

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Tropical AgriSciences



**The Determinants of Household Food Security in
Palestine**

BACHELOR'S THESIS

Author: Salamin Maya

Supervisor: Ing. et Ing. William Nkomoki, Ph.D.

Prague 2022

Declaration

I hereby declare that I have done this thesis entitled “The Determinants of Household Food Security in Palestine” independently, all texts in this thesis are original, and all the sources have been quoted and acknowledged by means of complete references and according to Citation rules of the FTA.

In Prague 15 April 2022

.....

Maya Salamin

Acknowledgements

My acknowledgement goes to the Faculty of Tropical AgriSciences and the Czech University of Life Sciences faculty for the valuable information that I acquired during my academic career.

I wish to express my gratitude to my thesis advisor and supervisor, Ing. et Ing. William Nkomoki, Ph.D., for his patience, full encouragement, constant support, a wealth of knowledge, and motivation. Thank you for your great assistance and contributions over the last period; the time you've spent putting in much effort has been precious to me.

I want to give special thanks and appreciate my parents, Dr. Akram Salamin and Manal Zamarah, for their unwavering support and encouragement in guiding me to knowledge and the right track to a better future like my siblings Yara, Ayham, Rayan, and Mohammad.

Abstract

This study aims to analyze the food status in the West Bank and Gaza Strip and identify the factors contributing to variability in food insecurity. Data was gathered from Palestinian government sources and published statistical data, research papers discovered through queries in the Web of Science, Research Gate, and Google Scholar, and the statistical data from the World Bank, WHO, and FAO. Palestine experienced a critical expansion in food-insecure individuals during 2014, with 1.6 million individuals. The most significant increase was in Gaza, about 60% of the populace, which continued to ascend to 68%. Palestinians have moderate poverty measured at a rate of 30% in 2017, while the highest undernourishment rate at 2118 Kilocalories per capita per day in 2019. The study revealed that some of the prominent factors contributing to food insecurity in Palestine were conflict, climate change, water insecurity, and poverty.

Keywords: Food security, consumption, factors, Palestine, West Bank, Gaza

Contents

1. Introduction	1
2. Aims of the Thesis	3
3. Methodology	4
4. Literature Review	6
4.1 Background of Palestine	6
4.2 Palestine Economy and Livelihood	6
4.3 Food Security	9
4.3.1 Food Security Dimensions	10
4.3.2 Food Security in the Middle East	11
4.3.3 Food Security in Palestine	13
4.4 Factors Affecting Food Security in Palestine	19
4.5 Prominent Factors Contributing to Food Insecurity in Palestine	31
4.5.1 Conflicts	31
4.5.2 Poverty	33
4.5.3 Climate Change	34
4.5.4 Water Security	37
5. Conclusions	40
6. References	42

List of tables

TABLE 1: THE FACTORS THAT INFLUENCE FOOD INSECURITY IN PALESTINE.....	20
TABLE 2: PRODUCTION, YIELD, AND AREA HARVESTED OF PALESTINIAN AGRICULTURE 2018	35

List of figures

FIGURE 1. MAP OF PALESTINE	4
FIGURE 2. REAL GDP IN PALESTINE (1994-2015).....	8
FIGURE 3. NUMBER OF SEVERELY FOOD INSECURE PEOPLE.....	11
FIGURE 4. FOOD SECURITY IN PALESTINE (2014-2018).....	14
FIGURE 5. FOOD INSECURITY- WEST BANK, GAZA, AND PALESTINE	16
FIGURE 6. THE PREVALENCE OF UNDERNOURISHMENT	17
FIGURE 7. AVERAGE DIETARY ENERGY SUPPLY ADEQUACY	18
FIGURE 8. PER CAPITA FOOD PRODUCTION VARIABILITY	19
FIGURE 9. PARTITION OF THE MAP OF PALESTINE (1946 - 2011)	32
FIGURE 10. PERCENTAGE OF POVERTY RATES IN PALESTINE.....	34
FIGURE 11. AVERAGE ANNUAL RAINFALL (1981-2010).....	36
FIGURE 12. TOTAL WATER WITHDRAWAL PER CAPITA IN PALESTINE AND ISRAEL	39

The abbreviations used in the thesis

FAO - Food and Agriculture Organisation

GDP - Gross Domestic Products

WB - World Bank

WMO - World Meteorological Organization

WHO - World Health Organization

FAO - Food and Agriculture Organization.

PCBS - Palestinian Central Bureau of Statistics.

PA - Palestinian Authority.

UNRWA - United Nations Relief and Works Agency for Refugees.

UNICEF - United Nations International Children's Emergency Fund.

BBC - British Broadcasting Corporation.

PLO - Palestine Liberation Organization.

WFP - World Food Programme.

OCHA - United Nations Office for the Coordination of Humanitarian Affairs.

HR - Human resources.

1. Introduction

Food insecurity is accomplished when a nation creates all of its essential food needs or gets it from abroad under any state of high global food costs. Palestine can not get all of its food needs, especially fundamental food varieties like wheat, bread, meat, poultry, and vegetables and can not get basic food needs from abroad without help or gifts. In the absence of sufficient and safe food consistently and under monetary and financial circumstances, roughly 33% of Palestinians have been not able to acquire adequate and safe food always (State of Palestine 2018).

Poverty, gender inequality, water insecurity, political, economic, and social instability, and climate change impede food supply and accessibility and are projected to decrease. Food security in the West Bank and Gaza Strip is disrupted due to the Palestinian-Israeli conflict. Due to land compulsory acquisition and control of water sources and the loss of farmland and vegetation during the conflict (Khalidi 2011).

According to Tabar (2020), climate change and ecosystem disruption have vulnerable Palestine's agricultural wealth. High temperatures, flood and drought rates, and rainfall distribution rates all pose a clear threat to crop production in the country, preparing food provision a challenging contest. Climate change, such as higher-than-average temperatures and less rainfall, resulted in a significant decline in the West Bank's olive yield. Non-governmental categorized Palestine's agricultural condition reported that the olive cultivation in the West Bank amounted to around ten thousand tons in 2018, accounting for half of the annual production rates of more than twenty thousand tons. As long as olive yield accounts for roughly half of total agricultural production in Palestine, and approximately 100,000 families rely on it for a living.

From 2006 until now, the combination of the Palestinian National Authority's economic crisis and crossing closures has resulted in a quick acceleration of poverty, expansion in market costs for actual food products, a basic weariness of commodity systems, and critical exhaustion of export strategies. These patterns thus prompted a sharp increase in food instability, which winds up expanding the accreditation of the food program recipients (World Food Program 2019).

The study problem identifies that in Palestine, the extended and progressing conflict joined by economic stagnation, regional trade, and challenging access to resources, alongside massive unemployment and poverty levels, stay significant natural barriers to accomplishing Sustainable Development Goal 2 (SDG2), pointed toward eliminating hunger, achieving food security, and further improve nutrition. With nearly a quarter of the populace unable to purchase nutritious food (32.7 percent, or 1.6 million people), humanitarian assistance supports forestalling a further crumbling in food security. Food insecurity is common among women, with 32% of female-headed households experiencing food insecurity, particularly in the Gaza Strip, 54 percent (WFP 2020a).

The significance of the study appreciates the ascent in the pace of food insecurity and the seriousness of the negative consequences on the determinants of food security that affect the drawn-out occupations of small-scale farmers and Palestinian households. Attention to the social and monetary circumstance and food security of agrarian households by expanding creation through improved and created administration of farming assets such as soil and water and advancing their utilization is vital. The study aims to examine the case of food security in Palestinian households and contribute to a better understanding of crucial and demanding topics that influence the increase of food insecurity in Palestine.

2. Aims of the Thesis

The main aim of the thesis is to understand the food security situation in Palestine.

Specific objectives

1. To assess the prevalence of food security in Palestine.
2. To identify the factors that influence food insecurity in Palestine.

3. Methodology

This study evaluated the food security crisis to address the most significant factors that impede efficacy. The study area is shown in **Figure 1**. The Dead Sea and Jordan surround the West Bank on the East, Israel to the North, the Gaza Strip to the Southwest boundary.



Figure 1. Map of Palestine: source: The world map (2021)

The principle wellspring of information utilized in this research are governmental sources of Palestine and published statistical data, research papers (found through queries in the Web of Science database, Research Gate, and google scholar), assessments and statistics from the World Bank Group, World Health Organization and food and agriculture organization (FAO). These databases assisted in measuring the position and guiding out the actual conditions and contributed to a better understanding of Palestine's current food security situation and its influences.

Food security data, and information provided on Palestine, were as follows; i) food energy supply, ii) average food energy supply adequacy, and iii) share per capita of food production was collected from FAO and the World Bank. Given that Palestine is not considered a state in the true sense, but rather two territories that were recently declared Gaza Strip and the West Bank, it was hard to gather numerous data regarding Palestine and its food security.

The data was gathered by finding articles and studies about food security in Palestine and the factors that influence it. Food security factors were assessed from thirty (30) articles published between the years 2004 to 2020 to measure the relationship between independent factors (conflict, climate change, water security, poverty, hunger, financial assessment and aid, gender inequality, urban agriculture, and environmental degradation) and unstable factors including (COVID-19 pandemic, advanced technical tools, increment of food prices, economic growth, agricultural output, renewable energy resources, and Israel assault and displacement).

The study focuses mainly on the various relevant survey results revealed by the Palestinian Central Bureau of Statistics (PCBS). It depends on a few Israeli statistics in a relatively simple way for the aim of boosting the research despite not covering a large amount of data about the Palestinian food insecurity are accompanied by political reasons and to cover the influencing factors due to the occupation and the fact that most of the data were not collected from the start and unusual for documentation for the past decades. In addition to the fact that this data was frequently withheld for political purposes.

For the analytical approach, descriptive statistics were used for this study.

4. Literature Review

4.1 Background of Palestine

According to Wafa (2022), Palestine is a coastal region in the Middle East that overlooks the Mediterranean Sea, including East Jerusalem, which Israel has forcibly annexed. The north of the equator stretches from latitude 29 to 33 North and longitude 35 to 39 east. From 1967 to the present day, the area of Palestine (both the West Bank and the Gaza Strip) is approximately 6,020 km². From 1993 until today, after (Nakba) in 1948, an imaginary line was drawn, the Green Line (the armistice line between Israel and the Arab armies in 1949) was officially documented after the Oslo Accords. Its current population is 5,292,315 people (Worldometer 2022).

With Israel's occupation of Palestine for more than 50 years, Palestinians live in fragmented areas of Palestine, including East Jerusalem (which belongs to the Palestinian Authority under the Oslo Accords) and the Gaza Strip (which is completely besieged by the occupation), as well as Area C in the Palestinian Authority-controlled West Bank. A and B are entirely under Israeli occupation control (Lockman 2005). After the Israeli occupation, Palestine was divided into three parts. The most significant part is considered the lands of the new existing state, Israel, and the part is completely besieged by the occupation (Gaza), and the third part is regarded under the Palestinian Authority, but it is subject to the control of the occupation (Hanlie 2008).

4.2 Palestine Economy and Livelihood

In 2019, the gross domestic product increased by about 0.9% compared to 2018 at constant prices, meaning that the Palestinian economy maintained stable growth despite the financial crisis that befell the economy, which witnessed the detention of clearing funds for more than six consecutive months, as it increased in the West Bank by 1.2% against stability in Gaza Strip in 2019 compared to 2018 (Palestinian Central Bureau of Statistics 2020).

According to the statistics of the World Bank, the gross domestic product in Palestine in 2019 amounted to 17.13 billion USD, compared to 2018, in which the gross domestic product was 16.28 billion USD, where the remarkable increase appears (World Bank 2021).

The Palestinian economy recorded a sharp decline of 11.5% in 2020 compared to the previous year. It reached 15.56 billion USD (World Bank 2021); the decrease was due to the impact of the new Coronavirus (Covid-19) and its repercussions. During the first quarter of 2020, a state of emergency was declared in the West Bank. The second quarter of 2020 witnessed an increase in the severity of comprehensive closures and an almost complete cessation of economic activity (Arabic news 2021).

The Palestinian economy experienced an economic crisis during the second intifada (2000-2004). **Figure (2)** shows the gross domestic product between the years (1994 and 2015) due to the Israeli government's reaction by imposing severe restrictions on movement within and outside the country (World bank 2022). All of its exports and imports included restrictions on movement even within the state borders. As a result, the percentage of Palestinians working in the Israeli sector decreased significantly (from 26 percent to 11 percent at the end of the second intifada), and the GDP fell from 4336 million dollars (2000) to 3441 million dollars (2002), leading to an increase in the unemployment rate from 12 percent to 23 percent (2004) (GISHA 2021).

In the West Bank, the GDP started to improve after Israel eased restrictions on the sector. When Israel tightened the siege on the Gaza Strip in 2007, establishing a comprehensive blockade on the Strip, the economy was unable to increase or recover, which was accomplished by reducing the permitted fishing area, limiting the movement of goods to and from the Strip, and prohibiting Palestinian workers from working in Palestine. One of the main reasons for not collapsing the entire sector was the smuggling of goods, but the living conditions were deteriorating due to the continuous destruction of thousands of homes, public facilities, factories, and other structures as a result of the attacks that occurred over the years (2008, 2012, 2014, 2018 and the recent war which was in 2021 (PCBS 2022a).

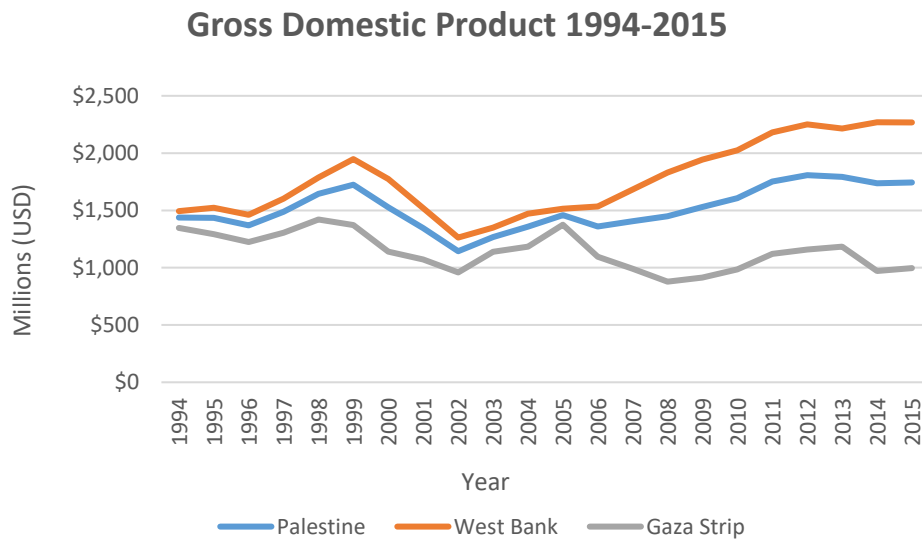


Figure 2. Real GDP in Palestine (1994-2015): source: PCBS (2017)

The Palestinian Authority is the largest employer (State of Palestine 2014). United Nations Relief and Works Agency for Refugees (UNRWA, 2020) is primarily responsible for the employment of Palestinian refugees and the diaspora and the distribution of needed food (United Nations 2014). UNICEF is concerned with providing the children’s needs, medicines, and items (Unicef 2021).

In Palestine, the annual rainfall is 511 mm, and the mean yearly temperature remains 24°C; July is usually the warmest month of the year, with an average temperature of 31°C. January is typically the coldest, with a mean temperature of 15°C. Palestine’s geographical location contributes to the climatic disparity between its northern and southern parts. The central and northern cities are ideal for summer resorts, while the warm southeastern and south towns are ideal for picnics, one of the motivating factors for the Palestinian tourism industry (World Bank 2021).

The West Bank and Gaza Strip support the survival of the Palestinian people on their land, which is presented in the UN report (United Nations 2014). Non-Governmental Organizations are concerned with helping farmers reclaim and cultivate their lands and empower Palestinian women to join the labour market (Arab org 2021). Agriculture occupies a good part of the labor force.

However, Palestine's continuous loss of lands, whether through confiscation or urban sprawl, has led to the shrinkage of agricultural areas and the emergence of many crafts and non-professional human resources to secure the minimum level of family spending and food security. Olives are ranked first place with 84.6% of the fruitful crops in the West Bank. The field crops include wheat and barley in the plain areas and the mountains of the West Bank, and some seasonal fruits and vegetables, which are planted in greenhouses during the off-season, especially grapes in Hebron, bananas and dates in Jericho, citrus fruits and roses in Gaza (Abdelrahman, 2021).

There are two primary sources of food available in the Palestinian market: local agricultural production and imports, which have played a more critical role in meeting Palestinian food needs in recent years, despite the many trade restrictions imposed by the occupation. The main factors that determine and control the increase in productivity in Palestine are those related to the conflict with Israel and the economic conditions in agriculture since the low dependence on agriculture in Palestine and the high reliance on imports increase the risk of shocks, such as price fluctuations (khalidi 2011: Lockman 2005).

4.3 Food Security

Food is any nutrient-dense material that humans, animals, or plants consume or absorb to sustain life and growth. Food and Agriculture Organization of the United Nations defines food security as providing physical and financial admittance to adequate, safe, and nutritious food varieties for all individuals consistently and guaranteeing accessibility and dependability of food supplies. Availability, Access, Utilization, and Stability are the four main components of food security (FAO 2003). Gustafson (2020) characterized it as the availability of individual food access. Families are viewed as food secure when they are not presented to hunger and are not scared of passing on from starvation, as developing countries suffer from rapidly deteriorating conditions.

4.3.1 Food Security Dimensions

The first dimension is food availability is described as individuals or households having easy access to the food they require without difficulty. Food is present and created at the local level of the state, and sufficient amounts of good quality food are available for the state's members. The food could be produced personally or purchased from domestic food stocks (Policy Brief 2006; Global Food Security Index 2021)

The second dimension is food access at the individual or household level. It depends on individuals' resources and ability to maintain and prioritise food expenditures. Some options include producing food on one's own, purchasing, borrowing food, and receiving food assistance. There may be a link between access to food and the general situation of the state if, in the case of natural disasters or wars, the production of a particular product in the country decreases for specific reasons, causing a price increase that burdens the individual to purchase it (Leroy 2015).

The third dimension is food use or utilization at the individual level. The nature of the body determines the quantity, quality, and type of food consumed, how it is prepared, the approved diet, and the health and cleanliness of the water (FAO 2021). There is a positive relationship between the efficiency of food use for growth with the size and age, and the efficiency increases asymptotically as food intake increases (Shelby 2022).

Stability is continuous access to food that people require (temporal stability of food security). It is directly impacted by income, communication gap, difficult-to-reach roads, and economic, political, climatic, and social factors, among other things (Sablani 2005). The significance of sustainability in preserving the environment, Agro-ecosystems, and natural resources has been emphasized by intergovernmental activities. (Timmer 2012; Berry et al. 2015).

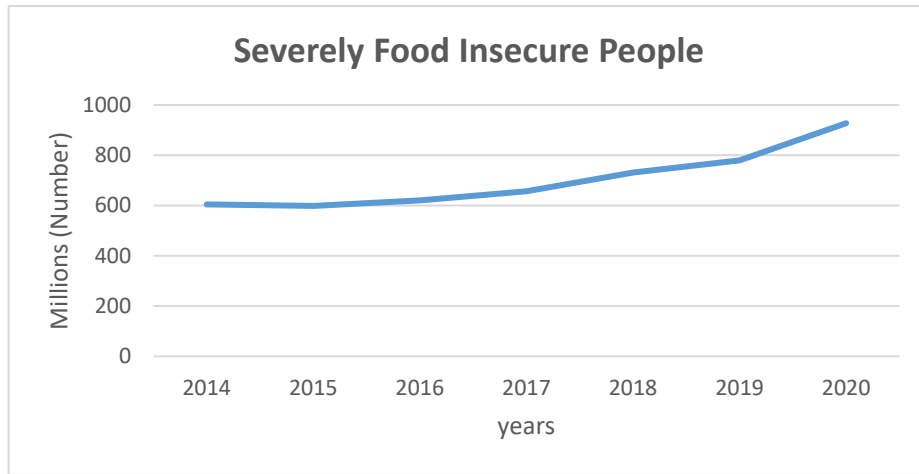


Figure 3. Number of severely food insecure people: source: FAO (2021)

4.3.2 Food Security in the Middle East

As per (Global Food Security Index 2019), in the Arab world, Qatar positioned first with a food security index of 81.2%, positioning thirteenth universally, trailed by the UAE, 76.5%, and 21st internationally, then Kuwait at 74.8%. The Middle East can likewise be characterized as all Arab nations comprising 14 nations and four non-Arab nations like Turkey and Iran, as it is situated between the four water collections of the Persian Gulf, the Arabian Sea, the Red and the Mediterranean Sea. Food security in the Middle East is not considered in the best circumstances. In contrast, per the measurements of the World Bank, the food security in both the Middle East and North Africa (MENA) (Al-Awsat 2021). Fifty-five (55) million individuals endure undernourishment out of a populace of 456.7 million and almost 20% of its people; the reasons return first to the conflicts like Syria, Yemen, Libya, and Sudan. In addition to mismanagement, extreme atmospheric conditions, protracted conflicts, and economic crises, alongside the Covid-19 pandemic, obliterated the worldwide economy overall (World Bank 2021).

As expressed in Abdelnour et al. (2021) for the Middle East specifically, the explanation of undernourishment for an enormous extent of individuals is that the nations of the Middle East, albeit wealthy in natural resources and plentiful in oil and mineral resources, are regions that experience the ill effects of the absence of water, dry land and soil issues, large numbers of the nations of the East. The Middle East is hard to cultivate in, as it is viewed as one of the most bringing in nations for food grains (wheat, corn, soybeans, and so forth). It is constantly affected by price volatility; for example, in Bahrain, the United Arab Emirates, Oman and others, the increase in market prices prompts the spread of poverty and the expansion of families that can not get what they need. Yemen is positioned eleventh on the planet in terms of undernourishment, as 7 million of the populace experience the ill effects of the absence of food out of 21 million individuals, which implies 30% are undernourished (Katkhuda 2020).

As revealed by Economic (2019), one of the fundamental purposes behind the food insecurity in Yemen was the enormous utilization of springs and deep fossil groundwater, which prompted a lack of grain creation and the import of almost 80% of grain creation. Concerning Saudi Arabia, which is certifiably not a horticultural country by any means, where the level of developed land is 3.2% of the state's territory, desalinating ocean water was extravagant, as rural land was leased and bought in different nations, for example, Ethiopia and Sudan, which is viewed as perhaps the most country endure of undernourishment. Concerning Iraq and Syria, the abatement in the progression of the Tigris and Euphrates waterways prompted the takeoff of vast areas of horticultural land from administration and the suspension of many water siphoning stations for drinking or water system in numerous places because of the distance of the stream course from them, where Aleppo Governorate relies upon enormous areas of rural land on water Euphrates River and for drinking water (BBC News 2021).

The expansion in the number of exiles and inside dislodged individuals looking for a better life and a future for themselves and their families (FAOSTAT 2021) recorded multiplying the number of evacuees to 64 million individuals somewhere in the range between 2007 and 2016. occurred in Syria, which has been at war for around a decade, driving 5 million individuals to look for asylum outside their nation and 6 million individuals to be uprooted from their homes (FAO 2021). Yemen has been at war for a long time and has 7.3 million individuals, with 75% kids and women.

These individuals are either dislodged because of the continuous conflict or poor, cannot give lodging or food, and rely on an aid and backing (Jeremy 2019).

4.3.3 Food Security in Palestine

As indicated by UNRWA (2014) insights, as in the West Bank, that happened in (2013) around 19%, which relates to 1.6 million individuals experiencing food insecurity. In Gaza, it is the more significant part of individuals, 57%, regardless of how the Palestinian populace in Gaza and the West Bank spends half of its pay on food acquirement. The justification for the high poverty rate, particularly in the West Bank, is unemployment and the absence of open positions, albeit most Palestinians have authentications that qualify them for suitable positions, as well as the increment in food costs because of the monetary shocks that hit Palestine occasionally because of wars and clashes, environmental change and others.

In Gaza, less than 80,000 Palestinian refugees get social help from UNRWA (in 2000), and more than 1,000,000 individuals rely upon crisis food help and can not survive without it (UNRWA 2019). This is a consequence of the blockade that resulted in Gaza's closure, the successive conflicts that have destroyed the infrastructure and cost numerous residents their lives, and the Palestinian political crisis that started in 2007 with the election of Hamas to control Gaza. Likewise, Gaza has a high unemployment pace of 40.8 percent (UNRWA 2014), compared to around 180,200 jobless individuals (UNRWA 2014).

The most significant social affair in the West Bank and Gaza Strip supports the endurance of the Palestinian individuals on their territory, which is addressed in (United Nations 2014). As per the State of Palestine (2014), The Palestinian Authority is the most significant business supplier, and they pay salaries that empower employees and their families to get food. Furthermore, the United Nations Relief and Works Agency for Refugees (UNRWA, 2020), came about because of Palestine's occupation and the Palestinians' displacement and is fundamentally answerable for the work of Palestinian exiles and the dissemination of different kinds of food for them. (United Nations 2014),

UNICEF, likewise one of the results of Palestine’s occupation, provides the children’s necessities (Unicef, 2021). NGOs are worried about aiding cultivators recover and developing their properties and enabling Palestinian women to join the work market (Arab org 2021). Also supporting some Arab nations, the European Union and the United States because of the political arrangements endorsed between the Palestine Liberation Organization and Israel (United Nations, 2014).

To this effect, the first specific objective was to examine the food security status in Palestine by using the measures presented.

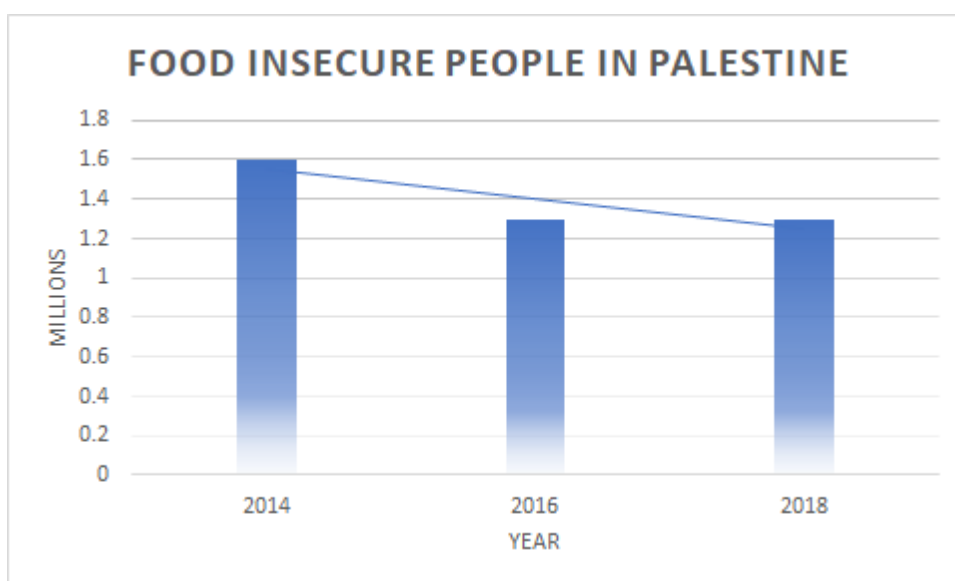


Figure 4. Food security in Palestine (2014-2018): source: FAOSTAT (2021)

Food insecurity is more pervasive in the Gaza Strip, achieving 59 percent, more than three times the level in the West Bank with 15 percent. Food insecurity rates remained unchanged in 2014 when compared to 2013 and 2012. High insecurity rates are considered Food insecurity from 2012 to 2014 contrasted with an improvement in 2009-2011 when the level of food insecurity in Palestine fell to 27 percent (WFP, 2020).

Despite development in food insecurity among refugees in the West Bank (fell from 23 percent to 20 percent), these rates remain significantly high among refugees than among non-refugees (20 percent for refugees and 19 percent for refugees non-refugees). Food insecurity appears to be greater in West Bank refugee camps than in urban or rural areas.

In the Gaza Strip, refugees continue to have a higher level of food security than non-refugees (54 percent of refugees, 63 percent of non-refugees), owing to support offered by the UN and other institutions (PCBS, 2014).

The blockade of the Gaza Strip, which has been in place since 2007, continues to suffocate the economic growth and prevents any healing in other, more key sectors. The economic situation deteriorated in 2013 following the closure of the irregular tunnel trade, which signifies that the low-cost goods coming from Egypt via the tunnels have been replaced by the more costly items passing the Gaza Strip across Israel via the legal crossings. Furthermore, the limitations on importing materials for construction put a strain on employment, with the unemployment rate reaching 40.8 percent in the first quarter of 2014, or approximately 180,200 people, the highest throughout the last five years (OCHA, 2015).

The Palestinian territory's unemployment rate has also risen in recent years, approaching 32% in 2018. The unemployment rate has officially hit 55% in Gaza, the greatest ever measured. Sixty-two thousand of the 244,000 population registered as "have jobs" are public sector employees on the PA's payments, whose incomes have been reduced since March 2017. Since 2014, another 22,000 employees appointed by Hamas authorities have been receiving their incomes irregularly. Some of these employees received their August salaries from Qatari funding in November. During the second half of 2018, the unemployment rate among males exceeded 70% and achieved an even greater rate than females, achieving 78 percent (Harakati 2018).

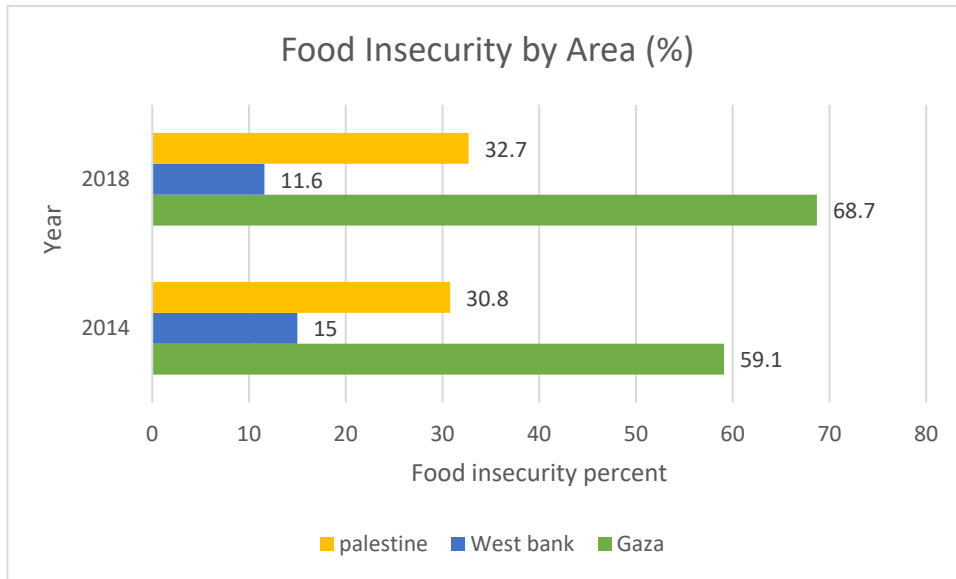


Figure 5. Food Insecurity- West Bank, Gaza, and Palestine WFP (2020)

4.3.3.1 Undernourishment

(Massad et al. 2016) looked at pregnant and lactating women and children under the age of five are more vulnerable to nutritional delays related to the Palestinian people's undernutrition and obesity due to a lack of many nutrients. Anaemia affects 31% of pregnant women, 29% of lactating women, and 26.5 percent of children, and these groups are deficient in vitamin A, B12, vitamin D, and vitamin E.

Poverty, unemployment, and food insecurity in the Gaza Strip, combined with the recent 23-day Israeli offensive, have caused an increase in undernutrition indicators, including increased cases of stunting, wasting, and underweight in children and continued high rates of anaemia among children and pregnant women. Children's health practices deteriorated due to a consistent electricity supply shortage since the early part of the attack, particularly during the conflict, when citizens reported that this forced them to reduce regular cleaning and personal hygiene (Gaza city 2009).

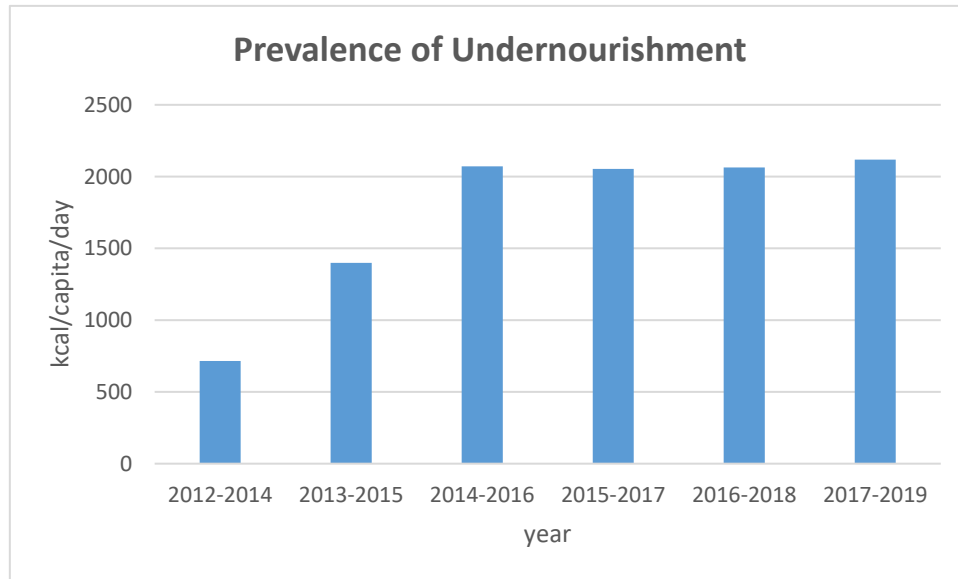


Figure 6. The prevalence of undernourishment: source: FAOSTAT (2021)

4.3.3.2 Dietary Energy Supply Adequacy

FAO (2005) confirmed vegetable goods make up the majority of the food supply. In 2000/02, meat and dairy provided about a third of the lipid and protein supply but just 13 percent of the energy supply because of the scarcity of animal foods, vitamin A, iron and calcium supplementation and/or bioavailability.

According to Kanafani and Botmeh (2008), Since September 2000, strict limits on the mobility of people movement increased unemployment and wages, and the ruination of financial assets has significantly influenced food security. The dietary energy supply is appropriate nowadays, primarily vegetables, fruit, and cereals, but the state heavily relies on cereal imports. The diversification of the diet is increasing as a result of urban development.

Dietary energy supply, micronutrient intake distribution, and food production diversity, the dietary energy supply per capita/day was 2 186 kcal (2000). The proportion of macro and micronutrients in the total nutritional energy supply was 65 percent for carbohydrate consumption, 11 percent for protein, and 24 percent for lipids. Compared to other products, the latest lipid rate is appropriate for energy (WHO 2020).

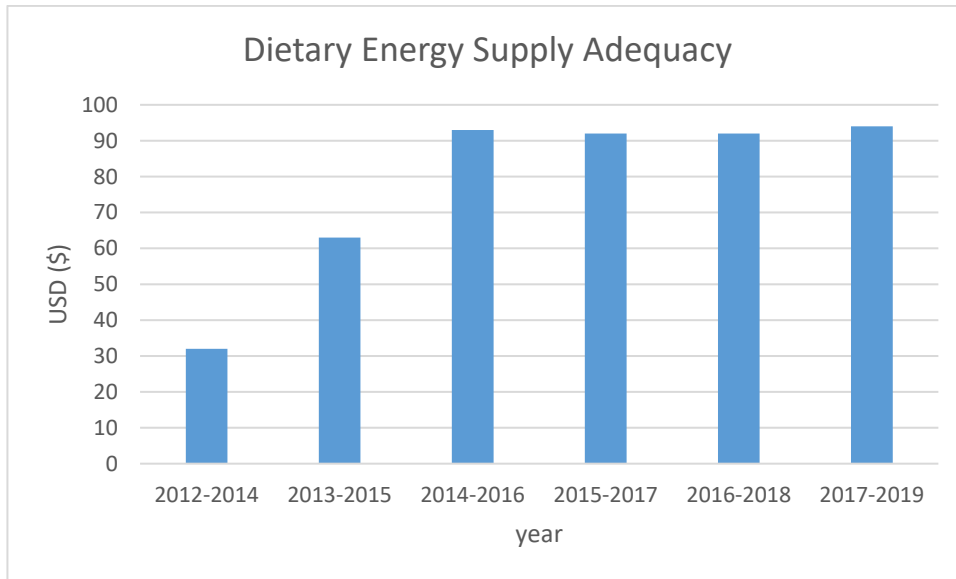


Figure 7. Average dietary energy supply adequacy FAOSTAT (2021)

4.3.3.3 Food Production Variability

Findings from the research by Albaba et al. (2018) An examination of agricultural production and its activities reveals that the sector faces numerous problems and barriers. The Palestinian political crisis has been the most serious. Climate change has been a critical challenge confronting the Palestinian agricultural sector and seriously affecting farm productivity, the light of changes and volatility in rainfall amounts, as well as the dissolution of agricultural investments, which reduces productivity, effectiveness, and profit growth.

Figure 8 shows that it was in somewhat good condition and began to diminish slowly, then, at that point, increment partially and afterwards return to diminishing, for several reasons, including the powerlessness to keep up with standard food utilization and not contemplating how to get food the following day, inability to adjust to the request. The need is for their whole food and different necessities, and a vast number of families are experiencing a severe consumption gap and a lack of capital and unemployment (Kanafani 2012).

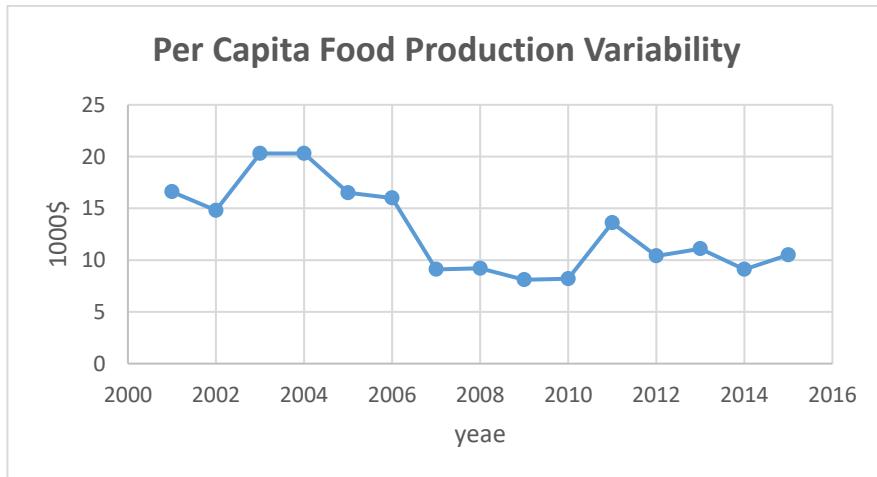


Figure 8. Per capita food production variability -FAOSTAT (2021)

4.4 Factors Affecting Food Security in Palestine

Many factors affect food security negatively and positively. As per Ahmad (2021), several organisations provide food stability for the Palestinian population. However, the aid is subject to political considerations that can improve or worsen depending on the conditions, especially from the U.S. and Israel. The U.S.-Israeli financial blockade on international organizations makes it challenging to estimate the Palestinian territories' accurate and organized food security (Wafa 2022). Nevertheless, there has never been a famine in history despite the Palestinian people being diverse in agriculture, industry, handicrafts and trades (Egypt Gate 2017). According to Tamimi (2012); the World Health Organization (2021), conflict and climate change, racial separation, and issues connected with orientation and age are viewed as one significant effect on food security. However, there are other impacts, for example, critical changes in dietary patterns, economic slowdown and stunting among children under the age of five, wasting, obesity, anaemia among women during childbearing, the degree of breastfeeding, Obesity in grown-ups, as the number of children under the age of five who suffer from stunting reached 155 million, 52 million children (wasting), and 41 million children (overweight).

Table 1: The factors influencing food insecurity in Palestine.

Factors	Effects from the factor	Reason for effect	Policy recommendation	Reference
Conflict	The conflict had no direct impact on the food insecurity of Gazan households.	The conflict has prompted expanded utilization of social safety nets (cash or in-kind exchanges) and access to essential services and support provided to families in the Gaza Strip by national and international organizations after the conflict.	The instance of the conflict in the Gaza Strip exhibits that prompt and critical help to conflict survivors can assist with restoring resilience capacity.	Tilman et al. 2019
Biology and Climatic variables	Climate and bioclimatic variables significantly affect plant biology, crop yield conservation, and	It is affected by climatic variables indicators, including water deficit and soil water reserve.	It is vital to understand that the yearly climatic index is optimal for crop yield.	Ighbareyeh et al. 2016

	prompt expanded food security.			
Insurance behaviour	The implications of a foundation hazard of food insecurity are a significant, officially uninsurable risk.	The proclivity to insure against health impacts increases when one is exposed to extreme food insecurity harm.	Probable incentive shifts favour insurance preferences, with implications for policy formation.	Cavatorta and Pieroni (2013)
Climate change	Climate change is a wellspring of weakness that lessens the degree of food security.	Depict climate change as a provincial security danger, and the spatial investigation of the securitisation.	Use the climate danger situation to build up cycles of military-political control.	Mason (2013)
Climate change	In an intergovernmental organization forum, climatological information is generally perceived as technical.	The different manners by which the occupation explicitly compounds dangers reveals as	The social, monetary, and political settings in moulding populaces' reactions to climate change are significant..	Zeitoun et al., 2012

		constitutive of climate vulnerability in Palestine.		
Water Security	Stakeholders are most concerned with anticipated impacts on water security, which affects food security in Gaza.	Poor water source in Gaza and climate change has exacerbated water scarcity.	The prevalence of temporary enforced adapting' forestalls the advancement of eternal adaptive limit.	Mason et al. 2011
Water Demands	The political situation in Palestine has a significant impact on water accessibility and impacts current and future food security.	The effects of the political contexts threaten water management, water cost, and water trading are all terms.	Water trading, water cost, and water management policies can contribute to future water demands and benefit Palestine's food security.	Haddad et al. 2008
Anaemia among Women and Political Dependence	The pervasiveness of anaemia among women and political reliance (nonviolence) contribute to food security.	Creating a production map and arranging it based on utilization.	Government policies aimed to protect farmers' rights and attract investment in the farming sector.	Hamad (2020)

Environmental Degradation	Food security is affected by environmental degradation.	The Palestinian climate, scarcity of resources, and land degradation threats to the natural ecosystem.	Policies to limit confiscation of land resources and restrictions on moving and exchange are vital.	Badran and Rajabi (2020)
Urban Agriculture	They are contributing to food security through urban agriculture.	The study revealed that urban agriculture creates more career opportunities and improves average earnings.	Need for all relevant institutions to involve urban agriculture in the long-term plans to improve Gaza's high levels of unemployment.	Rahayu et al.(2019)
Demographic and Socioeconomic	The sociodemographic variables affect the prevalence of food insecurity in household members.	The study indicated that administrative divisions, total salary, housing affordability, and job status have strong connections with food insecurity.	Food insecurity is widespread in the Gaza Strip and is linked to poor living standards. As a result, the rising incidence should be seriously debated and urgently addressed.	Bilbeisi et al. (2022)
Water Poverty	Agriculture requires much water, which is	Expanding water deficiencies for rural and diminishing access to the	Palestinian Water Authority to consider cost recuperation and the financial suitability	Bassam et al. 2004

	essential for food security.	water system (decreasing production growth and expanding costs, causing adverse consequences on low-income purchasers).	of irrigation and water supply. Irrigation control strategy changes would be critical considerations for potential agrarian creation,	
Shocks	The unpredictability of the numerous shocks contributes to food insecurity.	Due to conceptual (complexity) and empirical considerations (absence of expected data) to asset food security	Data must be collected over long periods to identify various possible threats and thus enable trend and risk analysis.	Alinovi et al. 2009
Sustainable Farming	As a consequence, unsustainable farming systems have an impact on food security.	They are expanding the farming water gap of the supply-demand.	Palestine, especially West Bank, needs change to gain agricultural sustainability and better food security.	Shadeed et al. 2020
Assistance and support	Without assistance, both food security and poverty level would be higher for WBGS.	The frequency of aid support directly affects poverty and decreases in spots with lower support rates.	The global community cannot abandon its assistance to Palestinian households without	Romano et al. 2019

			seriously jeopardizing their wellbeing.	
Israeli assault and displacement	Every Israeli assault and displacement has a significant impact on food security.	Extreme harm in different areas throughout the Gaza Strip, forcing urban farmers to evacuate their places and nation or domains, killing and harming citizens, and destroying urban agriculture that helps secure daily needs during Israel's aggression against the Gaza Strip.	Government assistance is desperately needed, as are urban agriculture holdings, involving urban farming and coordinating individuals to help each other.	Khalil (2008)
Conflict	Conflict affects food security and reduces a family's dietary diverse range.	Conflicts impact education, governorates, and wealth and restrict access to land.	Significantly efforts on political, agricultural, to easy economic pressures on food diversity and insecurity in Palestine.	Lin et al. 2021

Renewable energy resources	Energy directly impacts poverty in Palestine and, thus on, food security.	There are numerous deficient grid systems, an absence of electricity access, insufficient warming or cooling, lodging, and rising prices.	In Palestine, political instability restricts the total usage and improvement of renewable energy and the potential to eliminate energy poverty.	Hamed and Peric (2020)
Climate Change	Climate change amplifies food security threats.	Catastrophic events scatter and more challenging access to land and water, and a decrease in productivity	The Palestinian circumstance is particular in that water assets are affected by environmental variables and political limitations.	Natsheh (2012)
Gender Inequality	Inequality between men and women in Palestine, or in Arab countries, has a negative impact on food security.	Levels of inequality can reduce females' farm productivity, salary, and, essentially, their rights to obtain nutritious and multifaceted diets, even though her labour is	Arab countries proceed to get the most significant gender inequalities globally. Gender issues in income and educational levels regionally.	Harake et al. 2022

		frequently unpaid or poorly paid.		
Hunger	Hunger is a vital sign of food insecurity, as estimated by the universality of undernutrition.	Impacts on sustenance farming, monetarily, and food frameworks that focus on admittance to protected, nutritious, adequate, and great nourishment for all.	The United Nations agencies are already calling for new approaches to combining food security issues into malnourishment elimination, highlighting food insecurity, hunger, and nutritional implications.	Mustafa et al. 2021
Advanced technical and managerial tools to improve the water supply	Both technological and organisational mechanisms can strengthen water supply and contribute to food security.	Most of the elements influence institutional requirements and water sources.	Advancements in data transfer styles, including data collection, exchanging data on catchment areas, water recycling, and reuse methods.	Arlosoroff 2007
Land and Water resources restrictions	Land and water are the foundations of agrarian	In terms of water resources, Israel utilizes over 80% of Palestinian groundwater	The Palestinians continue to face strict restrictions in using Palestinian land and	Isaac (2012)

	food and nutrition security.	while rejecting Palestinian's access to the Jordan River.	water. More than 70% of the West Bank and nearly 22% of Gaza are unreachable to Palestinians.	
Agricultural output, Distribution networks, and GDP.	Food security is linked to agricultural production, distribution networks, and GDP.	Domestic production is also a significant issue due to climatic considerations, which can be extremely harsh.	The latest scientific process has aided in specific ways, and a reliable global political order will indeed assist in trading facets for ethics of development.	Sarma (2022)
Economic growth.	Economic growth is required to achieve food security.	The diversity that provides jobs for most citizens aids in the growth of the Palestinian industry and aids in worldwide trade.	It has successfully developed policies and investments to move forward in this direction since because of examples from an earlier time.	Breisinger et al. 2010
Instability of food prices	The high instability of food costs contrarily affects food security.	Food price increases overshadow consumption as the accessibility	The global food price crisis prompted governments to reorganize policy initiatives	Breisinger et al. 2010

		of almost every other agricultural good and basic staples and livestock outputs declines.	and investment vehicles to develop food security and better connect food security to public advancement techniques and plans.	
Migration motives.	Food insecurity appears to be an essential factor in both migration motives.	The intensity of food insecurity differs significantly by orientation (gender) and income status.	Proof shows that higher collaboration between global food security and migration national policies is required.	Smith and Floro (2020)
UNRWA Financing	Food security is jeopardised because of the absence of UNRWA financing for Palestinians.	UNRWA is still suffering from an extreme funding crisis.	An international effort is required to enable UNRWA to provide long-term assistance to Palestine refugees.	Kitamura et al. 2018
Malnutrition and Hunger.	Food insecurity is exacerbated by malnutrition and hunger.	Prolonged crises, social unrest, and exposure to multiple shocks and	Protein-calorie terms, nutrient and mineral lack problems and side effects, and circumstances are	Iwasa et al. 2016

		stresses such as conflict and poverty	estimated and the difficulties of getting to nourishment review information.	
COVID-19 pandemic.	The pandemic of COVID-19 affects dietary patterns and food security, especially among school students.	There was a significant increase in the number of people consuming mother's house meals and preventing purchasing takeout because they were concerned about hygiene standards outside.	To avoid the negative consequences of pandemics and wellbeing sicknesses, the Ministry of Education should focus on improving school understudies' mindfulness toward expanded admission of quality food and embracing good dietary patterns amid the expansion of pandemics and wellbeing sicknesses.	Radwan et al. 2021

4.5 Prominent Factors Contributing to Food Insecurity in Palestine

To further understand the factors influencing food security in Palestine in **Table 1**, an depth of the determinants is discussed below.

4.5.1 Conflicts

Conflicts are the most common causes of food insecurity because they disrupt all aspects of life, including agricultural production, human displacement, high prices in local markets, a lack of food, and a lack of import capacity, among other objects. The food-insecure people living in conflict-affected areas are nearly half of the total number of food-insecure people worldwide, as 489 million people out of 815 million people worldwide (2018-2020). The most specific types of conflicts are civil and internal conflicts, which are defined as conflicts between two armed groups in which the state or government is not linked or involved (FAO 2021).

AbuAsal (2022) mentioned that over 68% of Gaza's families, or roughly 1.3 million individuals, face extreme or moderate food insecurity. The ongoing conflict between Gaza and Israel, and the forced limitations and terminations, have resulted in a decline in food security and an increase in the number of food-insecure individuals. Since Palestinians are a consumption society, most of the food is bought from Israel and abroad, including vital food. During clashes, Israel forbids its items and markets from being utilized by the Palestinian side and closes borders with other nations, keeping the Palestinian market from importing from neighbouring countries (Rajoub 2021; Karzam 2008).



Figure 9. Partition of the map of Palestine (1946 - 2011):: Hanlie (2008)

According to Marefa (2007), power struggles, such as the conflict between Fatah and Hamas in Palestine, have continued for centuries since power was assumed. The leadership of Hamas is based on its military movement, which leads the resistance against the occupation, and it is part of the Islamic Renaissance Movement. It believes that this renaissance is the main gateway to its ultimate goal of liberating Palestine from the river to the sea. The Fatah movement, on the other hand, is a revolutionary movement based on the principle that Palestine is a land for all Palestinians, and avoiding class, factional, sectarian, and regional conflict alongside the liberation of Palestine, ending settlement, and realizing the inalienable rights of Palestinians (PLO 2022). The political conflict between the two movements emitted after Hamas held onto control of the Gaza Strip, provoking a hostile reaction from the Palestinian Authority in the West Bank. The contention over human rights in the occupied Palestinian territories heightened in 2007, bringing about insecurity, duplication of power, and an absence of synchronization of some military parts of the old authority did not coincide. The adoption of new government decisions, which prompted the assertion of a state of emergency on both sides in the event of the support of an authority loyal to another, resulted in the collapse of the internal Palestinian harmony process, an increment in Israel's ability to reinforce settlement and confine and blockade the Palestinian economy, and a reduction in the effectiveness of the peace process (Salima 2018; Wahib 2006).

4.5.2 Poverty

Poverty is closely connected with food insecurity and the stability of food access, exposing low-income families to the dangers of rising food costs in global markets due to a reduction in purchasing power.

Unemployment is one of the main factors that contribute to poverty in Palestine, and it tends to be brought about by abstract factors like sickness, a low degree of instruction, or deficiency in the work market, for example, not permitting ladies to work in different fields and forcing limitations on ladies' movement and development. Divorced women and youthful widows, specifically, do have not many open positions. Long-term unemployment caused by sickness and inability to work requires total dependence on help and aid. Unemployment ascends typically because of the political circumstance, as countless individuals depend on blue-collar work (wage-earning work) in Israel; notwithstanding, since the foundation of the Palestinian Authority, this number has diminished because of the permit system and constant closures (MPPN 2020; Al-Qazzaz 1998).

Then, at that point, trailed by divorce or widowhood and the excessive costs (exorbitant costs of necessary goods and services), these reasons face ladies specifically from their social and monetary circumstances and increment the possibilities of child labor. The number of widowed, divorced and abandoned cases has reached around 34% of West Bank families getting help from the Ministry of Social Affairs, while the rate has arrived at 55.5% in the Gaza Strip. Some Palestinian women accept that the spouse is the essential wellspring of family income and that his nonattendance implies an absence of a kind of revenue (Khaled 2009; Gildas 2019).

According to Tina et al. (2019) One of the primary drivers of poverty is weak family bonding, which is connected to a poverty-fighting strategy that depends intensely on family members and relatives, notwithstanding advanced age, the presence of occupation and refuge, and an absence of types of revenue like legacy and land. One of the reasons for poverty is the introduction of females and the shortfall of males in the family (the deficiency of numerous males because of contentions with Israel) since males begin working at a younger age and at a more prominent rate than females, and the male offers the family's pay in a more considerable extent than females. The old (those beyond 56 years old) represent 6% of the West Bank populace and 5% of the Gaza Strip populace.

In 1995, the old established 30% of the cases of social affairs in the West Bank and 15% in the Gaza Strip, where the more senior became dependent and a burden to unfortunate families because of the absence of foundations that give care to the old.

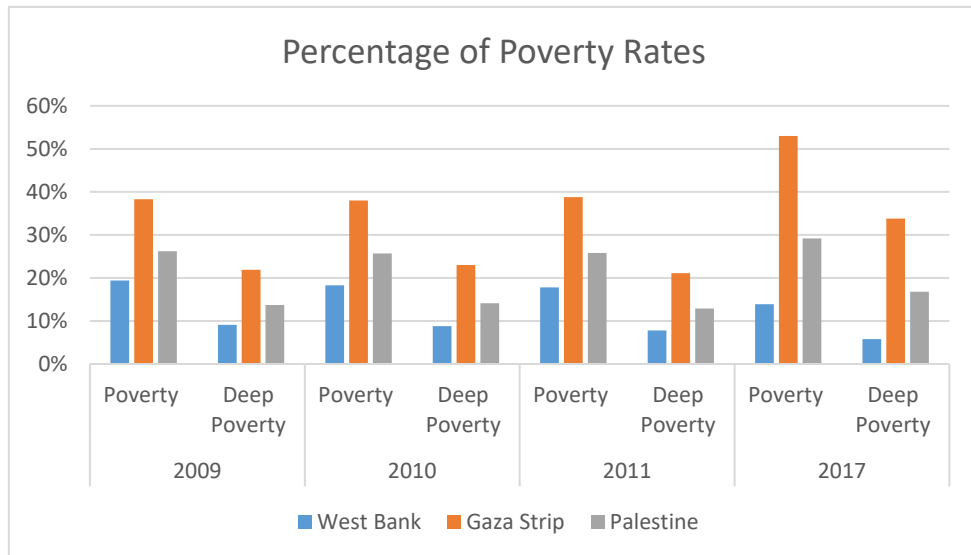


Figure 10. Percentage of Poverty Rates in Palestine: source: Palestinian Central Bureau of Statistics (2017)

4.5.3 Climate Change

Climate change consequences such as the rise of dry seasons, storms, and severe hotness waves. have risen as one of the leading causes of food insecurity in many nations worldwide. Climate change affects agricultural production; increasing temperature and changing seasonal patterns will decrease agricultural productivity for certain harvests and domesticated animals. The Palestinian economy overall is portrayed as an agrarian economy in any case. Extreme openness to climatic shocks as often as possible causes critical misfortunes and harms, mainly since Palestine is an expression that lacks advanced agricultural systems, which is a significant component in alleviating the impacts of environmental change NASA (2022); Wishahi (2013).

Climatic changes, such as higher-than-average temperatures and lower-than-average rainfall rates, have resulted in a significant decline in the West Bank's olive yield (see Table 2). As of 2018, the West Bank's olive harvest amounted to about ten thousand tons, accounting for half of the annual output, ranging from more than 20 thousand tons (Al-Makhlali et al. 2020).

Table 2: Production, yield, and area harvested of Palestinian agriculture 2018

Product	Production	Yield	Area harvested ha
Olives	89,460	15,962	56,047
Wheat	34,173	22,203	15,391
Grapes	38,134	108,397	3,518
Tomatoes	123,392	1,253,984	984
Dates	6,800	105,426	645
Vegetables, fresh nes	11,867	227,337	522
Lemons and limes	14,458	330,091	438

(FAO 2022)

Numerous natural hazards are turning out to be more frequent and severity in Palestine, the most genuine of which is a dry spell and an absence of water sources, as a lack of downpour prompts an expansion in the water deficiency, which lessens the possibilities of profiting from precipitation when it happens to take care of the underground repository. Moreover, rising temperatures increase the need to irrigate plants and the water demand, which means the already scarce resource will be put under even more strain (Wishahi 2013).

Drought and overgrazing are serious problems that intimidate the state's capabilities, as Palestine is experiencing an expansion of the phenomenon of desertification, an effect on soil salinity, turbulence at the beginning of the rainfalls, and an irregularity in the amount of precipitation, at periods the rain recedes and on the other hand sometimes massive amounts of it precipitate (Al-Dhuib 2011).

In Palestine, the pace of sunlight-based radiation reaches 3400 hours annually, and this rate varies from one district to another; the speed of sun oriented radiation expansions in the south and diminishes in the north. As far as temperature, the average yearly temperature in Palestine fluctuates from one month to another and from one locale to another, contingent upon astronomical and geological location and topography.

Early (autumn) rains, seasonal (winter) rains, and late (spring) rains are the three periods of the rainy season. According to Figure 11, Palestine's annual rainfall range from 250 to 800 mm, with a decrease to the south due to the presence of the Negev desert and an increase to the East due to the presence of mountain barriers(Wafa 2022; Golodets 2013).

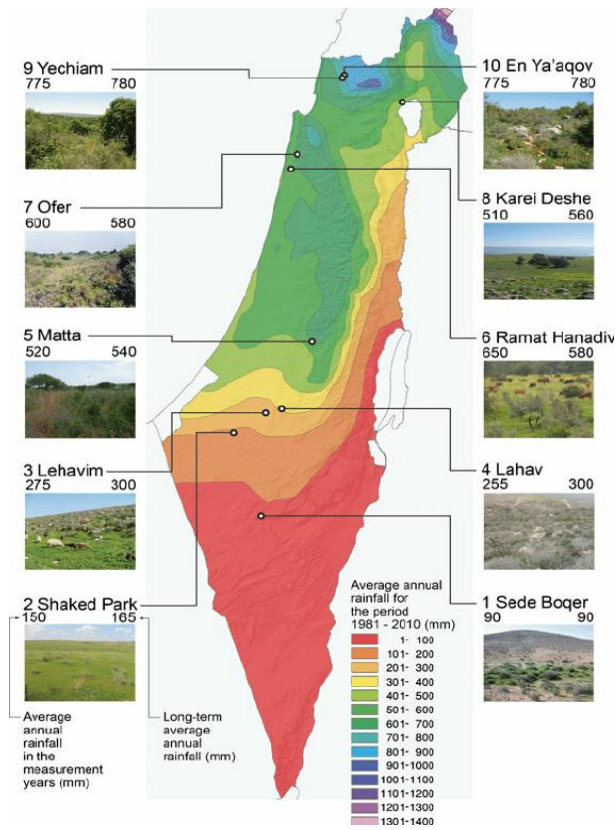


Figure 11. Average annual rainfall (1981-2010): source: Golodets (2013)

4.5.4 Water Security

The world Bank (2021) characterized water security as "the availability of adequate water for nutrition, livelihood opportunities, natural systems, and manufacturing, combined with an appropriate standard of water-related threats to individuals, conditions, and financial systems in terms of quantity and quality. Water is both a natural resource and financial item, and a human utilization entitlement. Water insecurity issues can be assembled under three fundamental headings: access, availability, and utilization."The demand for water in quantity and quality for various uses on a worldwide scale is growing more and more; this is due to an increase in the global population, the expansion of industry, an improvement in the living standards, a keep increase in irrigation water farmlands, and many other variables (Grey 2007).

Water is still the most elusive resource in the Palestinian Territories, and its limited availability is the main impediment to economic growth. Moreover, in Palestine, the management and allotment of water resources are regarded as critical issues in the bilateral and regional peace processes (Haddad 2004). The Palestinian territories have water scarcity in the Middle East and are one of the most poorly developed water sectors. Water sources are shared by Palestinians and Israelis, especially underground sources. However long, the issue of water is one of the particular issues between the Palestinian side and the Israeli occupation state. The majority of the water sources in Palestine are as yet heavily controlled by the Israeli occupation, particularly the underground ones, without considering the Palestinian's portion in these sources, or considering the developing water needs of the Palestinian people, since Israel utilizes approximately 80% of groundwater sources and keeps rejecting Palestinians access to Jordan River. In Palestine, classified as an arid to the semi-arid area, an absence of adequate water for various utilizes hampered long-term development. Due to rapid population growth and the agricultural expansion exercises, the case has deteriorated, putting a significant strain on the restricted available water such as groundwater. Furthermore, the political conflict affects the provision and ease of access to water supplies (Riksen 2020).

Water tanks in black and white are common on the housetops of Palestinian houses in West Bank urban areas and towns, just to be filled when the taps dry up for quite a long time.

Israeli authorities do not concede Palestinian water authorities with the fundamental licenses to work openly in "C" zones, subject to complete Israeli authoritative and security control, penetrating extra wells or introducing promoter siphons. Israel controls 85% of the West Bank's water assets and has an assumption over how the remaining are distributed (Najib 2021).

The issue is likely to worsen due to population growth, among several others. Whereas the West Bank currently has an inhabitant of about 2.5 million people, it is estimated to rise significantly shortly. By 2050, the inhabitants of Israel are projected to reach 13 million Palestinian citizens and 12 million Israeli citizens. The Palestinian inhabitants increase by approximately 2.18 percent per year (Bridges 2016).

According to The Palestinian Bureau of Statistics (PCBS 2022), the average Palestinian receives lower than 25 cm of water per year for household and commercial use. The per capita share of fresh water in Gaza reached 83.1 litres per day, a decrease of 5.2 litres from the previous year due to population growth, and by taking the high contamination pace of water in Gaza and computing the amounts of water suitable for human use from the available amounts, partitioned by the populace, the per capita share of freshwater reaches only 22.4 litres per day. Given the divergence in per capita shares among governorates, one of Palestine's primary challenges in accomplishing justice is the distribution of population centres. It is worth noting that the average Palestinian per capita water consumption remains lower than the global minimum (PCBS 2019).

In the Gaza Strip, where water is scarce, the demand for water and the multiplying of the water deficiency will rush the course of seawater entering the aquifer and foreshadow a deterioration in water quality. Likewise, the large number of weighty downpour episodes increases the probability of flooding, especially in thickly populated urban areas that lack water waste frameworks. Heat attacks are hazardous to the health and safety of patients, the elderly, and children, mainly when it occurs in conjunction with a low electrical flow and long periods of interruption (Casas 2020; Wafa 2022).

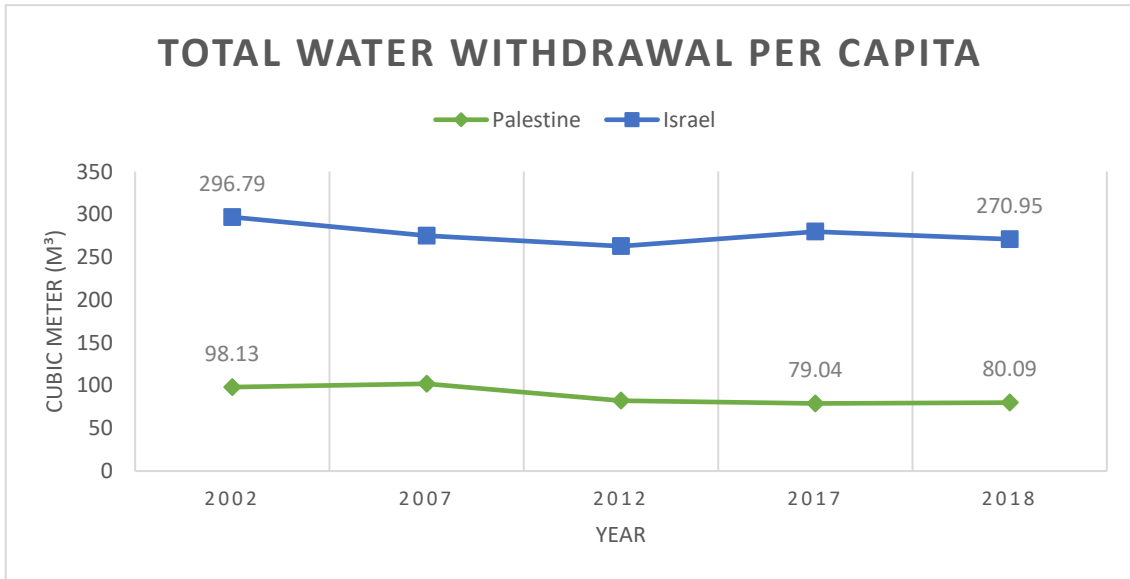


Figure 12.Total water withdrawal per capita in Palestine and Israel: source: AQUASTAT (2022)

Figure 12 shows that total water withdrawal per capita in Palestine is generally declining, reaching 80.09 cubic meters in 2018, the earlier year it was remaining 79.04 cubic meters, addressing a 1.33 percent increment, contrasted with the utilization of 6 million Israelis for the leftover sources, which is identical to 270 cubic meters for every Israeli individual per year (2018), approximately four times what the Palestinian individual consumes(Knoema 2022).

5. Conclusions

The food security issue is counted as part of the international food challenge where most developing countries are floundering, as it is basically characterized by the failure of Palestinian domestic producers to keep pace with the necessities of the inhabitants, as well as a lower incidence of independence in essential farming food items, mainly olives and legumes. The objective of the study was to examine the status of food security and the factors influencing food security in Palestine. The study revealed that some of the main factors influence food security in Palestine were conflict, climate change, poverty, and water security.

The first objective that better understand and monitor the diversity are needed in conflict areas, condition, and interrelationships of food security and conflict. To improve the food security in Palestine the government should collect more dependable and useful data whether on and associated with social, governmental, financial, and governmental factors are required at the national scale.

The second objective is that Palestine's continued demand for food from the international market, to accomplish the demands of the populace. to boost food security Instead of relying heavily on exports, the government should promote and increase domestic production and the availability of food security components from natural and HR, and contribute to shuttering the food hole and depend on domestic production to meet the populace's food needs.

Third, Climate fluctuations, and the subsequent lack of rain, contributed to a decline in cultivated areas and low levels of production, in addition to a reduced average water share per capita. Governments should concentrate to food security early warning systems in order to reduce the effects of drought and other climatic phenomena on food security, particularly for the affected population.

The fourth objective is the limitation of the Israeli occupation on all Palestinian sectors and command over enormous regions of the West Bank. the Palestinian Authority must establish an agricultural bank that provides loans for agricultural reclamation and agricultural projects with no profit, as well as compensate farmers for lands confiscated by the occupation.

The last objective describes the relationship between both food security and the agricultural sector as a positive relationship (effect and impact). to increment food security The government should initially instruct and educate farmers on the proper and strategic method to follow sound agricultural foundations.

6. References

- Abdelnour S, Agha Z, Baconi B, Dajani M, Victor Kattan, Sansour V, Tartir A, Zurayk R. 2021. Focus On: Palestine's Natural Resources - Al-Shabaka. Available from <https://al-shabaka.org/focuses/focus-on-palestines-natural-resources/> (accessed 2021).
- Abdelrahman M. 2021. Olive, Blessed Tree. Arabi21.
- AbuAsal Y. 2022. The European Union and the World Food Program Contribute to the Recovery of Palestinian Families Affected by the Escalation in Gaza | World Food Program. Available from <https://ar.wfp.org/news/eu-and-wfp-contribute-recovery-palestinian-families-affected-escalations-gaza>. (accessed 2022)
- AbuLayla. (2016). Alhadath. Retrieved from <https://www.alhadath.ps/article>
- AbuLayla. (2016). Alhadath. Retrieved from <https://www.alhadath.ps/article>
- Al-Awsat. 2021. MENA Has a Food Security Problem, But There Are Ways to Address It. Available from <https://www.worldbank.org/en/news/opinion/2021/09/24/mena-has-a-food-security-problem-but-there-are-ways-to-address-it>. (accessed September 2021)
- Albaba I, Alimari A, Salem H, Dajani M. 2018. Assessment of Climate Change Variability Impacts. *Journal of Agricultural Science and Technology A* 8: 59–67. Available from <https://doi.org/10.17265/2161-6256/2018.02.002>. (accessed 2018)
- Alinovi L. Mane E. Romano D. 2009. EC-FAO Food Security Programme Linking Information and Decision Making to Improve Food Security measuring household resilience to food insecurity: application to Palestinian households. Available from www.foodsec.org (accessed 2009).
- Alinovi L. Mane E. Romano D. 2009. EC-FAO Food Security Programme Linking Information and Decision Making to Improve Food Security measuring household resilience to food insecurity: application to Palestinian households. Available from www.foodsec.org (accessed 2009).
- Al-Najar H. Khalil H. Rahayu YS. 2019. High unemployment records of graduated students in the development of urban agriculture in the Gaza strip. *Indonesian Journal of Science and Technology*, 4(2), 196–203. Available from <https://doi.org/10.17509/ijost.v4i2.18176> (accessed 2019).
- Al-Najar H. Khalil H. Rahayu YS. 2019. High unemployment records of graduated students in the development of urban agriculture in the Gaza strip. *Indonesian Journal of Science and Technology*, 4(2), 196–203. Available from <https://doi.org/10.17509/ijost.v4i2.18176> (accessed 2019).
- Al-Qazzaz H. 1998. Poverty in Palestine.
- AQUASTAT. 2022. AQUASTAT Database Database Query Results. Available from <https://www.fao.org/aquastat/statistics/query/results.html>. (accessed 2022)

- Arab org. 2021. Information of Civil Society Organizations Operating in Palestine. Arab Org. Available from <https://arab.org/countries/palestine/> (accessed 2021)
- Arabic news. 2021. Palestinian Economy. Arabic News. Available from <https://www.bbc.com/arabic> (accessed March 2021).
- Arlosoroff S. 2007. Water Demand Management – A Strategy to Deal with Water Scarcity : Israel as a Case Study Director and Chairman of the Finance and Economic Committee , The National Water Corporation of Israel. *Water Resources in the Middle East*, 325–330.
- Arlosoroff S. 2007. Water Demand Management – A Strategy to Deal with Water Scarcity : Israel as a Case Study Director and Chairman of the Finance and Economic Committee , The National Water Corporation of Israel. *Water Resources in the Middle East*, 325–330.
- Badran AM. Rajabi R. (2020). Food Security And Food Sovereignty Occupied In Palestine Territories.
- Badran AM. Rajabi R. (2020). Food Security And Food Sovereignty Occupied In Palestine Territories.
- Bassam R. Bushnaq O. Haddad M. 2004. Implications of Water Management Policies on Water Poverty in Palestine.
- Bassam R. Bushnaq O. Haddad M. 2004. Implications of Water Management Policies on Water Poverty in Palestine.
- BBC News. 2021. Euphrates River: An Unprecedented Decrease in Its Flow Level. BBC News, Available from <https://www.bbc.com/arabic/middleeast-57001890> (accessed May 2021).
- Berry EM, Dernini S, Burlingame B, Meybeck A, Conforti P. 2015. Review Article Food Security and Sustainability: Can One Exist without the Other? Available from <https://doi.org/10.1017/S136898001500021X> (accessed 2015).
- Bilbeisi AH. alJawaldeh A. Albelbeisi A. Abuzerr S. 2022. Households' Food Insecurity and Its Association with Demographic and Socioeconomic Factors in Gaza Strip, Palestine: A Cross Sectional Study Healthy diet View project Infant and Young Child Feeding View project. Article in *Ethiopian Journal of Health Sciences*. Available from <https://doi.org/10.4314/ejhs.v32i2.18> (accessed 2022).
- Bilbeisi AH. alJawaldeh A. Albelbeisi A. Abuzerr S. 2022. Households' Food Insecurity and Its Association with Demographic and Socioeconomic Factors in Gaza Strip, Palestine: A Cross Sectional Study Healthy diet View project Infant and Young Child Feeding View project. Article in *Ethiopian Journal of Health Sciences*. Available from <https://doi.org/10.4314/ejhs.v32i2.18> (accessed 2022).
- Booyesen H. 2008. *The Occupation Is the Problem: Palestinian History, Politics and the Prospect for Peace*. Researchgate.

- Breisinger C. Ringler C. Pratt N. Minot NW. 2010. Food Security and Economic Development in the Middle East and North Africa: Current State and Future Perspectives. Available from <http://www.ifpri.org/publications/results/taxonomy%3A468> (accessed 2010).
- Breisinger C. Ringler C. Pratt N. Minot NW. 2010. Food Security and Economic Development in the Middle East and North Africa: Current State and Future Perspectives. Available from <http://www.ifpri.org/publications/results/taxonomy%3A468> (accessed 2010).
- Brück T. d'Errico M. Pietrelli R. 2019. The effects of violent conflict on household resilience and food security: Evidence from the 2014 Gaza conflict. *World Development*, 119, 203–223. Available from <https://doi.org/10.1016/j.worlddev.2018.05.008> (accessed 2019).
- Brück T. d'Errico M. Pietrelli R. 2019. The effects of violent conflict on household resilience and food security: Evidence from the 2014 Gaza conflict. *World Development*, 119, 203–223. Available from <https://doi.org/10.1016/j.worlddev.2018.05.008> (accessed 2019).
- Casas M. 2020. Climate Change, Agriculture and Gender in Gaza: Assessing the Implications of the Climate Crisis for Smallholder Farming and Gender within Olive and Grape Value Chains in Gaza. Available from www.oxfam.org (accessed July 2020).
- Cavatorta E. Pieroni L. (2013). Background risk of food insecurity and insurance behaviour: Evidence from the West Bank. *Food Policy*, 43, 278–290. Available from <https://doi.org/10.1016/j.foodpol.2013.09.019> (accessed 2013).
- Cavatorta E. Pieroni L. (2013). Background risk of food insecurity and insurance behaviour: Evidence from the West Bank. *Food Policy*, 43, 278–290. Available from <https://doi.org/10.1016/j.foodpol.2013.09.019> (accessed 2013).
- Dr.Khaled. 2009. Palestinian Study, Economic, Educational, Marital, Familial, and Social Characteristics of the Land in the Family. Available from <http://www.pcbs.gov.ps> (accessed 2009).
- Economic. 2019. Only 3.22 % of the Cultivated Area in Saudi Arabia out of the Total Valid Lands. *Economic*. Available from https://www.aleqt.com/2019/04/22/article_1585541.html. (accessed April 2019).
- Egypt Gate. 2017. National Heritage. Available from <https://sis.gov.eg/?lang=ar> (accessed July 2017).
- El-Harake MD. Kharroubi S. Zabaneh J. Jomaa L. 2022. Gender-based differentials in food insecurity and wellbeing in Arab countries. *Global Food Security*. 32, 100609. Available from <https://doi.org/10.1016/J.GFS.2021.100609> (accessed 2022).
- El-Harake MD. Kharroubi S. Zabaneh J. Jomaa L. 2022. Gender-based differentials in food insecurity and wellbeing in Arab countries. *Global Food Security*. 32, 100609. Available from <https://doi.org/10.1016/J.GFS.2021.100609> (accessed 2022).
- F, B. (2021, September). WFP Palestine. Retrieved from world food programme: www.wfp.org/countries/palestine

- F, B. (2021, September). WFP Palestine. Retrieved from world food programme:
www.wfp.org/countries/palestine
- FAO . 2021. Available from <http://www.fao.org/faostat/en/?#data/FS> (accessed 2021)
- FAO. 2005. food and agriculture organization of the united nations nutrition country profile Palestine | Food and Agriculture Organization of the United Nations. Available from <https://www.fao.org/home/en> (accessed 2005).
- FAO. 2017. The State of Food Security and Nutrition in the World 2017 | Food and Agriculture Organization of the United Nations. Available from <https://www.fao.org/state-of-food-security-nutrition/2017/ar/> (accessed 2017).
- FAO. 2021a. Food Utilization | Food and Agriculture Organization of the United Nations. Available from <https://www.fao.org/home/en> (accessed 2021).
- FAO. 2021b. Suite of Food Security Indicators | Food and Agriculture Organization of the United Nations. Available from <https://www.fao.org/faostat/en/#data/FS> (accessed 2021).
- FAO. 2022. FAOSTAT | Food and Agriculture Organization of the United Nations. Available from <https://www.fao.org/faostat/en/#data/QCL> (accessed 2022).
- FAOSTAT. 2021. Food Security in Palestine | Food and Agriculture Organization of the United Nations. Available from <https://www.fao.org/faostat/en/#home> (accessed 2021).
- FAOSTAT.2022. Food and Agriculture Organization of the United Nations. Available from <https://www.fao.org/faostat/en/#home> (accessed February 2022).
- FOOD SECURITY BULLETIN. (2015, Winter 13). Retrieved from Palestine Economic Policy Research Institute (MAS): <https://www.mas.ps/files/server/20160102115156-1.pdf>
- FOOD SECURITY BULLETIN. (2015, Winter 13). Retrieved from Palestine Economic Policy Research Institute (MAS): <https://www.mas.ps/files/server/20160102115156-1.pdf>
- Gaza city. 2009. The New Humanitarian | Malnutrition Worsens among Children. Available from <https://www.thenewhumanitarian.org> (accessed 2009).
- Gildas H. 2019. Poverty and Charity in Roman Palestine. World Development. Available from https://cpb-us-e1.wpmucdn.com/sites.ucsc.edu/dist/9/20/files/2015/06/poverty_charity.pdf (accessed 2019).
- GISHA. 2021. Gaza’s Workforce Continues to Shrink, 43% Unemployment in the Last Quarter of 2020 - Gisha. Available from <https://gisha.org/en/gazas-workforce-continues-to-shrink-43-unemployment-in-the-last-quarter-of-2020/> (accessed April 13, 2021).
- Global Food Security Index. 2019. Food Security of Countries | Global Food Security Index. Available from <https://impact.economist.com/sustainability/project/food-security-index/> (accessed 2019).
- Golodets C. 2013. From Desert to Mediterranean Rangelands: Will Increasing Drought and Inter-Annual Rainfall Variability Affect Herbaceous Annual Primary Productivity?. Climatic Change 119: 785–98. Available from <https://doi.org/10.1007/S10584-013-0758-8> (accessed 2013).

- Gustafson S. 2020. Global Report on Food Crises: 135 Million in 55 Countries Faced Acute Hunger in 2019. International Food Policy Research Institute. Available from <https://www.ifpri.org/blog/global-report-food-crises> (accessed April 2020).
- Haddad M. Jayousi A. Hantash SA. 2008. International Water Technology Conference (Vol. 12).
- Haddad M. Jayousi A. Hantash SA. 2008. International Water Technology Conference (Vol. 12).
- Hamad. 2020. Factors Effecting Achieving Food Security in Palestine.
- Hamad. 2020. Factors Effecting Achieving Food Security in Palestine.
- Hamed TA. Peric K. 2020. The role of renewable energy resources in alleviating energy poverty in Palestine. *Renewable Energy Focus*, 35, 97–107. Available from <https://doi.org/10.1016/J.REF.2020.09.006> (accessed 2020).
- Hamed TA. Peric K. 2020. The role of renewable energy resources in alleviating energy poverty in Palestine. *Renewable Energy Focus*, 35, 97–107. Available from <https://doi.org/10.1016/J.REF.2020.09.006> (accessed 2020).
- Harakati F. 2018. Analyzing the Problem of Food Security in the Arab World and Evaluating Solutions to Confront It, Web of science.
- Ighbareyeh JMH. Cano-Ortiz A. Carmona EC. Ighbareyeh MH. Suliemih A. 2016. Effect of Biology, Climatic and Bioclimatic Applied Studies on Plant: to Increase the Economy and Maintaining Food Security in the Jerusalem Occupied of Palestine. *International Journal of Research Studies in Biosciences (IJRSB)*, 4(2), 54–60. Available from www.arcjournals.org (accessed 2016).
- Ighbareyeh JMH. Cano-Ortiz A. Carmona EC. Ighbareyeh MH. Suliemih A. 2016. Effect of Biology, Climatic and Bioclimatic Applied Studies on Plant: to Increase the Economy and Maintaining Food Security in the Jerusalem Occupied of Palestine. *International Journal of Research Studies in Biosciences (IJRSB)*, 4(2), 54–60. Available from www.arcjournals.org (accessed 2016).
- Isaac. 2012. Resource Scarcity and Food Security in Palestine. Available from https://www.researchgate.net/publication/264876992_Resource_Scarcity_and_Food_Security_in_Palestine (accessed 2012).
- Isaac. 2012. Resource Scarcity and Food Security in Palestine. Available from https://www.researchgate.net/publication/264876992_Resource_Scarcity_and_Food_Security_in_Palestine (accessed 2012).
- Iwasa T. Matsuzaki T. Yano K. Munkhzaya M. Tungalagsuvd A. Yiliyasi M. Kuwahara A. Irahara M. 2016. Developmental changes in the hypothalamic mRNA expression levels of brain-derived neurotrophic factor and serum leptin levels: Their responses to fasting in male and female rats. *International Journal of Developmental Neuroscience*, 54, 1–5. Available from <https://doi.org/10.1016/j.ijdevneu.2016.08.001> (accessed 2016).
- Iwasa T. Matsuzaki T. Yano K. Munkhzaya M. Tungalagsuvd A. Yiliyasi M. Kuwahara A. Irahara M. 2016. Developmental changes in the hypothalamic mRNA expression levels of brain-derived neurotrophic factor and serum leptin levels: Their responses to fasting in

- male and female rats. *International Journal of Developmental Neuroscience*, 54, 1–5. Available from <https://doi.org/10.1016/j.ijdevneu.2016.08.001> (accessed 2016).
- Jeremy M. 2019. Yemen: Civil War and Regional Intervention. Available from www.crs.gov (accessed 2019).
- Kanafani N, Al-Botmeh S. 2008. The Political Economy of Food Aid to Palestine 3 (2). Available from www.epsjournal.org.uk (accessed 2008).
- Kanafani, N. (2012). The Palestinian economy: Macroeconomic and trade. Retrieved from United Nations Conference on Trade and Development: https://unctad.org/system/files/official-document/gdsapp2011d1_en.pdf
- Kanafani, N. (2012). The Palestinian economy: Macroeconomic and trade. Retrieved from United Nations Conference on Trade and Development: https://unctad.org/system/files/official-document/gdsapp2011d1_en.pdf
- Karzam G. 2008. Freedom from the Control of the Israeli Occupation in the Process of Feeding and Starving Us. 2008. Available from https://www.maan-ctr.org/magazine/Archive/Issue7/main_topic/topic1.htm (accessed 2008).
- Katkhuda N. 2020. Food Security in the Middle East. Echoing Sustainability in MENA,. Available from <https://www.ecomena.org/food-middle-east/> (accessed August 2020).
- Khader, A. (2009, September). Anaemia among pregnant Palestinian women in the Occupied Palestinian Territory. Retrieved from researchgate: https://www.researchgate.net/publication/26740293_Anaemia_among_pregnant_Palestinian_women_in_the_Occupied_Palestinian_Territory
- Khader, A. (2009, September). Anaemia among pregnant Palestinian women in the Occupied Palestinian Territory. Retrieved from researchgate: https://www.researchgate.net/publication/26740293_Anaemia_among_pregnant_Palestinian_women_in_the_Occupied_Palestinian_Territory
- Khalidi R. 2011. *Journal of Palestine Studies*. Available from <https://ciaotest.cc.columbia.edu/journals/jps/v40i2/> (accessed 2011).
- khalidi. 2017. Strategic Food Security Review and Nutrition in Palestine.
- Khalil. (2008). THE ROLE OF THE URBAN AGRICULTURE ON FOOD SECURITY DURING ARMED CONFLICTS IN THE GAZA STRIP.
- Khalil. (2008). THE ROLE OF THE URBAN AGRICULTURE ON FOOD SECURITY DURING ARMED CONFLICTS IN THE GAZA STRIP.
- Kitamura A. Jimba M. McCahey J. Paolucci G. Shah S. Hababeh M. Shahin Y. Seita A. 2018. Health and dignity of Palestine refugees at stake: a need for international response to sustain crucial life services at UNRWA. *The Lancet*, 392(10165), 2736–2744. Available from [https://doi.org/10.1016/S0140-6736\(18\)32621-7](https://doi.org/10.1016/S0140-6736(18)32621-7) (accessed 2018).
- Kitamura A. Jimba M. McCahey J. Paolucci G. Shah S. Hababeh M. Shahin Y. Seita A. 2018. Health and dignity of Palestine refugees at stake: a need for international response to

- sustain crucial life services at UNRWA. *The Lancet*, 392(10165), 2736–2744. Available from [https://doi.org/10.1016/S0140-6736\(18\)32621-7](https://doi.org/10.1016/S0140-6736(18)32621-7) (accessed 2018).
- Knoema. 2022. Palestine Total Water Withdrawal per Capita, 1958-2021 - Knoema.Com. Available from <https://knoema.com/atlas/Palestine/topics/Water/Water-Withdrawal/Total-water-withdrawal-per-capita> (accessed 2022).
- Leroy JL. 2015. Measuring the Food Access Dimension of Food Security: A Critical Review and Mapping of Indicators. *Food and Nutrition Bulletin*. 36: 167–95. Available from <https://doi.org/10.1177/0379572115587274> (accessed 2015).
- Lin TK. Kafri R. Hammoudeh W. Mitwalli S. Jamaluddine Z. Ghattas H. Giacaman R. Leone T. 2021. Food insecurity in the context of conflict: analysis of survey data in the occupied Palestinian territory. *The Lancet*, 398, S35. Available from [https://doi.org/10.1016/S0140-6736\(21\)01521-X](https://doi.org/10.1016/S0140-6736(21)01521-X) (accessed 2021).
- Lin TK. Kafri R. Hammoudeh W. Mitwalli S. Jamaluddine Z. Ghattas H. Giacaman R. Leone T. 2021. Food insecurity in the context of conflict: analysis of survey data in the occupied Palestinian territory. *The Lancet*, 398, S35. Available from [https://doi.org/10.1016/S0140-6736\(21\)01521-X](https://doi.org/10.1016/S0140-6736(21)01521-X) (accessed 2021).
- Lockman. 2005. Intifada: The Palestinian Uprising Against Israeli Occupation - Google Books. Available from https://books.google.cz/books?hl=en&lr=&id=KYPVNdzXUJkC&oi=fnd&pg=PA4&dq=israeli+occupation+of+palestine&ots=AoAOpouzLy&sig=4yr1LuT0s2UHCw2jxrtYzteR3M4&redir_esc=y#v=onepage&q=israeli%20occupation%20of%20palestine&f=false (accessed 2005).
- .Jazousi MA.AbuHatash S. 2008. EVALUATION OF WATER MANAGEMENT OPTIONS FOR MORE . Retrieved from International Water Technology Conference. Available from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.559.6356&rep=rep1&type=pdf> (accessed 2008).
- Marefa L. 2007. Hamas Leader Condemns Islamist Charity Blacklist. Available from http://www.reuters.com/article/homepageCrisis/idUSL23611943._CH_.2400 (accessed August 2007).
- Mason M. 2013. Climate change, securitisation and the Israeli-Palestinian conflict. In Source: *The Geographical Journal* (Vol. 179, Issue 4).
- Mason M. 2013. Climate change, securitisation and the Israeli-Palestinian conflict. In Source: *The Geographical Journal* (Vol. 179, Issue 4).
- Mason M. Zeitoun M. Mimi Z. 2012. Compounding vulnerability: Impacts of climate change on palestinians in Gaza and the West Bank. *Journal of Palestine Studies*, 41(3), 38–53. Available from <https://doi.org/10.1525/jps.2012.XLI.3.38> (accessed 2012).
- Mason M. Zeitoun M. Mimi Z. 2012. Compounding vulnerability: Impacts of climate change on palestinians in Gaza and the West Bank. *Journal of Palestine Studies*, 41(3), 38–53. Available from <https://doi.org/10.1525/jps.2012.XLI.3.38> (accessed 2012).

- Mason M. Zeitoun M. Sheikh R. 2011. Conflict and social vulnerability to climate change: Lessons from Gaza. *Climate and Development*, 3(4), 285–297. Available from <https://doi.org/10.1080/17565529.2011.618386> (accessed 2011).
- Mason M. Zeitoun M. Sheikh R. 2011. Conflict and social vulnerability to climate change: Lessons from Gaza. *Climate and Development*, 3(4), 285–297. Available from <https://doi.org/10.1080/17565529.2011.618386> (accessed 2011).
- Massad S, Deckelbaum RJ, Medhin MG, Holleran S, Dary O, Obeidi M, Bordelouis P, Khammash U, Alrazy H. 2016. Double Burden of Undernutrition and Obesity in Palestinian Schoolchildren: A Cross-Sectional Study. *Food and Nutrition Bulletin* 37: 144–52. Available from <https://doi.org/10.1177/0379572116637720> (accessed 2016).
- MPPN. 2020. Multidimensional Poverty Profile in Palestine | MPPN. Available from <https://mppn.org/multidimensional-poverty-profile-in-palestine/> (accessed June 22, 2020).
- Mustafa MA. Mabhaudhi T. Massawe F. 2021. Building a resilient and sustainable food system in a changing world – A case for climate-smart and nutrient dense crops. *Global Food Security*, 28. Available from <https://doi.org/10.1016/j.gfs.2020.100477> (accessed 2021).
- Mustafa MA. Mabhaudhi T. Massawe F. 2021. Building a resilient and sustainable food system in a changing world – A case for climate-smart and nutrient dense crops. *Global Food Security*, 28. Available from <https://doi.org/10.1016/j.gfs.2020.100477> (accessed 2021).
- NASA. 2022. NASA: Climate Change and Global Warming. Available from <https://climate.nasa.gov/> (accessed 2022).
- Natsheh. 2012. Climate change. Available from file:///C:/Users/HP/OneDrive%20-%20CZU%20v%20Praze/Plocha/thesis/food%20security%20factors/--.pdf (accessed 2012).
- Natsheh. 2012. Climate change. Available from file:///C:/Users/HP/OneDrive%20-%20CZU%20v%20Praze/Plocha/thesis/food%20security%20factors/--.pdf (accessed 2012).
- Occupied Palestinian Territory. (2008). Retrieved from FAO AQUASTAT: <http://www.fao.org/3/CA0348EN/ca0348en.pdf>
- Occupied Palestinian Territory. (2008). Retrieved from FAO AQUASTAT: <http://www.fao.org/3/CA0348EN/ca0348en.pdf>
- OCHA. 2015. “Concern about the Increasing Deterioration in Food Security and the Quality of Services in the Gaza Strip.” 2015. Available from <https://www.ochaopt.org/ar/content/concern-over-further-deterioration-food-security-and-quality-services-gaza-strip-0> (accessed 2021).
- PCBS. 2014. The Reality of Food Security in Palestine | Palestinian Central Bureau of Statistics. Available from <https://www.pcbs.gov.ps/postar.aspx?lang=ar&ItemID=1134> (accessed 2014).

- PCBS. 2017. Palestinian Central Bureau of Statistics. Available from https://www.pcbs.gov.ps/site/lang__ar/741/default.aspx (accessed 2017).
- PCBS. 2017. PCBS | National Accounts (GDP) | Palestinian Central Bureau of Statistics. Available from https://www.pcbs.gov.ps/site/lang__en/741/default.aspx (accessed 2017).
- PCBS. 2019. Palestinian Statistics and Water Authority | Palestinian Central Bureau of Statistics. Available from <https://www.pcbs.gov.ps/postar.aspx?lang=ar&ItemID=3689> (accessed 2019).
- PCBS. 2020. The Palestinian Central Bureau of Statistics Announces the Preliminary Estimates of the Quarterly National Accounts for the Fourth Quarter of 2019 | Palestinian Central Bureau of Statistics.
- PCBS. 2022a. Palestinian Central Bureau of Statistics. Available from <https://www.pcbs.gov.ps> (accessed 2022).
- PCBS. 2022b. PCBS | Statistics | Palestinian Central Bureau of Statistics. Available from https://www.pcbs.gov.ps/site/lang__en/507/default.aspx (accessed 2022)
- PLO. 2022. Palestinian National Liberation Movement / Fatah | Palestine Liberation Organization. Available from <http://www.plo.ps/category/113/1/> (accessed 2022).
- Policy Brief. 2006. Food Security. Policy Brief. Available from https://mrag.co.uk/sites/default/files/fmispdocs/fmispbrief3_food_security.pdf (accessed January 2006).
- Radwan A. Radwan E. Radwan W. 2021. Eating habits among primary and secondary school students in the Gaza Strip, Palestine: A cross-sectional study during the COVID-19 pandemic. *Appetite*, 163, 105222. Available from <https://doi.org/10.1016/J.APPET.2021.105222> (accessed 2021).
- Radwan A. Radwan E. Radwan W. 2021. Eating habits among primary and secondary school students in the Gaza Strip, Palestine: A cross-sectional study during the COVID-19 pandemic. *Appetite*, 163, 105222. Available from <https://doi.org/10.1016/J.APPET.2021.105222> (accessed 2021).
- Rajoub A. 2021. Israel's 2021 Aggression on Gaza. Timeline. Available from <https://www.aa.com.tr/> (accessed April 13, 2021).
- Romano D. Stefani G. Rocchi B. Fiorillo C. 2019. The impact of assistance on poverty and food security in a fragile and protracted-crisis context: The case of west bank and gaza strip. *Bio-Based and Applied Economics*, 8(1), 21–61. Available from <https://doi.org/10.13128/bae-8145> (accessed 2019).
- Romano D. Stefani G. Rocchi B. Fiorillo C. 2019. The impact of assistance on poverty and food security in a fragile and protracted-crisis context: The case of west bank and gaza strip. *Bio-Based and Applied Economics*, 8(1), 21–61. Available from <https://doi.org/10.13128/bae-8145> (accessed 2019).
- Roy S. 1988. The Gaza Strip: Critical Effects of the Occupation on JSTOR. Available from https://www.jstor.org/stable/41857956?seq=1#metadata_info_tab_contents (accessed 1988).

- Sablani SS. Kasapis MS. Rahman F. 2005. Evaluating Water Activity and Glass Transition Concepts for Food Stability. Available from doi:10.1016/j.jfoodeng.2005.09.025 (accessed 2005).
- Salima O. 2018. The Palestinian-Israeli Demographic Conflict 1920-1949. Available from <http://dspace.univ-msila.dz:8080//xmlui/handle/123456789/6494> (accessed June 24, 2018).
- Samar Ghazal Musmar, M. F. (2012, April 23). Breastfeeding Patterns among Palestinian Infants in the First 6 Months in Nablus Refugee Camps: A Cross-Sectional Study. Retrieved from journal of human lactation : <https://journals.sagepub.com/doi/10.1177/0890334411432715>
- Samar Ghazal Musmar, M. F. (2012, April 23). Breastfeeding Patterns among Palestinian Infants in the First 6 Months in Nablus Refugee Camps: A Cross-Sectional Study. Retrieved from journal of human lactation : <https://journals.sagepub.com/doi/10.1177/0890334411432715>
- Sarma J. 2022. The Issue of Food Security in the Middle East. Available from https://www.researchgate.net/publication/355037635_The_Issue_of_Food_Security_in_the_Middle_East (accessed 2022).
- Sarma J. 2022. The Issue of Food Security in the Middle East. Available from https://www.researchgate.net/publication/355037635_The_Issue_of_Food_Security_in_the_Middle_East (accessed 2022).
- Shadeed S. Judeh T. Riksen M. 2020. Rainwater harvesting for sustainable agriculture in high water-poor areas in the West Bank, Palestine. *Water (Switzerland)*, 12(2). Available from <https://doi.org/10.3390/w12020380> (accessed 2020).
- Shadeed S. Judeh T. Riksen M. 2020. Rainwater harvesting for sustainable agriculture in high water-poor areas in the West Bank, Palestine. *Water (Switzerland)*, 12(2). Available from <https://doi.org/10.3390/w12020380> (accessed 2020).
- Shelby D. 2022. Production and Food Utilization in a Population of Bluegill Sunfish. Available from <https://www.jstor.org/stable/1942360> (accessed February 5 2022).
- Shirin Aliabadi, M. (2019, March). Retrieved from The Lancet: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(19\)30594-X/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)30594-X/fulltext)
- Shirin Aliabadi, M. (2019, March). Retrieved from The Lancet: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(19\)30594-X/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)30594-X/fulltext)
- Smith MD. Floro MS. 2020. Food insecurity, gender, and international migration in low- and middle-income countries. *Food Policy*, 91, 101837. Available from <https://doi.org/10.1016/J.FOODPOL.2020.101837> (accessed 2020).
- Smith MD. Floro MS. 2020. Food insecurity, gender, and international migration in low- and middle-income countries. *Food Policy*, 91, 101837. Available from <https://doi.org/10.1016/J.FOODPOL.2020.101837> (accessed 2020).
- State of Palestine. (n.d.). Retrieved from global nutrition report: <https://globalnutritionreport.org/resources/nutrition-profiles/asia/western-asia/state->

palestine/#~:text=The%20prevalence%20of%20overweight%20children,progress%20a
gainst%20increasing%20the%20figure.

State of Palestine. (n.d.). Retrieved from global nutrition report:
[https://globalnutritionreport.org/resources/nutrition-profiles/asia/western-asia/state-palestine/#~:text=The%20prevalence%20of%20overweight%20children,progress%20a
gainst%20increasing%20the%20figure](https://globalnutritionreport.org/resources/nutrition-profiles/asia/western-asia/state-palestine/#~:text=The%20prevalence%20of%20overweight%20children,progress%20a%20gainst%20increasing%20the%20figure).

State of Palestine. 2014. FOOD INSECURITY IN PALESTINE REMAINS HIGH | State of Palestine.
Available from <https://www.pcbs.gov.ps/post.aspx?lang=en&ItemID=1135> (accessed
June 2014).

State of Palestine. 2018. Socio-Economic and Food Security Survey. Available from
[https://fscluster.org/sites/default/files/documents/socio-
economic_food_security_survey_sefsec_2018_full_repor_02.09t.pdf](https://fscluster.org/sites/default/files/documents/socio-economic_food_security_survey_sefsec_2018_full_repor_02.09t.pdf) (accessed 2018).

Tabar L. 2020. Disrupting Development, Reclaiming Solidarity: The Anti-Politics of
Humanitarianism. Available from <https://doi.org/10.1525/Jps.2016.45.4.16> 45 (4):
16–31. <https://doi.org/10.1525/JPS.2016.45.4.16> (accessed 2020).

Tamimi. 2012. Climate Change and Security in the Israeli-Palestinian Context. *Journal of Peace
Research* 49: 241–57. <https://doi.org/10.1177/0022343311427575> (accessed 2012).

The world map. 2021. West Bank Map | Palestine | Detailed Maps of West Bank. Available
from <https://ontheworldmap.com/palestine/west-bank/> (accessed 2021).

Timmer P. 2012. Behavioral Dimensions of Food Security. *Proceedings of the National
Academy of Sciences of the United States of America* 109: 12315–20. Available from
<https://doi.org/10.1073/PNAS.0913213107> (accessed 2012).

Tina I. 2019. Against Violence Elderly the: Palestine. Available from
[https://palestine.unfpa.org/sites/default/files/pub-
pdf/violence_against_the_elderly_palestine.pdf](https://palestine.unfpa.org/sites/default/files/pub-pdf/violence_against_the_elderly_palestine.pdf). (accessed 2019)

UNICEF. 2021. Available from <https://www.unicef.org/what-we-do> (accessed 2021)

United Nations. 2014. United nations seminar on assistance to Palestinian people. United
Nations.

Unrwa . 2020. Available from [https://www.unrwa.org/ar/what-we-
do/%D8%A7%D9%84%D8%AE%D8%AF%D9%85%D8%A7%D8%AA](https://www.unrwa.org/ar/what-we-do/%D8%A7%D9%84%D8%AE%D8%AF%D9%85%D8%A7%D8%AA) (accessed 2020)

Unrwa . 2020. Available from [https://www.unrwa.org/ar/what-we-
do/%D8%A7%D9%84%D8%AE%D8%AF%D9%85%D8%A7%D8%AA](https://www.unrwa.org/ar/what-we-do/%D8%A7%D9%84%D8%AE%D8%AF%D9%85%D8%A7%D8%AA) (accessed 2022)

Unrwa . 2020. Available from https://www.unrwa.org/sdg_2020 (accessed 2020).

UNRWA. (2020). Retrieved from https://www.unrwa.org/sdg_2020

UNRWA. (2020). Retrieved from https://www.unrwa.org/sdg_2020

UNRWA. 2014. Food Insecurity in Palestine Remains High | United Nations Relief and Works
Agency. Available from [https://www.unrwa.org/newsroom/press-releases/food-
insecurity-palestine-remains-high](https://www.unrwa.org/newsroom/press-releases/food-insecurity-palestine-remains-high) (accessed January 3, 2014).

- UNRWA. 2019. More than One Million People in Gaza – Half of the Population of the Territory – May Not Have Enough Food by June | United Nations Relief and Works Agency. Available from <https://www.unrwa.org/newsroom/press-releases/more-one-million-people-gaza-%E2%80%93-half-population-territory-%E2%80%93-may-not-have> (accessed May 13, 2019).
- Wafa. 2022. Climate Elements | Palestinian National Information Center. Available from https://info.wafa.ps/ar_page.aspx?id=2409 (accessed 2022).
- Wafa. 2022. Geographical Location of Palestine. Available from https://info.wafa.ps/ar_page.aspx?id=2401 (accessed 2022).
- Wahib M. 2006. The Conflict Between Fateh & Hamas and Its Impact on the Peaceful Settlement From the View Point of Students of Political Science in The.
- WFP. 2020a. Palestine | World Food Programme. Available from <https://ar.wfp.org/countries/palestine> (accessed 2020).
- WFP. 2020b. Palestine | World Food Programme. Available from <https://www.wfp.org/countries/palestine> (accessed 2020).
- WFP. 2022. UN | World Food Programme. Available from <https://www.wfp.org/> (accessed April 3, 2022).
- WHO. 2020. Publications | World Health Organization . Available from <https://www.who.int/publications> (accessed 2020).
- Wishahi S. 2013. Resilience to Climate Change in Palestine The Fine Balance between Floods and Droughts international union for conservation of nature-regional office for west asia.
- World bank. 2021. GDP in Palestine | World Bank.
- World Bank. 2021. MENA Has a Food Security Problem, But There Are Ways to Address It | World Bank. Available from <https://www.worldbank.org/en/news/opinion/2021/09/24/mena-has-a-food-security-problem-but-there-are-ways-to-address-it> (accessed 2021).
- World bank. 2022. GDP (Current US\$) - West Bank and Gaza | Data. Available from <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=PS> (accessed 2022).
- World Food Program. 2019. Food Security in the Occupied Palestinian Territories |
- Worldbank. West Bank and Gaza | Data. World Bank. Available from <https://data.worldbank.org/country/west-bank-and-gaza> (accessed 2021).
- Worldometer. 2022. State of Palestine Population (2022) | Worldometer. Available from <https://www.worldometers.info/world-population/state-of-palestine-population/> (accessed February 12, 2022).