within the framing societies, the purpose of establishing firstly the fruit and vegetable marketing company is to work very closely with the farmers, and the producing community, especially the agricultural growers and SMEs to make sure that there is proper collection, grading, distribution and packaging of the produce in the market. The second project is the food logistics company, this is a unique company. Currently, it is non-existent, there are multi-faceted logistics companies, but what we are planning here is to have a dedicated food logistics firm that specializes in handling food for proper code value changed, The third project which is the food techno park is a highly unique ecosystem that allows SME's and start-ups to have their own ideas, nurtured, mentored and guided in order to be able to begin their start-ups through an incubation phase which then allows them to grow into a full-fledged company that can compete in the global arena (Times News, 2019)

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## 8. Mechanisms for achieving food security in Oman

The Sultanate government, and the other GCC governments for that matter, has always emphasized the need to undertake agriculture in a sustainable fashion. Sustainable and ecologically sound agriculture guarantees the ability of farmers to continue producing food indefinitely in harmony with the biodiversity. Achieving sustainable agriculture in Oman would require policymakers (the government) to make choices – whether to expand domestic production while knowing that such a choice may put strain on scarce resources (Land and water) and is not sustainable, or whether to invest in improving land and water productivity in addition to taking advantage of opportunities presented by the world market (Mbaga, 2013).

The government may need to increase investment in new technologies and innovations to increase water availability, including water desalinization and wastewater recycling. Second, the government may need to create an environment

conducive for foreign investors so as to attract more foreign direct investments. More foreign direct investments will help create jobs and improve the incomes of the people, and hence the capacity to afford/access imported food commodities. Third, on prospects for expanding domestic production, food production in Oman and other GCC countries is limited by land and water scarcity. A final issue is to provide Oman people with family planning services and promote nutrition education. Promoting nutrition education will go a long way towards increasing food security by reducing demand for cereals. Currently, for example, while the average global per-capita consumption for wheat is 100 kg per annum, the average per-capita consumption in Oman is 115 kg. Reducing this to the global average could be possible (Mbagi, 2013).

### *Future Focus*

The policy makers can undertake some further research on the following focus areas to improve the food security in Oman.

- Implementing an integrated natural resource management system to facilitate food security.
- Increasing domestic food production, integrated with food chains business.
- Bridging the gap between growth population and food demand.
- Expanding agriculture & fisheries investment.
- Strengthening the capacities of food reserves and stores.
- Adaption an early warning system to stabilize international food price.
- Improving food consumption pattern.

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## **9. Conclusion**

Making substantial progress in improving food security will not be difficult. Food security in developing countries could be substantially improved by increased investment and policy reforms. The government of Oman is realizing the importance of food security, and this is part of the national strategy. As a result of the government's commitment to expanding fisheries and improving food security, the growth of Oman's agriculture and fisheries sector seems assured for the near-to-medium term. Oman did exceedingly well in terms of food safety net programs, ensuring the nation had enough food reserves and people all over the nation had good food accessibility. To implement innovation in food security, we need collective action at the local level, as well as the participation of government and nongovernmental organizations that work at the community level, we can make major improvements to global food security in Sultanate of Oman.

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## **Compliance with ethical standards**

### *Disclosure of conflict of interest*

We declare that there is no conflict of interest regarding the publication of this paper.

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