GLOBAL POLITICS OF FOOD SECURITY

A THESIS SUBMITTED TO THE GRADUATE SCHOOL OF SOCIAL SCIENCES OF MIDDLE EAST TECHNICAL UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN THE DEPARTMENT OF INTERNATIONAL RELATIONS

SEPTEMBER 2022

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ABSTRACT

GLOBAL POLITICS OF FOOD SECURITY

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September 2022, 207 pages

Food is one of the most basic needs of humanity and is a central issue in national and international policies. As food is essential in International Relations, history has witnessed numerous food-related problems. In particular, food crises, hunger, rising food prices, and environmental deterioration, which have come to the fore since the 1970s, have shaped the issue of food security. Thus, the multi-dimensional, multi-level, and complex nature of food security has become more critical while facing numerous global challenges. In this respect, the primary purpose of the thesis is to argue that the existing mechanisms and international institutions for ensuring food security are not capable of coping with the emerging global challenges to food security. Specifically, the ups and downs of the global economic system, climate change impacts, production techniques such as GM and organic, pandemics such as COVID-19, and regional conflicts such as the Ukraine-Russia War create new global challenges that require global solutions and joint responses. Therefore, this study shows that such international mechanisms are not yet developed.

Keywords: Food Security, International Relations, FAO, Sustainability, Development

ÖZ

KÜRESEL GIDA GÜVENLİĞİ SİYASETİ

GENÇ, Barış Emre Yüksek Lisans, Uluslararası İlişkiler Bölümü Tez Yöneticisi: Prof. Dr. Oktay TANRISEVER

Eylül 2022, 207 Sayfa

Gıda, insanlığın en temel ihtiyaçlarından birisi ve ulusal ve uluslararası politikalarda merkezi bir konudur. Uluslararası İlişkilerin olmazsa olmaz önemli bir konusu olan gıda, tarih boyunca çok sayıda problem ve zorlukla karşı karşıya kalmıştır. Özellikle 1970'li yıllardan itibaren sıklıkla gündeme gelen gıda krizleri, açlık, artan gıda fiyatları ve çevresel bozulmalar gıda güvenliği meselesini şekillendirmiştir. Bu nedenle, gıda güvenliğinin çok boyutlu, çok düzeyli ve karmaşık doğası, sayısız küresel zorlukla karşı karşıya kalırken daha kritik hale gelmektedir. Bu bağlamda, tezin temel amacı, gıda güvenliğini sağlamaya yönelik mevcut mekanizmaların ve uluslararası kurumların, gıda güvenliğine yönelik ortaya çıkan küresel zorluklarla başa çıkamadıklarını iddia etmektir. Spesifik olarak, küresel ekonomik sistemdeki iniş çıkışlar, iklim değişikliğinin etkileri, GDO ve organik gibi üretim teknikleri, COVID-19 gibi pandemiler ve Ukrayna-Rusya Savaşı gibi bölgesel çatışmalar, küresel çözümler ve ortak tepkiler gerektiren yeni küresel zorluklar yaratmaktadır. Dolayısıyla bu çalışma, bu tür uluslararası mekanizmaların henüz gelişmediğini göstermektedir.

Anahtar Kelimeler: Gıda Güvenliği, Uluslararası İlişkiler, FAO, Sürdürülebilirlik, Kalkınma To my dear parents, Birgül and Cemil GENÇ

ACKNOWLEDGMENT

I would like to state my sincere thanks to my thesis advisor, Prof. Dr. Oktay Tanrısever, for his endless support, patience, and guidance that has always encouraged me throughout my writing process. I also would like to thank my thesis committee members, Assoc. Prof. Dr. Murat Önsoy and Assoc. Prof. Dr. Burak Tangör from Hacettepe University, for their valuable time and significant contribution to my thesis.

I would like to express my endless thanks and respect to my dear friends for believing in me and their unwavering support throughout the thesis. I would like to thank with all my heart; the precious Merve Kala and Ateş Furkan Aydın, with whom I went through this challenging process; Miray Kotil and Ceren Çopur, who make me feel that they are always with me wherever I am; Ozan Altan, Merve Aydınlı and Pınar Gatgar, who have always encouraged me not to give up.

Last but not least, I would like to thank my precious mother, father, brother, and aunt for their support, understanding, and trust. My mother, Birgül, I could not even start this process without you.

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LIST OF ABBREVIATIONS

ASEAN	The Association of Southeast Asian Nations
BRICS	Acronym of Brazil, Russia, India, China, and South Africa
CGIAR	The Consultative Group for International Agricultural Research
COVID-19	Coronavirus disease
EC	The European Community
ECOSOC	The United Nations Economic and Social Council
EFSA	The European Food Safety Authority
EPTA	The Expanded Program for Technical Assistance
EU	The European Union
FAFA	The Financial and Administrative Framework Agreement
FAO	The Food and Agriculture Organization
GATT	The General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GM	Genetically Modified
GMO	Genetically Modified Organisms
IFAD	The International Fund for Agricultural Development
IMF	The International Monetary Fund
IPCC	The Intergovernmental Panel on Climate Change
IR	International Relations
MENA	Middle East and North Africa (Region)
NASA	The National Aeronautics and Space Administration
NDCs	Nationally Determined Contributions
OECD	The Organization for Economic Co-operation and
	Development
PNAE	The National School Feeding Program
PNSAN	The National Food and Nutritional Security Policy

PWB	The Programme of Work and Budget
SDGs	The Sustainable Development Goals
UDHR	The Universal Declaration of Human Rights
UK	The United Kingdom
UN	The United Nations
UNDP	The United Nations Development Programme
UNEP	The United Nations Environment Programme
UNHCR	The United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
US	The United States
USA	The United States of America
USAID	The United States Agency for International Development
USDA	The United States Department of Agriculture
USSR	The Union of Soviet Socialist Republics
WFP	The World Food Programme
WHO	The World Health Organization
WIC	The Special Supplemental Nutrition Program for Women,
	Infants, and Children
WTO	The World Trade Organization

CHAPTER 1

INTRODUCTION

1.1. Scope and Objective

The primary purpose of this thesis is to argue that the emerging challenges to food security are insufficient to be solved by existing mechanisms and international institutions. Since food is the most basic need of humanity, it comes to the fore in international and national political areas. This thesis shows that the meaning and understanding of food have evolved historically by emphasizing the development of food in the discipline of International Relations. Therefore, Food security is a multidimensional and complex issue with its development as a prominent issue at national, international, and even household levels, especially in the security field. While this study highlights countries' policies, strategies, and government programs to ensure food security, it also includes the policies of international organizations, specifically FAO. Finally, this study analyzes the emerging global challenges to ensure food security, such as emerging new challenges, ups and downs in the global economy, climate change, GMO and organic production techniques, pandemics such as COVID-19, and regional wars such as the Ukraine-Russia War.

1.2. Research Question and Argument

The research question of the thesis is; "Are the existing mechanisms to ensure food security capable of coping with emerging global challenges to food security?" Based on this historical and political context, along with current approaches and developments at international and national levels, this thesis argues that existing mechanisms and institutions in international relations are not capable of ensuring food

security. Since the dynamics of technology, ups and downs in the global economic system, pandemics like COVID-19, climate change impacts, and regional conflicts such as the Ukraine-Russia War create new global challenges which necessitate global solutions and joint responses. However, contrary to the arguments of several experts' and views of several scholars who discussed that food security could be ensured with the existing mechanisms and institutions in international relations are not capable enough. Thus, this study shows that such international mechanisms are not developed yet.

The thesis indicates that food security is a prominent policy that shapes national and international policy and is a vital issue that has become increasingly dominant due to emerging challenges, as mentioned above. Food security is always an essential issue due to the involvement of the various problems. In this study, it is argued that the existing mechanisms and international institutions are not sufficient and effective enough to cope with the emerging global challenges that highly affect the complex and multidimensional nature of food security. Thus, the thesis also contributes to the existing Food Security literature, showing that there are rising challenges but still a lack of a global mechanism to end food security.

1.3. Literature Review

Food represents one of the most basic needs of humankind. It is a crucial source of energy for the continuity of life for humanity. It cannot be replaced by another substitute¹. Food-related issues have always been prominent throughout history. More than 10,000 years ago, humans began gathering and settling to feed themselves by seeding, cultivating crops, and hunting animals². Like other humanitarian necessities

¹ Sharon Friel and Laura Ford, "Systems, Food Security and Human Health," Food Security 7, no. 2 (2015): 437–51.

²Getz, Trevor, and O'connor Bridgette Byrd. "The Earliest Humans:Foragers and 2

such as water and a place to live, food has long been a matter between people, communities, and nations. As can be seen in Maslow's hierarchy of needs, it is possible to reach the upper levels by meeting the basic food³. In International Relations, the right to food emerges as an essential term. As United Nations defines, "everyone has the right to a standard of living adequate for the health... including food... "⁴ However, it is not just a right to reach enough food but also to reach simply stable and nutritious food economically. Moreover, it has been a crucial issue in debates where economic, environmental, and social challenges have been rising and creating significant impacts on the food security agenda.

As Food is essential in International Relations, history has witnessed numerous foodrelated issues. Food led Western civilizations to find a new continent where they tried to reach resources of spices under the Ottomans' control⁵, or improvements in technology had led to an increase in agricultural production but resulted in environmental degradation due to extensive water and fertilizer usage. Moreover, the rising population in the world also creates a significant issue because countries need to feed the people. Countries always strive to enhance food production and benefit from control of more arable land. They are the primary source for feeding the population while eliminating hunger and poverty. Thus, they can settle the social unrest and increase more food-secure population. However, food security is highly complex, multilevel, and multidimensional⁶. It challenges countries in several

Gatherers." World History Project, (2020), 4-6.

³ Jon Barnett, "Reclaiming Security," Peace Review 9, no. 3 (1997): 405–10.

⁴United Nations, "United Nations Universal Declaration of Human Rights," *Applied Ethics: A Multicultural Approach: Sixth Edition*, (1948), 54–57.

⁵ Đana Luša and Ružica Jakešević, "The Role of Food in Diplomacy: Communicating and 'Winning Hearts and Minds' Through Food," *Medijske Studije* 8, no. 16 (2017): 99–118

⁶ Adelphi Series, "Chapter One: Understanding Food Security," 53, no. 441–442 (2013): 23–48

interrelated areas, from agricultural production to adaptation to climate change effects, from stabilizing domestic food prices to reducing global food supply chain disruptions.

Food security is at the core of all those food-related issues and crises. It has been at the center of academic, political, and environmental debates long enough. For this reason, there are lots of definitions and perspectives of food security. However, the most known definition of food security is FAO's definition. It defines when all individuals have safe, affordable, and stable access to adequate food to fulfill their nutritional needs in their active life⁷. Additionally, food security is classified into four dimensions as follows: availability, accessibility, utilization, and stability of food⁸. Those are also called pillars of food security. They present a broader picture for understanding food security and shape its meaning regarding various challenges. Those are closely related to critical areas such as the environment, economics, social, and health at household, national and international levels. They quickly affect one another in a country under the changing circumstances in the international area.

The perceptions and conceptualizations of food security have evolved due to its complex nature⁹. Specifically, rising environmental problems have attracted public and academic concerns since the 1970s¹⁰. Food-related issues such as the 1973 food crisis, food shortages resulting from drought, the petrol crisis that caused a rise in food prices, and trade barriers and quotas on agricultural products began to shape the food

⁷ FAO, "*Rome Declaration on World Food Security and World Food Summit Plan of Action*". (1996). Available online at: <u>http://www.fao.org/DOCREP/003/W3613E/W3613E00.HTM</u> (accessed on January 08, 2022)

⁸ FAO, "Declaration of the World Summit on Food Security". (Rome: FAO, 2009).

⁹ Simon Maxwell, "Food Security: A Post-Modern Perspective," *Food Policy* 21, no. 2 (1996): 155–70

¹⁰ Renner, Michael. "Environmental Security: The Policy Agenda." *Conflict, Security & Development* 4, no. 3 (2004): 313–34.

security agenda¹¹. Additionally, the connection between security and food became deeper and widener. Even though the focus was on nuclear powers, conflicts, and wars in a bipolar world during the Cold War era, food security challenges such as rising food prices, environmental problems, energy crises, etc., were still influential in the politics at the national and international levels.

Following the end of the Cold War era, The United Nations and FAO increasingly focused on non-military such as economic and environmental sources that threaten peace and security in a global sense. 1994 UN Human Development Report stated that food and human security are closely related because rising temperatures, food shortages, and natural destruction have brought threats¹². Moreover, the 1996 World Food Summit was the top point for ensuring food security at the international level¹³. The search for solutions for hunger and poverty in the global area became prominent. With the establishment of the World Trade Organization, countries focused on fair trade and the movement of agricultural products without restrictions and trade barriers to reduce hunger and poverty¹⁴. However, it served more agricultural exporter countries and could not end hunger in many parts of the world. It is also seen that countries first focused on protecting themselves due to rising food prices and food shortages in the international area¹⁵. Even though international organizations have

¹¹ Alison Small and O'Broin Síle, "70 Years of FAO: 1945-2015" (Rome: FAO Office for Corporate Communication, 2015).

¹² I. Orlova, Y. Streltsova, and E. Skvortsova, "The UN 1994 Human Development Report Presents Concrete Proposals for the Social Summit," *Refuge: Canada's Journal on Refugees* 14, no. 2 (1994): 18–20

¹³ Jessica Duncan, "The Evolution of Global Food Security Policy," *Global Food Security Governance*, 2018, 42–83

¹⁴ Friel, Sharon and Ford, Laura . "Systems, Food Security and Human Health," *Food Security* 7, no. 2 (2015): 437–51

¹⁵ Tim Lang and John Ingram, "Food Security Twists and Turns," Addressing Tipping Points for a Precarious Future, 2013, pp. 81-103

expressed their desire to reduce barriers and encourage more cooperation, countries' response has not been quick and effective as expected.

Additionally, FAO is also an essential player in international politics to ensure food security¹⁶. Concerns about food and agriculture led to the establishment of FAO and created a significant step for joint responses in International Relations. The main problem is that member states are equally represented at the Conference, which is the policymaking organ of FAO¹⁷, and there is still a lack of supranational authority. Members have influenced FAO's agenda on different topics, acting from time to time according to their national interests¹⁸. Even though FAO offers more cooperation and open communication among the members, it is seen that national interests and power struggles still exist. It is seen that donor or exporter countries have impacted the FAO's directions¹⁹. For instance, as a resource partner of FAO, China supports the problems in its own country²⁰. It supports specifically rice and soybean production in the project that it funds. Like the EU as a resource partner of FAO, it funded Ukraine's grain and wheat production programs by improving infrastructure and modernizing because Ukraine is the breadbasket of Europe²¹.

¹⁶Alison Small and O'Broin Síle, "70 Years of FAO: 1945-2015" (Rome: FAO Office for Corporate Communication, 2015).

¹⁷ FAO and United Nations, "Basic Texts of the Food and Agriculture Organization of the United Nations." I–II: 245. (2017)

¹⁸ Nora McKeon, "Food Governance: a Rapid Historical Review," in *Food Security Governance: Empowering Communities, Regulating Corporations*, ed. Nora McKeon (Taylor & Francis, 2015), pp. 11-30.

¹⁹ Amalia Ribi Forclaz,. "From Reconstruction to Development: The Early Years of the Food and Agriculture Organization (FAO) and the Conceptualization of Rural Welfare, 1945-1955." *International History Review* 41, no. 2 (2019): 351–71

²⁰ FAO, "Resources, Partnerships – Impact 2020". (Rome:FAO, 2020)

²¹ FAO, "The State of Agricultural Commodity Markets 2022". (Rome: FAO, 2022)

The national-level food security policies of the four countries, the USA, China, Egypt, and Brazil, are specified. The primary purpose of choosing these countries is that they have different levels of development, economy, and approaches to ensuring food security, and are also located on different continents. The basic approaches of these four countries to ensure food security include various dimensions of food security²². While an essential agricultural exporter like Brazil contributes significantly to environmental degradation²³, Egypt has been experiencing social unrest in the face of rising global food prices due to its dependence on food supply²⁴. As China is a major agricultural exporter, it increasingly imports agricultural products to feed its growing population and buys land in different countries to produce more crops there²⁵. The USA, on the other hand, has been an essential player in issues such as the continuity of agricultural production, coping with disasters such as drought and flood, and the continuity of global food supply by allocating large shares to the field of agriculture and food over the years²⁶. They are included in this study because these countries adopt different approaches in the face of difficulties in ensuring food security. Moreover, these countries' agricultural and food policies have been shaped in the face of various challenges at the national and global level. Thus, these countries' political economy, environmental, and social situations in food availability, accessibility, utility, and

²² OECD, "Agricultural Policy Monitoring and Evaluation 2021: Addressing the Challenges Facing Food Systems", (Paris: OECD Publishing, 2021).

²³ OECD, "Innovation, Agricultural Productivity and Sustainability in Brazil", (Paris: OECD Publishing, 2015)

²⁴ Tellioglu, Isin, and Panos Konandreas, "Agricultural Policies, Trade and Sustainable Development in Egypt". (Geneva: International Centre for Trade and Sustainable Development (ICTSD) and Rome: United Nations Food and Agriculture Organization (FAO), 2017).

²⁵ Brooke Jardine, "Food Security in China: Challenges, Policies, and Projections," *Journal of Chinese Politics, National Security, and Foreign Affairs*, 2021, pp. 83-94

²⁶ OECD, "Agricultural Policy Monitoring and Evaluation 2021: Addressing the Challenges Facing Food Systems", (Paris: OECD Publishing, 2021), pp. 561-580

stability are defined, and their reflections and effects on agriculture and food policies are detailed. By showing the changing policies of countries, how food security emerges as a central policy at the national level is indicated by various indicators. However, food security is always a matter of country, but existing mechanisms still are not enough to cope with food security.

This thesis defines challenges as follows; economic and market, environmental, technical, pandemics such as COVID-19, and wars such as the Ukraine-Russia War. It is a basic expectation to see global food security as a common challenge and to attract joint action in the global area. However, countries are primarily concerned with national food security and can put cooperation into the second plan. For instance, a pandemic such as COVID-19 or a war between two major food-exporting countries can severely affect global food security²⁷. In this respect, a country's first and primary purpose is to restrict trade activities regarding health concerns or to prevent food-gap by increasing agricultural production capacity. In the international area, it is inevitable for countries to pursue national policies primarily. Although national responses are tried to be given to the global food security threats, interdependencies and common concerns show the need for cooperation and diplomacy. This cooperation and dialogue, which FAO frequently mentions²⁸, contribute to the development of the discourse on food security. FAO keeps underlining regional and global collaboration and specifies the strategies and programs for the problems that create food security. Therefore, the power struggle in the international area and the different interests of countries is an obstacle for FAO to act effectively. Problems such as the focus of states on their agendas and the absence of a supranational authority in the international arena show that they are insufficient to cope with the challenges of food security, and threats to food security may continue. More importantly, increases in global food prices

²⁷ FAO, "Ukraine: Note on the impact of the war on food security in Ukraine – 25 March" (Rome: FAO, 2022)

²⁸ Arild Aurvåg Farsund, Carsten Daugbjerg, and Oluf Langhelle. "Food Security and Trade: Reconciling Discourses in the Food and Agriculture Organization and the World Trade Organization." *Food Security* 7, no.2: (2015) 383–91

endanger households' access to food within a country, especially in developing countries that depend on food imports. Households with very high food expenditures cause social unrest in the country in the face of rising food prices²⁹. Moreover, the instability of food supply and demand in the global food market triggers global concerns³⁰. It is seen that food importing countries can be easily affected by the instability in the global food market. This puts food security at risk.

In terms of environmental challenges, the increase in the effects and intensity of climate change, and the pressure on water and land resources, which are essential elements of agricultural production and food systems, affect food security³¹. Providing suitable temperature, rich land, and sufficient water, which is especially important for agricultural production, is one of the environmental challenges³². Considering that "food availability" is the most crucial factor in food security, environmental challenges pose a significant danger to these pillars. Although this is seen as the responsibility of the countries, the environmental challenge requires both a global and a national response, which is also very effective in the global arena³³. In the global area, international organizations such as FAO and the UN are working extensively to combat climate change and its effects on food security³⁴. In particular, although FAO

²⁹ Woertz Eckart et al.. "The Impact of Food Price Volatility and Food Inflation on Southern and Eastern Mediterranean Countries." *Economics*, 2: (2014) pp.1–9.

³⁰ Adam Prakash and Christopher L. Gilbert, "Rising vulnerability in the global food system: beyond market fundamentals". In *Safeguarding food security in volatile global markets* (2011): 42–63

³¹ John Lienhard et al. "Climate Change, Agriculture, Water, and Food Security: What We Know and Don't Know". 2019

³² IPCC, "Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability", (Cambridge: IPCC, 2014) pp. 1-32

³³ Munir A. Hanjra and M. Ejaz Qureshi, "Global Water Crisis and Future Food Security in an Era of Climate Change," *Food Policy* 35, no. 5 (2010): pp. 365-377

³⁴ FAO, "Coping with climate change – the roles of genetic resources for food and agriculture." (Rome:FAO, 2015).

supports regional cooperations and collaborations with investments and financial and technical aid, countries' adaptation and mitigation targets may also be insufficient to combat the effects of climate change on food security. Specifically, the accumulation of GHGs in the atmosphere, one of the leading causes of climate change, continues to increase with countries' ineffective future targets. For instance, the first two global carbon emitter countries, China and the USA, contribute to the global food supply but also impact climate change's effects.

In terms of technical challenges, it primarily draws attention to the advantageous and disadvantageous situations between production with Genetically Modified Organisms and organic production. Various production techniques for the rapidly increasing global population come to the fore. GMO and organic production techniques, in which there are two different views, are popular. Therefore, some scholars have emphasized the success and necessity of GMOs³⁵, and some stress their concerns about GMOs, so they suggest organic production as a better way of ensuring food security³⁶. The most significant debate here is that although GMOs are an important technological advance³⁷, it creates public and political concerns in a country, considering health and environmental issues. Although organic agriculture is an essential technique for the environment and health³⁸ when the global cultivated areas are considered, it is

³⁵ Sven-Erik Jacobsen et al., "Feeding the World: Genetically Modified Crops versus Agricultural Biodiversity," *Agronomy for Sustainable Development* 33, no. 4 (2013): pp. 651-662

³⁶ Moussa Savadogo, "Environmental issues related to genetically modified crops in Africa". *Gates Open Res*, 2019

³⁷David Wield, Joanna Chataway, and Maurice Bolo, "Issues in the Political Economy of Agricultural Biotechnology," *Journal of Agrarian Change* 10, no. 3 (2010): pp. 342-366

³⁸ S. J. Khan et al., "Genetically modified organisms (GMOs): Food security or threat to food safety" *Pakistan Journal of Science*, *64*, no.2:(2012), pp. 85–92.

remarkable that it will be challenging to supply enough food for the entire world with organic agriculture, and the costs are high³⁹.

Additionally, pandemics such as COVID-19 and regional conflicts such as the Ukraine-Russia war have shaped food security policies and impacted the global food supply chain. First, the COVID-19 outbreak caused a pause and disruption at both international and national levels due to restrictions and bans imposed by countries⁴⁰. This emerges as a problem because it affects food systems, including the economic crisis, such as the decrease in the workforce and the incomes of households. Moreover, travel and trade restrictions, which follow one another by country, turn into a very problematic situation in terms of the supply of food. The countries' restrictions on prioritizing health conditions threaten food security at all levels. Countries already vulnerable to access to food are the first to be affected by disruptions and pauses⁴¹. Nevertheless, the effects of COVID-19 differ due to countries' economic situation and ability to respond quickly⁴².

Finally, although the Ukraine-Russia war entered the literature in the first quarter of 2022, it continues to discuss issues such as food security, food shortage, and the food supply chain. These challenges countries that have currently been trying to recover after COVID-19. Additionally, Russia and Ukraine are the most crucial agricultural exporters in the world, so it quickly affects lots of countries that import Russian and

³⁹ David W. Crowder and John P. Reganold, "Financial Competitiveness of Organic Agriculture on a Global Scale," *Proceedings of the National Academy of Sciences* 112, no. 24 (2015): pp. 7611-7616

⁴⁰ Jennifer Clapp and William G. Moseley, "This Food Crisis Is Different: COVID-19 and the Fragility of the Neoliberal Food Security Order," *The Journal of Peasant Studies* 47, no. 7 (November 2020): pp. 1393-1417

⁴¹ Mehmet Çalışkan, Ayten Yagız, and Caner Yavuz, "The Impact of COVID-19 on Agriculture," *Post-COVID Economic Revival* 2 (2022): pp. 97-113

⁴² Jennifer Clapp and William G. Moseley, "This Food Crisis Is Different: COVID-19 and the Fragility of the Neoliberal Food Security Order," *The Journal of Peasant Studies* 47, no. 7 (November 2020): pp. 1393-1417

Ukrainian agricultural products⁴³. On the other hand, it will lead other countries to take steps to fill the global food supply gap⁴⁴. For instance, the US and Brazil are essential agricultural exporters. Thus, their agricultural production for certain crops would be inevitable to eliminate the food gap and rising food prices but also match the economic interest. Yet, as long as the war between the two countries is not known when it will end, rising prices, decreasing food supply, and trade disruptions will continue to affect food security negatively⁴⁵.

1.4. Organization of the Thesis

Overall, seeking an answer to the research question of whether those existing mechanisms are capable of coping with the challenges of food security, this thesis will be structured as follows. This thesis consists of 6 chapters. The first chapter is the Introduction. Followed by Chapter 2, which defines food in International Relations. It describes the historical development of food and its relations with the security discipline in International Relations. It covers the food security concept in general and identifies the new challenges. Then, Chapter 3 describes FAO's historical emergence, organizational structure, and policies. This chapter details how FAO cooperates regionally and globally to highlight global food security as a prominent policy. It shows the conflicts and power struggles that affect the FAO's mechanism. After that, Chapter 4 identifies the policies, strategies, and government programs on food security

⁴³ Tim Lang and Martin McKee, "The Reinvasion of Ukraine Threatens Global Food Supplies," *BMJ*, 2022, pp.1-2

⁴⁴ Thomas Glauben et al., "The War in Ukraine, Agricultural Trade and Risks to Global Food Security," *Intereconomics* 57, no. 3 (2022): pp. 157-163.

⁴⁵ FAO, "The importance of Ukraine and the Russian Federation for global agricultural markets and the risks associated with the current conflict". <u>https://www.fao.org/3/cb9236en/cb9236en.pdf</u> (accessed on May 01, 2022)

in the USA, China, Egypt, and Brazil by expressing the different economic, geographical, social, and political conditions. It analyzes how they ensure food security under the existing mechanisms of countries. Then, Chapter 5 discusses the rising global challenges of food security. It shows different challenges that impact food security, such as volatility in food prices, instability in the food market, effects of climate change on rising temperatures, land resources and water scarcity, organic and GM productions, and pandemics such as COVID-19 and regional conflicts such as Ukraine-Russia War. Finally, the last chapter concludes all this work by stating the conclusion that the main argument is accurate. Thus, this chapter covers this thesis's conclusion and main findings by emphasizing that food security is prominent at the national and international levels, but existing mechanisms and international institutions are not capable enough of coping with emerging global challenges to food security.

CHAPTER 2

FOOD SECURITY IN INTERNATIONAL RELATIONS

2.1. Introduction

This chapter will highlight the fundamental concepts of food and present the essential background of food to evaluate how it became a security issue in International Relations. Hence, the first part will cover the food that is the basic need of humans. Fundamentally, the importance of food and how it evolves in different agendas try to be stressed. In the next part, security and environment nexus are discussed. This part will mention security and its close connection with environmental problems in history. The objective is to show how historical conditions have changed the meaning of security.

Then, the following part will argue the environmental and security aspects. Therefore, the purpose is to connect environmental security and food-related problems to apprehend the concept of food security. In the following part, various definitions and concepts on food security are stated. In particular, approaches to dimensions of food security and the changes in its definitions over time will be reviewed in the literature.

In the final part, the new challenges and new perspectives are highlighted. The goal here is to illustrate the discussions of new perspectives on which aspects of food security need to enhance along with new challenges impacting the complex structure of food security.

2.2. Definition and Background of Food

Food is a basic human need driven by the desire to eat for survival. Human beings need to maintain their body's functions, so the energy source comes from food. It cannot be replaced or substituted⁴⁶. Every living creature on earth needs energy to maintain its vital functions, which must be provided by the necessary food⁴⁷. It should be stated that food is a major element for the achievement of physiological needs and survival. Thus, an adequate and equal level of nutrition is important for people to maintain their lives. Food and adequate nutrition are connected to survival, physical, and mental health⁴⁸. As can be seen in Maslow's hierarchy of needs, it is emphasized primarily to meet the food, which is at the very base of the pyramid, for people to survive and to reach the needs located at the upper of the pyramid, such as security, love, and success⁴⁹. Along with nutrition, access to sufficient, high-quality, and secure food brings excellent significance. People can maintain their existence with the provision of access to food. If food is a need for people to survive, meeting this need in the highest quality and in a sustainable way appears as the most basic right⁵⁰. In this case, reaching adequate food throughout people's lives constitutes the basis of human rights. Furthermore, The Universal Declaration of Human Rights (UDHR) has identified the importance of food by stating: "Everyone has the right to a standard of living adequate for the health... including food..."51 Human rights are highly

⁴⁶ Peter Warr, "Food Insecurity and Its Determinants," *Australian Journal of Agricultural and Resource Economics* 58, no. 4 (2014): 519–37.

⁴⁷ Ibid. p.520

⁴⁸ Sharon Friel and Laura Ford, "Systems, Food Security and Human Health," *Food Security* 7, no. 2 (2015): 437–51.

⁴⁹ Abraham H Maslow, "A Theory of Human Motivation A Theory of Human Motivation," *Psychological Review* 50 (1943): 1–21.

⁵⁰ Lynn McIntyre and Krista Rondeau, "Food Security and Global Health," *Global Health and Global Health Ethics*, (2011), 261–73

⁵¹ United Nations, "United Nations Universal Declaration of Human Rights," *Applied Ethics: A Multicultural Approach: Sixth Edition*, (1948), 54–57.

interconnected and related to each other. The right to food is all-embracing other human rights. This right is of paramount importance for the existence of all other rights, and therefore violating the right to food can undermine many other human rights. It is not just a right to take the proper amount of nutrients and food but also to pursue the continuation of active life by achieving adequate, stable, and secure food. Moreover, it has become a major topic in the international debates where the economic, environmental, and social concerns on food have been rising and evolving into agendas in the era of mass consumption⁵².

Food-related issues have always been either subject or object throughout history. It is observed that food has created different interactions in many areas throughout history and is affected by several factors. It is possible to explain how these interactions are shaped by the close relationship between humans and food necessarily, and then emerge as a security element. This need-based relationship between humans and food has led people to come together to hunt and share food, and survive. More than 10,000 years ago, humans began to settle and gather for seeding, cultivating crops, and hunting animals⁵³. Systems were built upon food resources, production, and distribution in the earlier ages. Due to the fact that people need water and food to continue their lives, they have started to find more efficient resources and settle in the most suitable places where they can reach food sources. In time, communities tried to find new ways to reach new food resources or control them. Europeans, as an example, discovered a new continent while planning to find new ways to end the Ottoman monopoly⁵⁴ due to Ottoman's control over spices and trade routes. Moreover, even in the 20th century,

⁵²Zahir Irani and Amir M. Sharif, "Sustainable Food Security Futures: Perspectives on Food Waste and Information across the Food Supply Chain," *Journal of Enterprise Information Management* 29, no. 2 (2016): 171–78

⁵³Getz, Trevor, and O'connor Bridgette Byrd. "The Earliest Humans: Foragers and Gatherers." *World History Project*, (2020), 4–6.

⁵⁴Dana Luša and Ružica Jakešević, "The Role of Food in Diplomacy: Communicating and 'Winning Hearts and Minds' Through Food," *Medijske Studije* 8, no. 16 (2017): 99–118

during the Cold War, food had been used as a political tool because The USSR blocked roads, rails, and canals from any Western access to West Berlin. The Allies immediately organized to supply help to them by using an airlift. It can be seen that the role of food has constantly been evolving in different topics. Thus, it has become an essential topic in security issues and affected national policies.

2.3. Environmental and Security Aspects of Food

The concept of "security" is one of the main topics in International Relations. In general, security emerges as a basic desired concept. While expressing the idea of security, it has been tried to answer the questions of what it is and who it is for⁵⁵. Although the subject of security is universal, there is no specific definition of its meaning. Its meaning and application have changed over time, shaping new issues and other concepts. Security has long been associated with violence and war as if there were no additional security threats. Nevertheless, ensuring security can be seen as eliminating the conditions that pose a threat or danger to it. In Wolfers' perspective, security emphasizes a distinction between objective and subjective sense and expresses them as the absence of threats that will affect the acquired values and the absence of fear that will be created by any threats to these values⁵⁶. Likewise, the concept of security is expressed as "seeking to get rid of threats⁵⁷," "the absence of threats and

⁵⁵Jon Barnett, "Reclaiming Security," Peace Review 9, no. 3 (1997): 405–10.

⁵⁶Arnold Wolfers, "National Security Symbol, An Ambiguous," *Political Science Quarterly* 67, no. 4 (1952): 481–502.

⁵⁷Buzan, Barry, "People, "State and Fear: An Agenda for International Security Studies in the Post-Cold War Era", (Harlow, Londra: Pearson Longman, 1991). p.11

feeling safe⁵⁸," and "the highest end to easily seek goals such as peace and gain⁵⁹". This concept of security, which is at the center of attention in International Relations, can be dealt with at the individual, national, or global level. Although the concept has created a field that has been enriched with different disciplinary perspectives in recent years, it has been around concepts such as war and violence in the context of threats to national security for a long time. The most important reason for this was that states are the most powerful actors in the international arena and can only provide security themselves. The idea that the anarchic structure of the international arena creates an environment for states to pursue their national interests and power struggle becomes prominent. Therefore, the Realist perspective adopted a view that puts the state in the center and ignores some other elements by evaluating security based on power, threat, and interest⁶⁰. In particular, these areas have led to a hierarchical classification, which is seen as high politics. This classification of security separated high and low politics. Especially during the Cold War period, economic, environmental, and social issues were included in the low policy area. However, rising environmental and economic problems and public concerns during Cold War showed that the door was opened to these issues, which could be security issues. Even though these early attempts did not create a major break, still made a name in the discussions on these issues⁶¹. Since the late 1970s, the concept of security has been tried to be deepened in academic discussions. It has been tried to move the security agenda out of the military field, and many dimensions such as economic, environmental, and social have been brought to the agenda⁶². It can be seen that the Realist understanding of power and security is

⁵⁸Ken Booth, "Theory of World Security", ed. Steve Smith (Cambridge Studies in International Relations, 2007). p.100

⁵⁹Benjamin Shepherd, "Thinking Critically about Food Security," *Security Dialogue* 43, no. 3 (2012): 195–212.

⁶⁰Maria Julia Trombetta, "Environmental Security and Climate Change: Analysing the Discourse," *Cambridge Review of International Affairs* 21, no. 4 (2008): 585–602,.

⁶¹ Pınar Bilgin, "Security Studies: The Next Stage" 2, no. 84 (1998): 131–57.

⁶² Matthew, Richard A. "Environmental Security Demystifying the Concept Clarifying the Stakes," 1995, 14–24; Barry Buzan, Ole Wæver, and Jaap de Wilde. "Security A New

unsatisfying due to the changes in the international area after the Cold War period. However, the states are still the prominent actors in their strategies and policies.

There is an inseparable connection between humans and the environment. The environment has been an important part of life, but the improvements in technologies, rising consumption, overpopulation, etc., accelerated exploiting the environment and natural resources. Even in 1798, Thomas Malthus stressed his ideas in "An Essay on the Principle of Population". His study expressed that war, famine, and disease are not inevitable because of limited food and the human desire for their needs⁶³. Concerns over environmental problems had begun to be efficient in the late 1960s and early 1970s⁶⁴. Especially the environmental movement helped bring environmental problems to the agenda and paved the way for establishing connections between the environment and security. Environmental problems have been encountered in many areas throughout human history. Likewise, many works have drawn attention to the effects of environmental problems and created public opinion for the environmental movement. "Silent Spring" by Carson, "Population Bomb" by Ehrlich and "Limits to Growth" by Meadows et. al were notable works⁶⁵. They emphasized many neglected topics such as industrial growth, pesticides in agriculture, population growth, overconsumption, access to food, and food shortages. In addition, this connection was established between the environment and security in the following years in Richard Falk's "This Endangered Planet" and Margaret Sprout's "Towards a Politics of the

Framework for Analysis", 1998; Renner, Michael. "Environmental Security: The Policy Agenda." *Conflict, Security & Development* 4, no. 3 (2004): 313–34.

⁶³Diana Ojeda, Jade S. Sasser, and Elizabeth Lunstrum, "Malthus's Specter and the Anthropocene," *Gender, Place & Amp; Culture* 27, no. 3 (2019): pp. 316-332.

⁶⁴ Peter Hough, "Back to the Future: Environmental Security in Nineteenth Century Global Politics," *Global Security: Health, Science and Policy* 4, no. 1 (2019): 1–13.

⁶⁵ Wolfram Kaiser, Jan-Henrik Meyer, and Michael W. Manulak, "Developing World Environmental Cooperation the Founex Seminar and the Stockholm Conference," in *International Organizations and Environmental Protection: Conservation and Globalization in the Twentieth Century* (Berghahn Books, 2017).

Planet Earth"⁶⁶. The importance of common security was highlighted by emphasizing how environmental problems will create problems in the international and national areas⁶⁷. In the ongoing process, the debates that environmental problems should be expanded in the direction of national security understanding have become evident. In particular, Redefining National Security discussed the expansion of national security by considering new threats which arise from human-nature connections that can create problems in the future⁶⁸. Although these early studies have focused on protecting the state and its interest in traditional ways, focusing on environmental problems has enriched and laid the groundwork for widening the scope of security.

This relationship between environment and security needs to be interpreted in widener and deeper conceptualization. During the Cold War era and after, big steps to achieve political goals on environmental issues have been made. Especially, the focus on the environment and security connection became prominent in the international area as well with recent problems and increasing the impact of existing problems began to change the understanding and create new approaches. Although the United Nations often focused on promoting peace and security in its global agenda, the UN Summit on Environment in 1972 underlined the environmental issues and common solutions for the first time. However, the summit's theme was to create a consensus on environmental problems. Still, the developed countries, which have caused massive environmental degradation since the industrial revolution, requested to provide additional efforts and financial support from developing countries. Also, the developing countries were prone to regard environmental problems as a luxury⁶⁹.

⁶⁶ Peter Hough, "Rethinking Security in the Twenty-First Century" (2017): 0–15.

⁶⁷ Ibid. p.2

⁶⁸ Kurt M. Campbell and Christine Parthemore, "National Security and Climate Change in Perspective," in *Climatic Cataclysm: The Foreign Policy and National Security Implications of Climate Change* (Washington, DC: Brookings Institution Press, 2008), pp. 1-25.

⁶⁹Barry, Buzan; Wæver, Ole & de Wilde, Jaap. "SECURITY A New Framework for Analysis", 1998. p.74

Therefore, global environmental threats, such as the Chernobyl incident in 1986 and ozone depletion, have gained importance. Moreover, Brundtland Report's Our Common Future⁷⁰ article stressed environmental "security." The discussions on creating a connection between security and the environment have also developed since the Brundtland Report. The environmental issues became a critical area in the middle of non-military debates on security. Following years, The United Nations Security Council's 1992 declaration acknowledged that peace and security had been threatened by non-military sources such as economic, social, humanitarian, and environmental areas⁷¹. The paper also stressed the ideas of multinational action and mechanisms for environmental security threats. In that regard, environmental security has been formally addressed for the first time in an international area. Additionally, it has been stated that environmental security is closely related to areas such as food security and human security with the publication of the 1994 UN Human Development Report⁷². The rapid increase in temperatures, food shortages, and nature destruction has brought the threat of environmental security problems to emphasize and has led to the problem being addressed on a global scale. In this direction, global environmental problems have highlighted the importance of national and international cooperation.

In addition, security is associated with food, health, and environment, and it can also affect national and global levels⁷³. In many respects, food security has become a part of the political discourse with dynamics such as agriculture, climate, and political

⁷⁰ Brian R. Keeble, "The Brundtland Report: 'Our Common Future," *Medicine and War* 4, no. 1 (1987): 17–25.

⁷¹ UNSC, "The Responsibility of the Security Council in the Maintenance of International Peace and Security," 1992, 813–22.

⁷² I. Orlova, Y. Streltsova, and E. Skvortsova, "The UN 1994 Human Development Report Presents Concrete Proposals for the Social Summit," *Refuge: Canada's Journal on Refugees* 14, no. 2 (1994): 18–20.

⁷³ Cameron Holley et al., "Environmental Security and the Anthropocene: Law, Criminology, and International Relations," *Annual Review of Law and Social Science* 14, no. July (2018): 185–203.

economy by bringing attention to security threats to food. For example, Brinkman and Hendrix underline that in a situation where there is food insecurity, it can cause violence and be a source of unrest and conflicts that will continue to increase in the current political system⁷⁴. Furthermore, it can lead to violent conflicts, protests, and lay-offs in the system and affect people who cannot reach enough food. People who cannot reach enough food can be insufficient in terms of workforce, posing a threat to production and social stability, causing disruptions and pauses. For instance, pauses in the agricultural sector and food system can also affect incomes and the population earning their living from this sector. Eventually, national policies internalize food security as a policy issue and a priority issue in security matters. For this reason, food security is a crucial topic of national policies, strategies, and programs. The following section will cover the definition of this concept, its evolution, and fundamental discussions.

2.4. Food Security

Food security is a prominent issue in International Relations due to its multidimensional nature and perception at international, national/regional, and household/individual levels⁷⁵. Food security and insecurity are at the core of all those food-related issues and crises. It has been at the center of academic, political, and environmental debates long enough. For this reason, when it comes to food security, it turns out that too many definitions are made, and there might be confusion of meaning. There are discussions on the concept of food security, especially when this concept is used together with some definitions or used instead of some definitions.

⁷⁴ Henk-jan Brinkman and Cullen S Hendrix, "Food Insecurity and Violent Conflict : Causes, Consequences, and Addressing the Challenges," *Challenges*, no. July (2011): 1–28

⁷⁵ Adelphi Series, "Chapter One: Understanding Food Security," 53, no. 441–442 (2013): 23–48
From a technical perspective, food security is classified into connected four pillars or dimensions. Those are food availability, food access, food utilization, and food stability⁷⁶. Those pillars present a broader picture for food security understanding and its meaning. They introduce the coverage zone of food security in many topics and how to measure this concept, yet it will be highlighted in the next chapter in detail. Moreover, one of the most well-known definitions is that of the Rome Declaration adopted at the 1996 World Food Summit, stressing that food security "exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."⁷⁷ At this point, it is helpful to emphasize the concept of food insecurity, which is sometimes used interchangeably with food security⁷⁸. According to Restuccia et al., food insecurity occurs when there is no food in an available way or there is a deprivation of entitlement to nutrient and food ⁷⁹. They classify two forms: "transitory food insecurity", which happens in sudden changes such as droughts and famines leading to long-term crises, and "chronic food insecurity" is rooted in long-term situations such as hunger, and people are under serious threat of those crises.

In addition to being the most basic need of people throughout history, food has also been a problem that worries humanity the most. Rising concerns have led to an increase in food security studies and create "plethora of definitions."⁸⁰ Studies that have gained momentum since the 1970s have been expressed with thirty different definitions until

⁷⁶ FAO, "Declaration of the World Summit on Food Security". (Rome: FAO, 2009).

⁷⁷ FAO, "*Rome Declaration on World Food Security and World Food Summit Plan of Action*". (1996). Available online at: <u>http://www.fao.org/DOCREP/003/W3613E/W3613E00.HTM</u> (accessed on January 08, 2022)

⁷⁸ Peter Warr, "Food Insecurity and Its Determinants," *Australian Journal of Agricultural and Resource Economics* 58, no. 4 (2014): 519–37.

⁷⁹ Donatella Restuccia et al., "Food Security: A Global Problem," *Advances in Food Science and Technology*, (2013), 19–102.

⁸⁰Benjamin Shepherd, "Thinking Critically about Food Security," *Security Dialogue* 43, no. 3 (2012): 195–212.

1990⁸¹. For instance, food security was defined as a "condition where every human would meet enough food properly and afford sufficient food regular way"⁸²: as "achieving access and afford to nutritious food sources to abstain from hunger"⁸³: as "the availability of basic food to meet world food consumption while stabilizing prices and adequate food"⁸⁴: as "meeting the basic food needs in all year" by UNICEF⁸⁵. According to Maxwell and Smith's view, there were more than 180 bibliographic items on the issues of concepts and definitions of food security between 1986 and 1991⁸⁶. They stressed this complication by explaining the differences and changes in the level of analysis. In the late 1980s, the main point was to focus on individual and household levels while emphasizing how food security creates vulnerability and why an individual's food entitlement needs to be secure to access food. It stressed that the perception of security will not only consist of the military field and that states and politicians have begun to change their political agendas with environmental security problems that manifest themselves in every field⁸⁷. As mentioned in the above section, after the end of the Cold War and the concept of security has widened, food has also been shaped by policymakers as trying to create a perception of security due to increasing concerns and problems. In fact, according to Griver, policies are shaped by

⁸¹ Renata, Grochowska. Specificity of Food Security Concept as a Wicked Problem. *Journal of Agricultural Science and Technology B*. 4. (2014). 823-831.

⁸² Tim Lang and John Ingram, "Food Security Twists and Turns," Addressing Tipping Points for a Precarious Future, 2013, pp. 81-103.

⁸³ Donatella Restuccia et al., "Food Security: A Global Problem," *Advances in Food Science and Technology*, (2013), 19–102.

⁸⁴ United Nations, "Report of the World Food Conferance Rome, 5-16 November 1974," *United Nations Publication*, no. November (1975): 2–70.

⁸⁵ Simon Maxwell, "The Evolution of Thinking about Food Security," *Food Security in Sub-Saharan Africa*, 2001, 13–31.

⁸⁶ Maxwell, Simon and Smith, Marisol. "Household Food Security: A Conceptual Review," 1992

⁸⁷ Shoshanna Griver and Itay Fischhendler, "The Social Construction of Food Security: The Israeli Case," *Food Security* 13, no. 5 (2021): 1303–21

framing food as a national security issue⁸⁸. Moreover, food security has a comprehensive space of its definitions and explanations, creating lots of room for debates and consequences in areas of economy and politics⁸⁹. Thus, the concept continues to exist as one of the critical issues in the focus point of policymaking through defining their debates and consequences while addressing those subjects at the level of analysis. As stated by Sassi, food security can be analyzed at levels; international, national/regional, or household/individual⁹⁰, and there is no superiority between each other. It is because all levels differ from each other such as a sustainable food supply chain, stability in food prices is considered at international levels. However, it changes as balancing food supply and demand at the national level and accessibility of sufficient and nutritious food at the household level⁹¹. It is crucial to understand the measurement of food security at each level. Nevertheless, these levels impact the conception and meaning of food security.

Food security has evolved, and its meaning has diversified. The roots might be addressed in the Universal Declaration of Human Rights in 1948 as stressing everyone has the "right to food" to sustain life⁹². It was mentioned that food was a basic human need, but there was no mention of its quality or even how secure those foods were. Previously, food security was interpreted as the total amount of food available in a country, in other words, food availability. For this reason, it was seen as the responsibility of the states for each country to produce enough food to secure its food. The aim was to prevent starvation by ensuring that the population within the borders was fed adequately. As food security becomes more focused, it has become clear that

⁸⁸ Ibid. p. 1304

⁸⁹ Renata, Grochowska. "Specificity of Food Security Concept as a Wicked Problem". *Journal of Agricultural Science and Technology B.* 4. (2014). p. 826

⁹⁰ Maria Sassi, "Food Security Basics," Understanding Food Insecurity, (2018), 1-30

⁹¹ Ibid. p.10

⁹² United Nations, "United Nations Universal Declaration of Human Rights," *Applied Ethics:* A *Multicultural Approach: Sixth Edition*, (1948), 54–57.

there are different situations beyond just the availability of food⁹³. This creates some shift in the conceptualizing of food security and its methodology. The most famous approach is formulated by Simon Maxwell⁹⁴. He categorizes the evolution of food security into three categories. These categories put forth inherent characteristics of food security in policymaking. From his point of view, food security has been conceptualized as closely related to three major paradigm shifts since the World Food Conference in 1974. The three shifts underline how the level of analysis, perspectives, and food security policies changed starting from 1975 to 1990 and after. The first shift is from the global and national level to household and individual level from 1975 to 1985; the second shift is that changes in food first perspective to a livelihood until 1990 and after; the last one is that change in perspective from objective to subjective after the 1980s⁹⁵.

In the 1970s, references were made to the quality of food, the basic nutritional values, and the calories that should be taken daily. According to Joy's ideas, if a plan is to be made for food and nutrient, it should be started by determining those who cannot reach enough food and measuring nutrients for them⁹⁶. He discussed that there are gaps among people regarding food supply and nutrition. On the other side, Amartya Sen argued that some people do not have access to adequate food, which is an "entitlement to food." He argues that this does not occur only in any region or country with difficulties in accessing adequate food⁹⁷. The basic understanding is that food can be

⁹³Shannon O'Lear, "Food Security" in *Environmental Politics: Scale and Power* (Cambridge, UK: Cambridge University Press, 2010).

⁹⁴Simon Maxwell, "Food Security: A Post-Modern Perspective," *Food Policy* 21, no. 2 (1996): 155–70.

⁹⁵ Simon Maxwell, "The Evolution of Thinking about Food Security," *Food Security in Sub-Saharan Africa*, 2001, 13–31

⁹⁶ Leonard Joy, "Food and Nutrition Planning," *Journal of Agricultural Economics* 24, no. 1 (1973): p. 165

⁹⁷ Amartya Sen, "The Food Problem: Theory and Policy," *Third World Quarterly* 4, no. 3 (1982): 447–59.

accessible in any country or region but not for every person. This human-centric approach stresses putting food access into the center while criticizing the general acceptance of the quantity and availability of food back then. According to Sen, the core understanding of poverty and famine is no access to food⁹⁸. Moreover, Sen created a connection between poverty, starvation, and famine in this period⁹⁹. He stressed that starvation is a situation where people experience insufficient food for a living, but in terms of famine status, people face death that derives from insufficient food¹⁰⁰. This approach draws attention because of putting the individual at the center of this shift. In the definition of the World Bank, each person's access to adequate food becomes prominent¹⁰¹. The importance of a healthy and active life is underlined by the fact that people have access to food security is shaped in the international area with this emphasis.

The period of 1985 - 1990 and forwards is the second paradigm shift. The primary key is understanding the link between food security, poverty, and famine. In this shift, food security for households is emphasized. Thus, any country has to guarantee to prevent food-related crises and secure current and future livelihoods and food¹⁰². In the findings of FAO, food-related jobs are the primary areas for people in low-income and developing countries¹⁰³. These job areas provide their income and expenditures. It is also important that most of the household expenditures on food products can be more

⁹⁸ Devereux, S. "Sen's Entitlement Aprroach: Critiquesnd Counter-Critiques." *Oxford Development Studies* 29, no. 3 (2001): 245–63.

⁹⁹ Ibid. p. 246-47

¹⁰⁰ Ibid. p. 251

¹⁰¹ World Bank, "Poverty and Hunger: Issues and Options for Food Security", 1986.

¹⁰² Maxwell, Simon and Smith, Marisol. "Household Food Security: A Conceptual Review," 1992: 1-72

¹⁰³FAO, "The State of Food Security and Nutrition in the World 2021," (Rome:FAO, 2021)

than 70%. Therefore, any food-related problems can directly affect households. In this sense, sustainability becomes the key to preserving the livelihood of households and securing food¹⁰⁴. The main argument is to make a distinction between the food first approach and the "sustainable" livelihood approach for food security at the household level. Thus, the food first approach objective is about accessing and producing more food so it can create maximum levels of consumption and production, but the second approach has adopted a production strategy that maintains both protect the current livelihood of people and future generations' food. This approach consequently underlines how food security draws attention to livelihood security at the household level. It creates a perspective on the household as an important unit for ensuring sustainability and efficiency in the long term¹⁰⁵.

The last paradigm shift covers how the attitude of food security indicators and measurements has changed from objective to subjective ¹⁰⁶. This shift from level and quantity of consumption and daily calorie and protein intake has changed to more comprehensive and subjective measurements such as quality of food, livelihood security, local products, and more. This shows that the quantity and availability of food are as important as the quality and entitlement of food. It opens space in the formulation of the food security concept by adding both subjective and objective indicators and measurements. The calculation for calorie intake per day is not an ideal form for considering. Moreover, many factors such as environment, health status, and political economy are effective, and calorie calculation in general terms and which proper guidelines need to consider for people. It creates difficulties in

¹⁰⁴ Maxwell, Simon and Smith, Marisol. "Household Food Security: A Conceptual Review," 1992: 1-72

¹⁰⁵ Ibid.

¹⁰⁶ Simon Maxwell, "Food Security: A Post-Modern Perspective," *Food Policy* 21, no. 2 (1996): 155–70.
¹⁰⁷ Ibid. p. 159

^{101d.} p. 159

calculating the correct daily calorie intake for societies in different groups in a country. Although the transformations in the discussion started to change after the 1980s on food security, this is not the only condition for ensuring food security. The transformation from objective to subjective indicators and measurements has been multi-dimensional. Additionally, the new era emerged in the 1990s, and globalization started to be effective quickly¹⁰⁸. This new era has begun to take shape with the formation of multinational structures, cooperation, and regulations in the global area. After the GATT (General Agreement on Trade and Tariffs), which was one of the steps taken for the formation of economic relations that emerged in the 1980s, the World Trade Organization (WTO) was established in 1996, and important steps were taken in international cooperation for food security, subsidies and the free movement of agricultural products and other goods between countries¹⁰⁹. Likewise, the search for solutions in the global area became prominent by holding summits between states for the solutions to problems such as food security, poverty, and hunger. Moreover, the third paradigm shift's top point for the meaning of food security was the 1996 World Food Summit¹¹⁰. It was the major key moment for consideration of food security at the global level. FAO (2006) has emphasized the multidimensional inherent of food security¹¹¹. FAO analyzed the link between the socio-economic and political environment of food security and insecurity that has emerged from hunger and poverty. Additionally, the first and second paradigm shifts show how a level of analysis has been made for understanding food security. However, the third one only shows the change in the measurements and indicators of food security analysis. It can be said that despite changing world politics and concerns over environmental security,

¹⁰⁸Jessica Duncan, "The Evolution of Global Food Security Policy," *Global Food Security Governance*, 2018, 42–83.

¹⁰⁹ Friel, Sharon and Ford, Laura . "Systems, Food Security and Human Health," *Food Security* 7, no. 2 (2015): 437–51.

¹¹⁰Jessica Duncan, "The Evolution of Global Food Security Policy," *Global Food Security Governance*, 2018, p.60

¹¹¹ FAO, "The State of Food and Agriculture 2006," 2006.

the third paradigm shift has less evidence to mention the global level of food security, but only indicators shift from objective to subjective¹¹². This needs to be clear that the first two paradigm shift is about how the perception of food security changes from the national or global level to the individual and household level and also livelihood security at the household level. These first two paradigm shift focuses on the level of analysis of food security. On the contrary, the third paradigm shift mainly draws attention to how the indicators and measurements of food security have been changing over time. Yet, there might be expectations that the third one can have a sense at the international level, but with different indicators. The change in the understanding of food security clearly shows that multidimensional issues and indicators are also important. Therefore, the expectation from the third paradigm shift would highlight states' position on preparing national policies and strategies to deal with multidimensional problems of food security in the international area and how they cooperate with each other to secure food, reduce poverty, use of land and soil, trade fairly, and more.

From another perspective, Mooney and Hunt (2009) present a distinct concept of historical shifts and timelines on food security and policy: "frames and keying¹¹³." They argue Maxwell's analysis is evolutionary, but it demonstrates the fact that each shift is on individualization. Mooney and Hunt create more "collective and consensus frames." Their attempt is to strengthen food security as more collective action frames. However, in their work, they show the importance of the keying method to give a dynamic meaning within the frames¹¹⁴. They try to illustrate food security by splitting it into three different frames with two keyings: sharp and flat key. Keying focuses on

¹¹² Jessica Duncan, "The Evolution of Global Food Security Policy," *Global Food Security Governance*, 2018, 42–83.

¹¹³ Patrick H. Mooney and Scott A. Hunt, "Food Security: The Elaboration of Contested Claims to a Consensus Frame," *Rural Sociology* 74, no. 4 (2009): 469–97.

¹¹⁴ Renata, Grochowska. "Specificity of Food Security Concept as a Wicked Problem". *Journal of Agricultural Science and Technology B.* 4. (2014). 823-831.

different perspectives on every one of these frames. "Sharp keying" is a more critical one as focusing on the alternate situation of food security and its objectives such as environment and trade, but "flat keying" is a more smooth and dominant type of food security associated with food production and availability in the balance of supply and demand. According to their work, the first framing deals with food security by explaining it through the problem of "hunger."¹¹⁵ The hunger frame refers to the impact and outcome of the food security issue on the individual with "flat key." Likewise, globalization and developing technologies are associated with hunger and food security, and it focuses on the individualization of changing trends. On the other hand, "sharp key" emphasizes the understanding of food security from new perspectives, such as the effects of food insecurity or food sovereignty. It offers a critical perspective on how the subject has evolved and expanded with new perspectives¹¹⁶. The sharp key criticizes the flat key's individualization trend of hunger. In the sense of hunger, there remains collective action and regional level focus. Contrary to the flat key, the sharp key's intentions bring more about local and regional food security. Sharp key also criticizes the potential global markets' interaction with local food production and resources because they might intervene much. Secondly, the "community" has been introduced as a frame. In this framework, the sharp key underlines the fact that food access and availability are at the community level¹¹⁷. Especially with the protection and continuity of food resources and the formation of an equal community, food security emerges as a concept beyond just ending hunger. It offers that connection with the environmental and socio-political areas create more understanding of community food security. However, the flat key focuses on the coordinated and integrated processes of community-level policies and programs on

¹¹⁵Patrick H. Mooney and Scott A. Hunt, "Food Security: The Elaboration of Contested Claims to a Consensus Frame," *Rural Sociology* 74, no. 4 (2009): 469–97.

¹¹⁶ Jessica Duncan, "The Evolution of Global Food Security Policy," *Global Food Security Governance*, 2018, 42–83.

¹¹⁷Patrick H. Mooney and Scott A. Hunt, "Food Security: The Elaboration of Contested Claims to a Consensus Frame," *Rural Sociology* 74, no. 4 (2009): 469–97.

food security. Finally, the last one is the "risk" framework. The flat key refers to the dangers that emerging technology can pose in food-related fields. In this respect, it is mentioned about the safety of food and the risks that may occur in the production and processing stages. For example, the use of chemicals and preservatives to ensure the longevity of food products or to repel insects poses a danger to food safety. On the other hand, the sharp key takes a distinct perspective, emphasizing the food security problem that terrorist attacks can pose on agricultural fields, natural resources, or food systems. To sum, Mooney and Hunt's ideas indicate that keying supports the idea of functioning as a bridge of the borders between frames, not borders within frames¹¹⁸. This concept tries to light on several indicators in one frame because of the multidimensional nature of food security.

Additionally, in conceptualizing food security, academics have intensified their ideas and views on divergent frames of food security as the concept keeps evolving and shaped by a variety of events¹¹⁹. As mentioned above, making categories and framing the ideas on food security facilitate the complexity of the concept. Besides academics, the national governments, NGOs, intergovernmental organizations, and international organizations have also dramatically shaped queries on food security and food policies. The notion as spread out by the UN itself and agencies like FAO, World Bank, IPCC, Greenpeace, and even NASA keep underlining the importance of food security at the global level¹²⁰. Especially with the 2007-2008 food crisis, the importance of food security in the global area has been further understood. However, there was a mismatch between the lifestyle of consumers and food systems. The idea was to produce agricultural goods more and more to match the increasing population and demand-

¹¹⁸ Ibid.

¹¹⁹ Samantha Noll and Esme G. Murdock, "Whose Justice Is It Anyway? Mitigating the Tensions Between Food Security and Food Sovereignty," *Journal of Agricultural and Environmental Ethics* 33, no. 1 (2020): 1–14.

¹²⁰ Hans Page, "Global Governance and Food Security as Global Public Good," *New York University*, no. 8 (2013): 1–32

side, but food prices rose gradually in 2006 and then bombed between 2007-2008, and it created volatility in prices¹²¹. FAO (2008) mentions that states are insufficient in this crisis because their taking measures by introducing export restrictions and price controls will not be continuous, and it will create more negativities¹²². Like Qatar, some countries are dependent on imported food due to their limited agricultural areas¹²³. In that regard, the preventive export restrictions during this time have posed a danger to the countries' ongoing situation. As the first reaction of the states, they reevaluated their food security policies, and then they took unilateral preventive restrictions that caused a disadvantage to the stability and prices of food. FAO predicted that because of rising food prices, the number of people living on the poverty line would increase to 900 million in 2008¹²⁴. Nevertheless, it is pointed out that states benefit from this crisis and seize an opportunity for themselves to cooperate in the global area. For example, it stressed that states should create policies to ensure access to food instead of taking new export measures by turning this crisis into an opportunity. Policies should be prioritized on issues such as making the agricultural lands in the country productive and increasing food production by helping the agricultural sector with seeds. In this way, preventive policies such as restricting export activities in food products can be avoided. In the long term, with the strengthening policies in agriculture, commercial activities can be conducted for the countries experiencing a food crisis, and an opportunity can arise for a solution to the food crisis and food security¹²⁵. Likewise, increasing food prices can lead developing countries to focus on their agricultural production and develop policies for food security problems. In this way, it may lower the food prices in the world, and the food supply may be responded

¹²¹ Tim Lang and John Ingram, "Food Security Twists and Turns," Addressing Tipping Points for a Precarious Future, 2013, pp. 81-103.

¹²² FAO, "The State of Food Insecurity in the World 2008", (Rome: FAO, 2008)

¹²³ Justa Hopma and Michael Woods, "Political Geographies of 'food Security' and 'Food Sovereignty," *Geography Compass* 8, no. 11 (2014): 773–84

¹²⁴ FAO, "The State of Food Insecurity in the World 2008", (Rome: FAO, 2008)

¹²⁵ Ibid.

to. In addition, in order not to repeat similar crises in the future, there is a need for both the harmonization of countries and the strengthening of their own food security policies. Furthermore, the food crisis adds other layers, such as the importance of investment and research in agriculture and water, price speculation of food, and such to the already complex problem of food security and making it even more complex 126 . This complexity highlights why food security is important at a national level and needs a prominent level of harmonization in the international area. Consequently, the perspective on the solution of food security has been shaped in the international arena with the meetings where problems such as the increase in food prices, the trade restrictions taken by the states, and the rising in hunger are discussed. Cooperation and financing promises were made at the summits where actors met on the issue of ensuring global food security, but the process continued with inconsistent policies and promises that were not kept. For instance, the FAO calls for improvement in food production and reduction of poverty and hunger, but G8 focuses on trade and market liberalization of food and goods ¹²⁷. However, there are also other countries that have already been suffering food-related issues. It should be considered that this shows the differences in food security understanding among the actors clearly. Still, the differences and creating room for discussions on food security at the international level are indispensable parts of future debates and considerations of new assumptions. Even though actors had a challenging time keeping their promises, these summits created a way to enhance the meaning of food security in the international arena and address the problems and consequences of food security policy in the future¹²⁸. Nevertheless, it should be discussed whether this creates a new process because states still cause decisions to be made in their own interests and actors to make decisions. For this

¹²⁶ Jessica Duncan, "The Evolution of Global Food Security Policy," *Global Food Security Governance*, 2018, 42–83."

¹²⁷ Anuradha Mittal, "The 2008 Food Price Crisis," *Intergovernmental Group of Twenty-Four*, no. 56 (2009).

¹²⁸ Pedro Sousa, "What did we learn from the bout of high and volatile food commodity prices (2007-2013)?," (Rome: FAO, 2017).

reason, although its success in framing an international food security problem is mentioned, national interests have continued to be protected, and an international decision mechanism has not been established yet. The lack of an international mechanism to ensure food security has pushed the problem to be addressed at the national security level or at the individual level. However, increasingly complex global food-related problems and various assumptions draw attention to the provision of food security primarily at national levels.

2.5. New Challenges of Food Security

The literature on the causes of food security has been shaped by different analyses, and scholars put various categorizations on these new challenges¹²⁹. For Lang, fundamental challenges are stated under three factors. It is identified with three major factors: economic factors resulting from high food prices, quotas and tariffs on trade, nutritious foods in the supply chain; environmental factors resulting from the climate crisis, water, and soil degradation, loss of biodiversity, food waste, and loss; social factors resulting from poverty, gender and inequalities, governance issues, population stress¹³⁰. There now needs to address in a broad scope of those problems that affect the above three factors at the global level. However, these factors can change in various situations and times in terms of intensity and level of effectiveness due to food security's multidimensional and complex nature. For instance, when the lack of food and water and malnutrition of children or adults can take part in the developing and

¹²⁹ Jennifer Coates, "Build It Back Better: Deconstructing Food Security for Improved Measurement and Action," *Global Food Security* 2, no. 3 (2013): 188–94; Nora McKeon, "Food Governance: A Rapid Historical Review," in *Food Security Governance: Empowering Communities, Regulating Corporations*, ed. Nora McKeon (Taylor & Francis, 2015), pp. 11-30.

¹³⁰ Tim Lang and John Ingram, "Food Security Twists and Turns," Addressing Tipping Points for a Precarious Future, 2013, pp. 81-103.

low-income countries' agendas, overweight and obesity of children or adults and organic diets can take part in the developed country's agenda intensely. Similarly, food security is overseen from different perspectives in developed countries due to the high level of access to food. Issues such as the quality of food, the availability of organic products, and the waste of food become important topics. On the other hand, for developing and low-income countries, a unique perspective is at the center: accessing adequate food and even avoiding hunger. FAO's indications show that the African population suffers from hunger. On the Continent, the hungry population has been rising and has become 250 million since 2014¹³¹. According to 2020 data, one out of every three people cannot reach enough food, and this number has been reaching 2.37 billion. Likewise, "The World State of Food Security and Nutrition" estimates that in 2020 between 720 and 811 million people will face hunger with the impact of COVID-19, which emerged as a global pandemic in 2019¹³². While the effects of COVID-19 continue, it also causes the intensification of crises in many areas of food security. It is a crucial point that it threatens the food systems, which are fundamental for income, livelihoods, and employment of especially developing and low-income countries. For this reason, it is possible to say that people who take part in the food system are more affected. In particular, the closure of the borders due to health concerns and the slowdown in the economy paved the way for the emergence of food security at the national and global levels. Similarly, the gender gap and women's participation in the food systems has also led to a gradual decrease. FAO emphasized food insecurity and stated that the gender gap between men and women would increase by 10 percent in 2020^{133} . For this reason, it is emphasized that policymakers should be more effective in the field of women's participation and gender equality in food systems, considering the effects of COVID-19. In addition, "the 2020 Sustainable Development Goals Report" draws attention to the necessity of strengthening every stage in the food

¹³¹ FAO, "2019 Africa Regional Overview of Food Security and Nutrition" (Ghana: FAO, 2020)

¹³² FAO, "The State of Food Security and Nutrition in the World 2021." (Rome: FAO, 2021)
¹³³ Ibid.

system and increasing agricultural products in countries that already have fragile food systems and are fragile to various effects¹³⁴. Additionally, the report indicates that the intensity and frequency of extreme weather and effects of the climate crisis have been increasing and that they are felt even more due to the COVID-19 pandemic. Climatic conditions, which are currently a security problem due to drought and floods, continue to affect many stages of the food system. Moreover, the increase in extreme climatic conditions and outcomes of environmental degradation shows that food security has taken a major place and that the COVID-19 pandemic conditions have left this situation more vulnerable. Due to these effects, which continue to intensify on food systems, it is predicted that in 2020, more than 132 million people will be undernourished or unable to reach enough food. Although the devastating effects of the pandemic have decreased compared to the previous year, they are still palpable¹³⁵.

Grote argues that the new challenges and complex structures that cause food security, and insecurity at some points, have spread into three categories: the supply side, the demand side, and the market side¹³⁶. The scholar underlines that food security is a socio-economic problem, but market-related problems occur as well. In the supply-side causes, land and water are fundamental to food production. It should be stated that the availability of arable land or soil, the presence of water, and a rich ecosystem are highly important. However, converting arable lands has zoned with rising urbanization and has led the presence of arable land to reduce by 10 - 20%¹³⁷. She also mentioned that after the 2008 food crisis, developing countries began to sell their own arable land for food production. Especially the USA, the UK, and China have accelerated their intentions to purchase and manage other arable lands. In terms of water, the differences

¹³⁴ UN, "The Sustainable Development Goals Report," 2020, 1–68.

¹³⁵ Sabine O'Hara and Etienne C. Toussaint, "Food Access in Crisis: Food Security and COVID-19," *Ecological Economics* 180, no. June 2020 (2021).

¹³⁶ Ulrike Grote, "Can We Improve Global Food Security? A Socio-Economic and Political Perspective," *Food Security* 6, no. 2 (2014): 187–200

¹³⁷ Ibid. p.191

in the locations and precipitation of the countries affect the availability of water. Many countries in South Asia and East Asia have been suffering from water scarcity¹³⁸. Climate change and natural disasters are other causes on the supply side. Extreme weather, droughts, and floods are all connected with each other, and the climate crisis has been intensifying their effects and outcomes. These outcomes' impacts can be more negative, and especially in Africa effects of the climate crisis could be more severe as FAO stresses¹³⁹. For example, several sub-Saharan African countries have lost "20-60%" of their livestock due to drought since the 1990s.

In the demand-side cause, the importance of population growth and urbanization, changing diets, and food quality are highlighted. According to UN (2019) data, it is predicted that the 7.7 billion world population will reach 8.5 billion in 2030 and 9.7 billion in 2050¹⁴⁰. This population growth brings a parallel increase in the rate of urbanization, so agricultural arable lands are gradually shrinking. However, it is seen that the author's views also refer to the differentiation of urbanization in food consumption and lifestyles. With urbanization, consumption is growing in every sense, from buying new clothes to consuming more meat and dairy, and consumption patterns can be changed with it. If looking at the meat consumption issue, it can be easily seen that it is closely related to the livestock sector that consumes grain products. According to Sansoucy, almost half of the world's grain is used in the livestock industry for feeding them¹⁴¹. For this reason, the expansion of the production areas of grain products is inevitable, but another problem becomes prominent: converting forest areas into agricultural land creates deforestation.

¹³⁸ Miina Porkka et al., "Causes and Trends of Water Scarcity in Food Production," *Environmental Research Letters* 11, no. 1 (2016): 15001

¹³⁹ FAO, "2019 Africa Regional Overview of Food Security and Nutrition" (Ghana: FAO, 2020)

¹⁴⁰ United Nations, "World Population Prospects 2019: Methodology of the United Nations population estimates and projections", (2019)

¹⁴¹R. Sansoucy et. al, "Keynote paper: The contribution of livestock to food security and sustainable development", 1995: 9-22

In market-related causes, the food marketing systems, volatility in food prices, and food waste and loss have come into prominence. According to Grote, these food marketing systems are primarily insufficient¹⁴². The emphasis is on populations in cities demanding more food, and higher-quality foods such as organic foods begin to be consumed with increased incomes. It is argued that this situation is that the consumers in the cities prefer high-quality foods and even pay special attention to every step of these products, from production to transportation. It is emphasized that this situation can create a disadvantage for local food producers in developing countries who want to open to global markets because local producers who want to sell their own products may need to try to comply with the desired quality standards. On the other side, while there are people in the world who face the danger of malnutrition and hunger, food waste and loss are also of significant importance. The fact that 931 million tons of food were wasted in the world in 2019¹⁴³. This number can be interpreted as wasting enough food for people in countries suffering from hunger and malnutrition. Grote, on the other hand, emphasizes that "30%" of agricultural land is used for nothing, given the food wasted¹⁴⁴. Furthermore, Vaqué argues that European food waste could feed "200 million people" around the world¹⁴⁵, and McCarthy et al. also underline that the US spends more than \$210 billion each year on wasted food in food systems¹⁴⁶. These levels vary for developed and developing countries. While the percentage of food waste in developing countries is

¹⁴² Ulrike Grote, "Can We Improve Global Food Security? A Socio-Economic and Political Perspective," *Food Security* 6, no. 2 (2014). p.195

¹⁴³ FAO, "Food Waste Index Report 2021", UNEP, 2021.

¹⁴⁴ Ulrike Grote, "Can We Improve Global Food Security? A Socio-Economic and Political Perspective," *Food Security* 6, no. 2 (2014). p.195

¹⁴⁵ Luis Vaqué, "Food Loss and Waste in the European Union: A New Challenge for the Food Law?," *European Food and Feed Law Review* 2015, no. 1 (2015): 20–33.

¹⁴⁶ Ultan Mc Carthy et al., "Global Food Security – Issues, Challenges and Technological Solutions," *Trends in Food Science and Technology* 77 (2018): 11–20.

less, it comes to an average of 40 percent in developed countries¹⁴⁷. Another reason is the irregularity and volatility in food prices. The prices of basic food, which skyrocketed in 2007-2008, shook many countries and millions of people in the world. The instability and volatility in basic food prices result in chronic malnutrition and hunger, and it has been estimated that there will be one billion people suffering from malnutrition in 2009¹⁴⁸. The data of FAO, on the other hand, stated that the economic and commercial recession experienced five times the increase in the number of malnourished people in the last 20 years and that almost all low- and middle-income countries were affected ¹⁴⁹. In addition, food prices are affected by both demand and supply-side causes such as climate change and the destruction of arable lands. Thus, both sides affect the volatility of food prices and the food market.

Additionally, new challenges and problems in the food system create different alternatives in the literature on understanding of food security¹⁵⁰. There are movements that influence the food security such as food sovereignty and food justice. Firstly, the food sovereignty movement tries to address hunger and food security policy by criticizing market-related strategies, industrial production of food, and global efforts to secure food policy¹⁵¹. Although it appeared in the mid-1990s with the occurrence of La Via Campesina, there is still growing attention on this movement in various parts of the world. According to McKeon, this movement emerged as a counter-idea to criticize the neoliberal framework because food security, during the 1980s, was trying

¹⁴⁷ Ulrike Grote, "Can We Improve Global Food Security? A Socio-Economic and Political Perspective," *Food Security* 6, no. 2 (2014). p.195

¹⁴⁸ FAO, "The State of Food Insecurity in the World 2009", (Rome: FAO, 2009)

¹⁴⁹ FAO, "The State of Food Security and Nutrition in the World 2021." (Rome: FAO, 2021)

¹⁵⁰ H Wittman, "Food Sovereignty: A New Rights Framework for Food and Nature?," *Environment and Society* 2, no. 1 (2012): 87–105; See also: Megan Blake, "Landscape and the Politics of Food Justice," *Routledge Handbook of Landscape and Food*, 2019, 487–99

¹⁵¹ Samantha Noll and Esme G. Murdock, "Whose Justice Is It Anyway? Mitigating the Tensions Between Food Security and Food Sovereignty," *Journal of Agricultural and Environmental Ethics* 33, no. 1 (2020): 1–14.

to frame neoliberal ideas such as accelerating food production and increasing economic relations on global food trade and market¹⁵². However, food sovereignty argues that there needs to be more support for local food production and exporters. It focuses more on people who produce and consume the food, especially at the local and regional levels, rather than the global market and corporation forces' demands¹⁵³. It is about giving the power back to people who work to produce food where they live¹⁵⁴. In particular, it emphasizes that development, sustainability, and self-sufficiency at the local and regional levels are actually important steps towards ensuring food security in the country. It focuses on the local producer of the country as a power that can compete primarily in local markets. In this way, it draws attention to the presence of its own local producers who know their own soil, water, and other resources and to the formation of a structure that develops itself by producing in the domestic market of the country. It criticizes inadequate food policies in the food system by revealing the situation of local producers in both the north and south and the unfair structure of food systems. An example of this unfair structure is the position of women in the food system. FAO's data shows that women are more likely to lose their jobs or face greater care burdens due to food-based problems¹⁵⁵. Especially in the African and Asian regions, women's access to income is less than men's, but food expenditures in households are higher than men. Again, FAO emphasizes that women's contribution to agricultural production worldwide is 50 percent, but they do not receive equal pay. At this point, food sovereignty advocates that women should be paid equal wages, their

¹⁵²Nora McKeon, "Food Governance: A Rapid Historical Review," in *Food Security Governance: Empowering Communities, Regulating Corporations*, ed. Nora McKeon (Taylor & Francis, 2015), pp. 11-30.

¹⁵³ Bernardo P de Carvalho, "Food Sovereignty, Food Security and Sustainable Development" 2, no. 347 (2016): 124–42.

¹⁵⁴ Megan Blake, "Landscape and the Politics of Food Justice," *Routledge Handbook of Landscape and Food*, 2019, 487–99

¹⁵⁵ FAO, "The State of Food Security and Nutrition in the World 2021." (Rome: FAO, 2021)

participation should be increased, and their place in food systems should become equal compared to men¹⁵⁶. In this way, this gap between men and women can be eliminated.

On the other hand, the food justice movement seeks to reach all consumers of food in every class and race. However, it emerges as the opposite of food sovereignty, which emphasizes food producers more. Food justice appears as a political movement to empower local communities and disadvantaged groups to access food equally¹⁵⁷. It seeks to address their oppressions and exploitation in every step of food systems, and it is a bottom-up approach like food sovereignty. Although it draws attention to more local, class, or race on food-related issues, it raises efforts at wider food inequalities too. It focuses on certain groups that suffer hunger and poverty and, thus, criticizes the injustice behaviors of political structures¹⁵⁸. The food justice movement also leads NGOs, local and certain groups to raise their voices in action. According to Holt-Giménez, both approaches put efforts into framing new challenges of food security, and their perspectives overlap remarkably¹⁵⁹. Both present structural changes and critiques of inequalities and deficiencies in the food system's social, political economy, and social areas. Furthermore, the food justice perspective stresses the need for enhancing the access of certain groups to healthy and adequate food and local food production in a more sustainable way, but for food sovereignty, the need is a structural change in local and global food systems to create better conditions equally in the first place. Food sovereignty is a more radical one, contrary to food injustice, that is more progressive. More importantly, there is not quite opposition between food security,

¹⁵⁶ Tricia Glazebrook, Samantha Noll, and Emmanuela Opoku, "Gender Matters: Climate Change, Gender Bias, and Women's Farming in the Global South and North," *Agriculture (Switzerland)* 10, no. 7 (2020): 1–25

¹⁵⁷ Megan Blake, "Landscape and the Politics of Food Justice." *Routledge Handbook of Landscape and Food*, (2019), 487–99

¹⁵⁸ Agatha Herman, Michael K. Goodman, and Colin Sage, "Six Questions for Food Justice," *Local Environment* 23, no. 11 (2018): 1075–89.

¹⁵⁹ Eric Holt-Giménez, "Food Security, Food Justice or Food Sovereignty," *Journal of Peasant Studies* 37, no. 2 (2010)

food sovereignty, food justice, and even the right to food. Hence, these approaches and movements have been sharing common points in their understanding.

2.6. Conclusion

This chapter emphasizes the role and importance of food and how it has become a security problem, considering the challenges that have developed throughout history. Food comes first for humankind to survive. For this reason, food has been one of the oldest matters in the history. It is inevitable that this food has become prominent in many areas such as security, politics, and the environment throughout history.

Moreover, the environmental and security issues in Security Studies, which is a subfield of the International Relations (IR) discipline, have been tried to be analyzed. The approach made here started with how the concept of security is handled. Emphasis only on the military area has changed over time. This chapter shows that the security problem was addressed from different perspectives as a result of the changing situations during and after the Cold War. Moreover, environmental security, which is seen as one of the low policy issues, is examined. The framing of food and food-related problems in the field of security becomes apparent in this chapter. Food security is also important in this respect because it is shaped by changing challenges, discourses, and frameworks. It shows that food security has a multidisciplinary, multidimensional, and complex structure.

Furthermore, different definitions and approaches to food security are mentioned. Along with historically changing conditions, different conceptual frameworks are examined, and these concepts shape food security. From the levels of analysis on the concept of food security, different perspectives become prominent by addressing the global, regional/national, and individual/household levels. Likewise, the effects of closely related but different concepts of food security and different approaches shape food security today. It discusses how several factors such as increasing environmental problems, climate crisis, destruction of natural resources, population and urbanization, pandemics such as COVID-19, gender inequality in food systems, food prices, etc., create a security threat to food problems. The various effects of these problems in the levels of analysis emphasize why food security is central issue.

CHAPTER 3

FOOD SECURITY AND FAO

3.1. Introduction

This chapter shows how The Food and Agriculture Organization of the United Nations (FAO) was established and what policies it followed over the years. Then, it includes the goals and policies that have been followed in the fields of agriculture and food since its establishment and indicates how it acted according to the conditions of the period and changing situations.

The next section examines the decision-making and management mechanisms that make up the organizational structure of FAO and outlines the functions of these structures. The main purpose is to show policy-making and decision-making processes. Moreover, FAO's policies and objectives are also examined, considering the dimensions of food security. This section covers the dimensions of food security in detail.

The following section highlights international cooperation and conflicts within FAO. It is emphasized what causes these conflicts and how solutions are followed. Especially the problems between developed countries that are major powers and donor countries and developing countries are discussed. The effects of other international organizations that have acted together with FAO over the years are also underlined in this section. It also highlights how FAO shapes its policies with some other international organizations for common purposes and goals. In particular, in the last section, the new challenges FAO faces and the steps it has taken for achieving the goals and purposes in the agricultural sector and food security will be mentioned.

3.2. The Historical Evolution of FAO

The Food and Agriculture Organization of the United Nations has roots back towards the end of World War II. The global-scale problems in agriculture and food systems have led to rising international concerns about food security¹⁶⁰. The post-war agenda has been shaped by concerns about food, agriculture, and nutrition. Moreover, there were severe food shortages due to the reduction of basic productive capacity and the destruction of transportation networks caused by the war. The quest for addressing these problems accelerated the creation of a higher international body. Thus, in the latest years of the Second World War, forty-four representatives of countries met between 18 May to 3 June 1943 to discuss the establishment of a new organization in the area of food and agriculture in Virginia with the initiatives of the President of the United States of America, Franklin D. Roosevelt¹⁶¹. After the meetings, an Interim Commission was established for the preparations for a permanent organization at the end of the war. The fundamental goal was to achieve getting rid of the lack of insufficient and limited food for the health and strength of all people. On 16 October 1945, the Interim Commission arranged the draft Constitution. In the first place, thirtyfour countries became members to bring the constitution entered into force, and other countries followed them until 1953¹⁶². At the end of the day, FAO has been established as a special UN agency to secure and resolve food-related problems on the international level¹⁶³. The establishment of the FAO shows the need for a joint response to global food issues. This response carried the idea of not experiencing food problems in the world. Hence, since its creation, the FAO has held the responsibility

¹⁶⁰ OECD/FAO, "International Regulatory Co-operation and International Organizations: The Case of the Food and Agriculture Organization of the United Nations (FAO)", 2016.

¹⁶¹ Ibid.

¹⁶² Ralph W Phillips.. "FAO: Its Origins, Formation and Evolution 1945-1981." 1981, pp.1-197.

¹⁶³Matthew Canfield, Molly D. Anderson, and Philip McMichael. "UN Food Systems Summit 2021: Dismantling Democracy and Resetting Corporate Control of Food Systems." *Frontiers in Sustainable Food Systems*, 2021

to collect information on the food and agriculture of nations, analyze outcomes, and spread them with the other nations to reach the food and nutrition needs globally. The FAO became a unique organization in terms of food-related issues because there were no other organizations or competitors. In the following years, many different organizations such as the World Bank and WHO went into action and showed their interest in food and agriculture¹⁶⁴. However, the FAO kept highlighting its goals, specifically to supply and secure enough food for everyone and to speed up agricultural production while securing the livelihoods of producers in a sustainable way¹⁶⁵. Securing livelihoods, postwar agricultural development, and rural welfare became one of the crucial efforts of FAO. Hence, enhancing the conditions of food systems and agriculture was a big step toward more healthy and adequate food and a better way of life. Especially, the focus had been made on countries that gained sovereignty and the war-destructed areas in terms of improving food and agricultural production¹⁶⁶. According to Sassi, the areas of focus were Asia, Africa, and Latin America. The destruction caused by the wars in the Asian region, the high population, and the fact that the agricultural sector is one of the main livelihoods of the region attracted the attention of FAO¹⁶⁷. Especially the inadequacy or lack of individual daily nutrition becomes prominent. On the other hand, Africa was suffering from hunger, but Latin America stood out as a net food exporter and met the food demands in the region with its wide range. The agricultural sector was a major source of livelihood in Latin America as in Asia, so it showed the necessity of development based on both agricultural production and industrial development.

¹⁶⁴ Ibid. pp.4-5

¹⁶⁵ Amalia Ribi Forclaz,. "From Reconstruction to Development: The Early Years of the Food and Agriculture Organization (FAO) and the Conceptualization of Rural Welfare, 1945-1955." *International History Review* 41, no. 2 (2019): 351–71

¹⁶⁶ Leif E. Christoffersen, et al. "FAO: The Challenge of Renewal". (Rome:FAO, 2007)

¹⁶⁷ Maria Sassi, "The History of Food Security: Approaches and Policies," *Understanding Food Insecurity*, 2017, pp. 89-120

In the late 1940s, national governments focused on making their policies around development and recovery after the war¹⁶⁸. FAO, on the other side, gave much more attention to rural development and needs in the long term, so it did lots of research and surveys to define and develop better conditions at both regional/national and global levels. However, it did not last long because of institutional changes and newly independent states. FAO evolved its vision in the early 1950s to use more short-term practical tools and quick responses. Thus, this shift covered the technical support that includes expertise and economic aid that enhances food production¹⁶⁹. Additionally, FAO increased its ties with UNDP and World Bank with agreements to make effective its technical and economic tools. These ties also enabled the involvement of FAO in the project and design with field experts and technical support. For example, the UN Secretariat established the "Expanded Program for Technical Assistance (EPTA) and UN Special Fund" to operate programs mostly in developing countries. Both EPTA and Special Fund allowed FAO to get an annual allowance regularly until 1955^{170} . During the 1950s, FAO had already had more than one hundred projects in many different parts of the world by including more than one thousand professionals in the fields. The data shows that a hundred centers had been built to train experts in both scientific and technical areas¹⁷¹. However, Forclaz discussed that those technical assistances did not make economic conditions and rural development immediately better¹⁷². Although agricultural production had increased globally, the differences

¹⁶⁸ Leif E. Christoffersen, et al. "FAO: The Challenge of Renewal". (Rome: FAO, 2007). p.79

¹⁶⁹ Amalia Ribi Forclaz,. "From Reconstruction to Development: The Early Years of the Food and Agriculture Organization (FAO) and the Conceptualization of Rural Welfare, 1945-1955." *International History Review* 41, no. 2 (2019): 351–71

¹⁷⁰ Alison Small and O'Broin Síle, 70 Years of FAO: 1945-2015 (Rome: FAO Office for Corporate Communication, 2015).

¹⁷¹ FAO, "FAO: Challenges and Opportunities in a Global World", (Rome:FAO, 2019). p.80

¹⁷² Amalia Ribi Forclaz, "From Reconstruction to Development: The Early Years of the Food and Agriculture Organization (FAO) and the Conceptualization of Rural Welfare, 1945-1955." *International History Review* 41, no. 2 (2019): 351–71

among the regions were apparent. Especially in developing countries, the growth rates of agriculture and agricultural incomes were at distinct levels.

By the 1960s, increasing the availability of food in developing countries was still prominent. At the same time, problems such as hunger and malnutrition still exist in these countries. It was acted with the expectation that these problems would be overcome at the same speed by providing economic and social development with rapidly developing technology¹⁷³. The Asian region, especially China, should be shown as an example because the production rates of the basic foods in the region, which are rice and wheat, increased by the developing agricultural technologies in irrigation and fertilization systems and helped to contribute to its economic growth¹⁷⁴. In 1961, The World Food Programme was established by The FAO and the UN to assist socio-economic growth in developing countries, fight hunger and undernourishment, and manage international food aid from developed countries that had a surplus of food and resources. However, Sinha criticized the small number of funds for this program as just symbolic¹⁷⁵. With the World Food Programme (WFP) initiatives, FAO participated in projects from establishing the idea of global food reserves to facilitating feeding schemes for preschool. Although the establishment of global food reserves has failed to achieve, food aid and food surplus programs have expanded.

The 1970s were an important turning point for FAO in every sense¹⁷⁶. Several new organizations have emerged, and that led to a growing interest in the agricultural and food sector globally. Nevertheless, FAO felt new organizations as competitors. In

¹⁷³ FAO, "The State of Food and Agriculture 1963." (Rome: FAO, 1963)

¹⁷⁴ FAO, "The State of Food and Agriculture 1968." (Rome:FAO, 1968)

¹⁷⁵ Sinha, R. P, "World Food Security". *Journal of Agricultural Economics*, 27, no. 1 (1976): 121–35.

¹⁷⁶ Maria Sassi, "The History of Food Security: Approaches and Policies," *Understanding Food Insecurity*, 2017, p. 96

addition, the Consultative Group on International Agricultural Research (CGIAR), which was a bunch of donor groups, was established under the support of the World Bank. In 1971, however, FAO raised concerns over rivalry and successfully put them in the advisory position.¹⁷⁷. In 1972, UNEP was established to raise awareness of environmental problems that have increased negative impacts on agriculture and water, so it created a new challenge for FAO's influence and priorities on these areas. On the other hand, the major problem emerged with the 1973 "global food crisis" and led to questioning the credibility of the FAO¹⁷⁸. The increase in the global food prices and the export quotas that governments started to implement led to the deepening of the crisis. In this situation, FAO took a passive role and was criticized for not noticing this crisis beforehand.¹⁷⁹ For this reason, criticism and dissatisfaction led to the establishment of two new organizations: the International Fund for Agricultural Development (IFAD) and the World Food Council. Despite this, FAO continued to operate and manage projects and aid programs. During the 1970s, it undertook a series of responsibilities in the preparation of international contracts, in the import and export pricing of food products, and in taking quick action by creating a global information system. In addition to the "State of Food and Agriculture," which it regularly publishes every year, it has also published reports in many fields. Changing global structures and situations have caused FAO to expand its vision and goals. In addition, FAO, which emerged as a unique organization in food and agriculture, changed with new actors and started to take place in a global and multilateral position.

The period between 1980 and 2007 was seen as a challenge for FAO from all angles¹⁸⁰. In the 1980s, when the agricultural sector began to decline compared to fields such as

¹⁷⁷ Leif E. Christoffersen, et al. "FAO: The Challenge of Renewal". (Rome:FAO, 2007). p.82

¹⁷⁸ Alison Small and O'Broin Síle, "70 Years of FAO: 1945-2015" (Rome: FAO Office for Corporate Communication, 2015).

¹⁷⁹ Leif E. Christoffersen, et al. "FAO: The Challenge of Renewal". (Rome:FAO, 2007) p.82
¹⁸⁰ Ibid. p.85

industry and technology. For this reason, the decline in FAO's agricultural programs in developing countries has led to a diminished role for FAO. It has been an important turning point for FAO to support strategies and policies with a national or regional focus in this period when countries' desire to develop their own national programs has increased. Unfortunately, the transfer of the financial programs of EPTA and Special Fund, which FAO received an extra budget from them during the 1970s, to the United Nations Development Programme (UNDP) had a devastating effect. FAO received only five percent extra-budgetary in 2000¹⁸¹. On the other hand, investments and development programs in the agricultural sector shifted their direction to industry and technology programs. Among the most important reasons for this was stated that the high expectations in the agricultural sector did not fully meet the commitments of the countries. Furthermore, emphasis was made at the 1987 FAO Conference to re-talk FAO's aims and programs, act in greater coordination with UN agencies, and strengthen its advisory role in policymaking¹⁸². However, the major budgetary crises in the UN institutions in the 1980s caused a shrinking in the grant and budget programs of FAO. In the 1990s, with the goal of expanding its role, FAO began to establish a structure that would allow it to return to previous nature¹⁸³. In 1994, In Rwanda, FAO conducted its first emergency operation and then continued mostly in Africa¹⁸⁴. It aimed to conduct coordinated work with local communities and NGOs in a country to increase agricultural production and recover the crisis-affected regions as soon as possible. In addition, in this period, when the importance of international cooperation was frequently emphasized, the financial support of international organizations, NGOs, and high-income countries became significant. Many steps have been taken, such as efforts to strengthen coordination between field offices, joint arrangements

¹⁸¹ Ibid. p.86

¹⁸² Ibid. p.87

¹⁸³ Ibid. p.87

¹⁸⁴ Pingali, Prabhu, Luca Alinovi, and Jacky Sutton.. "Food Security in Complex Emergencies: Enhancing Food System Resilience." *Disasters* 29: 5–24: (2005)

with other UN institutions and organizations, programs to improve financial situations, enhancing cooperation among developed and developing countries, and the creation of an independent evaluation system. Nevertheless, the most important of these efforts was the World Food Summit held in 1996¹⁸⁵. Ensuring food security and fighting against hunger and poverty once again gained momentum in the international area.

The food crisis of 2007/2008 led to encourage FAO to enhance its multinational capacity to maintain food security at the global level. Moreover, the FAO High-Level Conference on World Food Security was held in 2008 to discuss the market-based problems with the assistance of WTO and to solve the escalation of food prices¹⁸⁶. FAO established close relations with developed and developing countries for the achievement of the Millennium Development Goals adopted by 189 countries in 2001¹⁸⁷. It was aimed to realize global development to bridge the gap between North-South and developed-developing countries. However, these targets could not be achieved as desired, and the Millennium Development Goals were updated as SDGs (Sustainable Development Goals) in 2015¹⁸⁸. As can be seen, even though FAO provides finance and enhances the contribution of these goals globally, states are still the main determining actors. FAO's close relationship with these targets should not be overlooked.

¹⁸⁵ Matias Margulis, 'The regime complex for food security: Implications for the global hunger challenge'. Global governance 19, no. 1 (2013): 53–67.

¹⁸⁶ Matthew Canfield, Molly D. Anderson, and Philip McMichael, "UN Food Systems Summit 2021: Dismantling Democracy and Resetting Corporate Control of Food Systems." Frontiers in Sustainable Food Systems. 2021

¹⁸⁷ Matias Margulis, 'The regime complex for food security: Implications for the global hunger challenge'. Global governance 19, no. 1 (2013): 53–67.

¹⁸⁸ Jane Battersby, "MDGs to SDGs–New Goals, Same Gaps: The Continued Absence of Urban Food Security in the Post-2015 Global Development Agenda." *African Geographical Review* 36. No.1: (2017). 115–29

3.3. The Organizational Structure of FAO

FAO, as a specialized agency of the UN, has its own governing bodies and structures and has a membership system apart from the UN. Today, members have reached 194 within one member organization (the EU) and two associate members (the Faroe Islands and Tokelau)¹⁸⁹. The governing bodies and structures have consisted of the Constitution, the Council with a chairperson, the Conferences, and the Committees. The Conference and Council adopt decisions and actions, and Committee is in an advisory position¹⁹⁰. Members agree to sustain common prosperity and to promote joint actions by signing the Constitution. They intend to maintain better conditions for the people under their authority, improve their food systems efficiently, and eliminate hunger and poverty by joining the world economy.

The FAO's supreme political organ is "the Conference". Each member states have a representative to make decisions and vote equally. Policies and decisions are taken by consensus vote, but for the constitutional changes, it is two-thirds of the majority vote. All members have a right to vote unless there is a problem with the payments to be made to the organization. If the problems in the payments are checked, and it is proven that the problem is caused by reasons beyond the control of the member country, they can have the right to vote again¹⁹¹. The Conference has a meeting once every two years regularly, but if it is an urgent issue, they will have a special session. The basic duties of the Conference are to decide the policy and the budget of the FAO. It advises its

¹⁸⁹ OECD/FAO "International Regulatory Co-operation and International Organizations: The Case of the Food and Agriculture Organization of the United Nations (FAO)", 2016

¹⁹⁰ Leif E. Christoffersen, et al. "FAO: The Challenge of Renewal". (Rome:FAO, 2007)

¹⁹¹ FAO and United Nations, "Basic Texts of the Food and Agriculture Organization of the United Nations." I–II: 245. (2017)

members, other international organizations, and NGOs on the issues related to food, agriculture, nutrition, and so on. If there is a need, the Conference can establish Regional Conferences that operate by it. Moreover, Director-General is appointed by the Conference for four years. Director-General joins the meetings, prepares proposals for action, and runs the work of it but has no right to vote.

"The Council" is the second-level body of the FAO and acts as an executive organ of the FAO¹⁹². The Council has an Independent Chairman that is elected by the Conference to implement the works. In 1947, after the establishment of FAO, there was an Executive Committee, but it later turned into the Council. At that time, eighteen member states and their representatives were chosen to become the Council's members.¹⁹³ However, today there are forty-nine member states' representatives that are elected by the Conference in the Council. Furthermore, the Council is formed by seven regional groups: Africa, Asia, Europe, Latin America and the Caribbean, the Near East, North America, and the Southwest Pacific¹⁹⁴. The Conference chooses among them for three-year terms by respecting the balance between states concerning food and agricultural activities geographically and considering members' participation which has contributed to the success of the FAO in the work of the Council¹⁹⁵. In its functions, the Council prepares agenda for the situation of food and agriculture to the Conference, analyzes the situation of food and agriculture and related issues arise from them, and gives assistance to the Conference or Director-General's calls by examining the issues¹⁹⁶. The Council manages the financial and budget works. It advises the

¹⁹² OECD/FAO, "International Regulatory Co-operation and International Organizations: The Case of the Food and Agriculture Organization of the United Nations (FAO)", 2016.

¹⁹³ Ralph W Phillips.. "FAO: Its Origins, Formation and Evolution 1945-1981." 1981, pp.1-197.

¹⁹⁴ Leif E. Christoffersen, et al. "FAO: The Challenge of Renewal". (Rome:FAO, 2007).

¹⁹⁵ OECD/FAO, "International Regulatory Co-operation and International Organizations: The Case of the Food and Agriculture Organization of the United Nations (FAO)", 2016.

¹⁹⁶ FAO, United Nations. "Basic Texts of the Food and Agriculture Organization of the United Nations." I–II: 245. (2017).

Conference's budget and sets the adjustments for the Programme of Work and Budget and Committees of FAO in line with the Conference. It also prepares funds and loans for emergency matters and decides on financial payments to be received from member states.

Moreover, there are two Committees that act jointly with and assistances to the Council: The Council Committee, which consists of the Programme Committee, the Finance Committee, and the Committee on Constitutional and Legal Matters, and the Technical Committee, which consists of the Committee on Commodity Problems, on Fisheries, on Forestry, and on Agriculture¹⁹⁷. They inform the Council of many issues that they related to and report to the Conference on policy and regulatory issues. There is also a special committee which is the Committee on World Food Security, and it has an intergovernmental and international position in the FAO. It aims to reach SDGs and contributes World Food Summit monitoring states of food and agriculture. This committee also reports to ECOSOC (United Nations Economic and Social Council).

The Council Committees' main task is to assist the Council in the matters of operational, monetary, and legal management. Proposals and programs are made by the representatives of the member states selected by the Council, and these proposals and programs which to be made or made are reviewed by convening twice a year¹⁹⁸. On the other hand, it should be noted that the Technical Committees form the basis of FAO's global work. Each of these committees contributes to the Council by making assessments and evaluations on different issues. They play a significant role by specializing in their subject matter and developing policy tools. For example, the Committee on Agriculture communicates and advises the Council on its assessments of agriculture and food and forms the basis for the organization's work on these issues.

¹⁹⁷ FAO, United Nations, "Basic Texts of the Food and Agriculture Organization of the United Nations." I–II: 245. (2017).

¹⁹⁸ OECD/FAO, "International Regulatory Co-operation and International Organizations: The Case of the Food and Agriculture Organization of the United Nations (FAO)", 2016.

In the same way, it creates recommendations for the agriculture and food of the country by specifically working on the demand from the member states. In general, the committees do not go beyond their own subjects. For example, Committee on Agriculture does not work on studies involving forest issues but can point this out to the Committee on Forestry¹⁹⁹.

There are Statutory Bodies that are concerned with several specific issues²⁰⁰. These topics are covered extensively, from agriculture to production, from health to trade, and from food to land and water development. Likewise, it is possible to form partnerships with NGOs or other international organizations through FAO. They can create statutory bodies to implement and act on the Organization's operations²⁰¹. Besides, FAO is served by a prominent Secretariat with numerous professional staff and experts. Half of the staff are located at headquarters in Rome while the rest of them are at regional offices. The regional offices are decentralized offices and consist of five regional offices, nine sub-regional offices, and 142 country offices. Both regional and sub-regional offices' duties are to identify, plan and manage the FAO's operation in the regions and sub-regions. Additionally, 142 country offices give assistance to FAO to create connections with the government, local organizations, and NGOs for developing projects and policies and working on the immediate needs in the subject of hunger, undernourishment, food, and other sectors as well²⁰².

¹⁹⁹ FAO, United Nations, "Basic Texts of the Food and Agriculture Organization of the United Nations." I–II: 245 (2017).

²⁰⁰ OECD/FAO, "International Regulatory Co-operation and International Organizations: The Case of the Food and Agriculture Organization of the United Nations (FAO)", 2016.

²⁰¹ Ralph W Phillips.. "FAO: Its Origins, Formation and Evolution 1945-1981." 1981, pp.1-197.

²⁰² OECD, "Global Food Security: Challenges for the Food and Agricultural System", OECD Publishing. (2013)

In addition, the Programme of Work and Budget (PWB) manages the budget and financial administration. There is an obligation to each member to contribute to the FAO's budget in an amount that is determined by the Conference.²⁰³ The PWB's program and activities can be viewed by the Programme Committee for deciding priories or assisting. It determines the loans, funds, and budget for each program and activity in each biennium²⁰⁴. The PWB also prepares information on extra-budgetary funds or additional funds. Thus, a report is created by conducting research with the Secretariat on which sector or region this additional budget should be added to, and this data is forwarded to the Council or the Conference in an advisory manner.

3.4. The Objectives and Policies of FAO

FAO's objective and policy are centered around four pillars or dimensions of ensuring food security: availability, accessibility, utilization, and stability²⁰⁵. These pillars define the fundamentality of food security and shape FAO's policies as well. The framework presented by FAO underlines that secure food is ensured when adequate food is available, people have access to it and utilization is at the best level, and all three dimensions maintain stability over time²⁰⁶. Firstly, the availability of food can be defined as having a sufficient amount of safe and nutritious food that does not contain

²⁰³ OECD/FAO, "International Regulatory Co-operation and International Organizations: The Case of the Food and Agriculture Organization of the United Nations (FAO)", 2016.

²⁰⁴ FAO, United Nations. "Basic Texts of the Food and Agriculture Organization of the United Nations." I–II: 245, (2017)

²⁰⁵ FAO, "Declaration of the World Summit on Food Security". (Rome: FAO, 2009).

²⁰⁶ OECD, "Global Food Security: Challenges for the Food and Agricultural System", OECD Publishing. (2013) <u>http://dx.doi.org/10.1787/9789264195363-en</u>

harmful substances, either domestically produced or imported²⁰⁷. Availability ranks first as the most key factor because even if other dimensions are provided, it is not possible to talk about food security if food is not readily available. Availability is ensured when people in an area have constant access to adequate and safe food. The proximity of these people to food and the frequency of access should also be noted²⁰⁸. This dimension focuses more on the agricultural production and supply of food, giving priority to the improvement and development of the national food production and stability of the global food supply chain.

Secondly, food accessibility refers to access to available food in terms of physical, economic, and socio-cultural aspects. The physical aspect mentions situations where there are no problems in the transportation of food or where people can reach food in a healthy way. The socio-cultural dimension defines the barriers faced by a group or individual who can physically and economically access food because of being from a social group or gender. However, the most important problem is economic access because it deals with many topics such as problems in income distribution, volatility in global food prices, high food prices, and unemployment. It should be noted that hunger and poverty around the world, both the lack of available food and the difficulty of accessing it economically²⁰⁹.

Third, the utilization of food draws attention to safe and nutritious food and the importance of these non-food items. In addition to ensuring the availability and access of food, meeting dietary needs, nutritious food, and safety are prominent. At the same

²⁰⁷ HLPE. "Food security and nutrition: building a global narrative towards 2030". A report by the High-Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, (Rome:2020)

²⁰⁸ Maria Sassi, "Food Security Basics." Understanding Food Insecurity: (2018), 1-30

²⁰⁹ M. Napoli, P.D. Muro and, M. Mazziotta, "Towards a Food Insecurity Multidimensional Index," (Rome: FAO,2011)
time, this element covers topics such as the safety of drinking water, the storage and preparation conditions, and the sanitation of food.

Finally, fourth, stability of food encompasses the availability, access, and use of food, both now and in the future, and encompasses these three dimensions separately. Thus, food stability is located more dynamically apart from others.²¹⁰ The stability of food also stresses the remaining that food security needs to be achieved even the situations occur such as wars, climate change, and economic crises. In addition, it is emphasized that two concepts shape the dimension of food security and FAO policies: "agency and sustainability"²¹¹. Agency is closely related to the development process and draws attention to injustices within food systems. It also stresses food preferences for all people, promoting the idea of freely choosing what to produce, eat, distribute, etc. Moreover, it promotes the engagement of individual or group-level powers in food security policy and processes. Sustainability is another dimension with which food security is linked²¹². Although it is understood as the same as stability, it stands out by emphasizing the continuity of every stage of food systems and the delivery of reliable and sufficient food to future generations. It plays an effective role in ensuring food security in a sustainable way in all areas of food systems by reinforcing other dimensions. However, agency and sustainability are not officially accepted as dimensions, but they influence food security enough. In short, they all relate to each other. This connection can be seen in if food is available in a country but not produced in a sustainable way, and then it creates risk in the long-term accessibility of food because it risks food utilization and stability.

Additionally, policies have been shaped by focusing on the necessity of every dimension of food security. FAO assists strategies and programs for member countries

²¹⁰ Maria Sassi, "Food Security Basics." Understanding Food Insecurity: (2018) 1–30.

²¹¹Jennifer Clapp et al., "Viewpoint: The Case for a Six-Dimensional Food Security Framework," *Food Policy* 106 (2022)

²¹² Ibid. p.4

by strengthening their food systems and national policies towards hunger, poverty, resilience, and productivity. There are challenges that affect dimensions of food security, so FAO tries to boost their member states to respond to those challenges for elimination. FAO gives guidance to member states' actions for the availability of food in the areas which decrease yield gaps and climate change effects, enhance investments, research, and developments in the agricultural sector for both public and private sectors and eliminate food losses and wastes²¹³. FAO also encourages local producers and supports women farmers in its projects. In the accessibility area, FAO's policies embrace all people without any restrictions on their gender, age, or place they live and deal with inequalities. Furthermore, FAO aims to increase food production levels by strengthening small-scale and local producers, so this can reduce dependency on food imports of the country, and all people can access enough food within a country without paying higher prices. For example, In Africa, the FIRST (the Food Security Impact, Resilience, Sustainability, and Transformation) project aims to target food availability and people's access to nutritious food while creating sustainable agriculture²¹⁴. This project was negotiated in 2015 with the funding partnership of the EU, and after the assessments and feasibility works in the key areas for nineteen countries in 2019, the EU and FAO have met both local producers and representatives of government to implement actions in those areas²¹⁵. Moreover, FAO manages the joint project with the Latin America and Caribbean Parliament to advise obesity and food loss, and waste areas. For instance, in the area of utilization, FAO deals with decreasing obesity levels and unhealthy food besides promoting more organic, sustainable, and safe foods for every people²¹⁶. Another one is in Yemen, one of the poorest countries, projects on food utilization are conducted by FAO and partners.

²¹³ HLPE. "Food security and nutrition: building a global narrative towards 2030". A report by the High-Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. (2020)

²¹⁴ FAO, "Resources, Partnerships – Impact 2020". (Rome:FAO, 2020)

²¹⁵ Ibid. p.35

²¹⁶ Ibid. p.69

Access to water, sanitation, hygiene status, and infrastructure problems, which are one of the main problems of the country, cause FAO's priorities to emerge as target areas. A project achieved in cooperation with the International Organization for Migration in 2018 and it was aimed to improve access to water, sanitation, and hygiene status²¹⁷. Lastly, the policies and objectives highlight long-term solutions and effective continuity in the other dimensions, stabilization, sustainability, and agency. The policies of FAO consider climate crisis effects and environmental disasters. Particularly, it tries to offer solutions to problems such as migration arising from conflict and crisis areas. For example, because of the crisis in Syria, some projects are being implemented both in Syria and in the neighboring country, Turkey²¹⁸. These projects are aimed at improving infrastructures in the damaged agriculture and livestock sector in Syria, helping the development of the country, creating their own livelihoods by recruiting SuTPs (Syrians under Temporary Protection) workforce in Turkey, and strengthening social and economic cohesion. With the partners of FAO, UNHCR, and the EU, it is tried to ensure the continuity of the projects by giving priority to the agricultural sector. Furthermore, FAO's goal is to strengthen its projects and policies within the partners as well as member countries by improving processes in more sustainable ways to ensure food security 219 .

3.5. International Conflict and Cooperation within FAO

The establishment of FAO paved the way for global construction in the field of food and agriculture, which was one of the critical issues after the war. It was shaped by the founding member countries with the aim of ending hunger by ensuring that food

²¹⁷ Ibid. p.67

²¹⁸ Ibid. p.27

²¹⁹ FAO. "Challenges and Opportunities in a Global World". (Rome:FAO, 2019)

security and agricultural products reach all people equally²²⁰. Member countries have influenced FAO's agenda on different topics over the years, acting from time to time according to their own national interests. Although FAO offers cooperation and open communication like other UN structures in terms of its founding purpose, it is seen that the national interests and struggle for power of the countries also cause conflicts. The biggest reason for these conflicts is the imbalance between countries²²¹. These imbalances become too prominent both economically and structurally. For example, the vast majority of Africa is struggling with hunger while Europe focuses on how to prevent food waste and, thus, it can change policies in a different direction within FAO.

States have the sovereign authority to implement their own food politics by securing food and creating access to every citizen within their borders. They can export their goods and import and create their own strategies in the global market by signing agreements bilaterally²²². Their intentions differ according to their political and economic situation, such as how much they produce or which food products they need to import. In that regard, clearly can be seen the changes in the national policy agendas. Moreover, the first crack in FAO occurred after its establishment. The first FAO Director-General, Lord Boyd Orr, tried to create a mechanism that is called the World Food Board for managing agricultural prices and reserves with the cooperation of countries²²³. This mechanism also could accelerate agricultural development and quickly respond to food security problems. However, this mechanism did not finish

²²⁰ Nora McKeon, "Food Governance: A Rapid Historical Review," in *Food Security Governance: Empowering Communities, Regulating Corporations*, ed. Nora McKeon (Taylor & Francis, 2015), pp. 11-30.

²²¹ John W. Mellor, "Global Food Balances and Food Security." *World Development* 16, no.9: (1988) 997–1011.

²²² Tim Josling, "The World Food Problem. National and International Aspects." *Food Policy* no. 1: (1975) 3–14

²²³ Nora McKeon, "Food Governance: A Rapid Historical Review," in *Food Security Governance: Empowering Communities, Regulating Corporations*, ed. Nora McKeon (Taylor & Francis, 2015), pp. 11-30.

completed because of strong opposition from the biggest food traders, the US and the UK. McKeon states that in Boyd Orr's perspective, "neither the UK nor the US did not ready to lose their control under an organization even though their interest could shape the organization accordingly."²²⁴ On the contrary, the US kept its bilateral relations besides furthered its intentions in international organizations. It raised its food and financial aid as well. Most of the Southern countries were still under the control of Western powers that tried to shape the world into their own ambitions. Moreover, those Western powers began to dominate their economic power in the post-war era, so both the UK and the US did not want to establish a new mechanism that could interfere with their trade and economic interest²²⁵. In addition, there were numerous poverties in the developing and low-income countries, and Soviet influence was not desired to reach these countries. Hence, food aid was used increasingly to deal with those issues. The Western powers wanted to dominate the developing countries with their financial aid, agricultural technology, and technics in the name of modernization by getting assistance from the FAO and the World Bank²²⁶. According to Margulis, Canada, Australia, and also the European Community (EC) that is replaced by the European Union (EU), produced and exported grain and financially became important aid donors²²⁷. They cooperated within FAO or created bilateral agreements with developing countries for assistance with technical and agricultural equipment such as machinery, seeds, and even pesticides. Furthermore, the developed countries imported raw materials and goods at lower prices from the developing countries that were highly dependent on them. This clash affected FAO's fundamental aim because the FAO was there to eliminate inequalities besides ending poverty and hunger. Assistance to developing countries, both technical and financial, from FAO led developed countries

²²⁴ Ibid. p.13

²²⁵ Ibid. p.14

²²⁶ Ibid.

²²⁷ Matias Margulis, 'The regime complex for food security: Implications for the global hunger challenge'. Global governance 19, no. 1 (2013): 53–67.

to enhance their relations with developing countries. It can be seen that both countries' and FAO's behavior and goals needed to be questioned. In detail, developed countries had become more industrialized than the rest of the world, and they produced and consumed more to feed their growing population²²⁸. They implemented their own food policy to ensure food security and productivity and tried to influence and change the direction of the global market and even international agreements. The US and Canada also wanted to maintain their position as the biggest exporters of agricultural goods in the post-Cold War era and to keep their positions in the economy of global food. On the contrary, many developing countries faced the dilemma that they needed to choose either expansion in agriculture production or advancement in the industry sector. This sector began to rise in many aspects, so they wanted to be a part of the global market and trading system to pursue their objectives in industrialization. Tim Josling mentioned that their interest is affected by the global situation²²⁹. The Asian countries with the growing population and African countries with lack-resources faced this dilemma. Nevertheless, they need to consider their agricultural expansion and production as an integral part of food security.

Nonetheless, by the 1980s, the FAO began to stress the role of agricultural development and national policies on food security heavily with the initiatives of the IMF and the World Bank²³⁰. This idea on agriculture and food gained an amount of approval at that time. The strong focus on national policies on agriculture and food prepared the ground for debates to get involved in neoliberal adjustment plans to eliminate tariffs and quotas on agricultural goods. Moreover, those tariffs and quotas were seen as a threat to improving the productivity of agriculture and reducing the high prices of food. However, the developed countries' initiatives and structural adjustment

²²⁸ Tim Josling, "The World Food Problem. National and International Aspects." *Food Policy* no. 1: (1975) 3–14

²²⁹ Ibid.

²³⁰ Humberto González, "Debates on Food Security and Agrofood World Governance." *International Journal of Food Science and Technology* 45, no.7: (2010) 1345–52.

plans of IMF and the World Bank to encourage developing countries to integrate into the global market created several problems. For instance, in developed countries, agriculture became more industrialized with the significant changes in technology. They were able to produce more agricultural goods in time. However, developing countries with low productivity levels were not efficiently industrialized²³¹. Technological improvements were slow contrary in developed countries, so the developing countries tried to reach higher levels. Moreover, the aim of these developing countries to reach the levels of developed countries became a problem with the accumulation of the debts of the loans they took to change their own structures and provide technological progress. The most important reason for this was that financial and structural support was not used to produce food from time to time²³². The pioneer of structural support resulted in the World Bank's large fiscal deficits and trade imbalances. When governments try to fix the crisis with a tough policy on monetary, it could result in challenges such as unemployment and access to food. Those structural adjustment programs could create more deep problems²³³. In that regard, the developed countries did not want to lose their importer countries in the global market, so they also increased their food aid to target developing counties. Yet, it could not be considered as one of the efficient ways to assist because the food aid was not nonstop. Therefore, rising problems led to the establishment of WTO in 1995 for regulating agricultural goods in a fair-trade system. Hence, the FAO and the US supported the elimination of costs in the agricultural sector²³⁴. The developed countries got specific reduction goals to further their assistance in agriculture. After the establishment of WTO and a few rounds of trade negotiations, the FAO increased its role in framing

²³¹ John W. Mellor, "Global Food Balances and Food Security." *World Development* 16, no.9: (1988) 997–1011.

²³² Ibid. p.1000

²³³ Ibid. p.1003

²³⁴ Amalia Ribi Forclaz,. "From Reconstruction to Development: The Early Years of the Food and Agriculture Organization (FAO) and the Conceptualization of Rural Welfare, 1945-1955." *International History Review* 41, no. 2 (2019): 351–71

food security within the negotiations in WTO²³⁵. During the negotiations, it was discussed that the tariffs and quotas on agricultural goods of the developed countries should be reduced as much as possible²³⁶. These debates have become a different dimension as developing countries often take policy measures to ensure their own food security. Most importantly, the rising food prices in 2007-2008 became a crisis, and the successive trade measures caused serious problems between developing and developed countries²³⁷. FAO and WTO kept framing the elimination of trade barriers and ensuring food security in a better system²³⁸. In addition, the World Bank admitted that using agriculture as an instrument for the growing tool was a strategic failure in its 2008 development report²³⁹. Besides, many African countries also raised their voice to criticize the impacts of structural adjustment programs. Moreover, several FAO members were influenced by the crisis and shaped their food policies because of the rising food prices, ineffective adjustment programs, and trade barriers²⁴⁰.

FAO still maintains and stresses the significant role of food security right after the 2007-2008 food crisis. In this context, countries started to shape their food security policies as well. In the European Union, the Common Agricultural Policy enhanced their concentration on issues of food security and trade, and major food-exporting

²³⁵ Ibid.

²³⁶ Margulis, Matias. 2012. "Global Food Security Governance: The Committee on World Food Security, Comprehensive Framework for Action and the G8/G20." *The Challenge of Food Security: International Policy and Regulatory Frameworks* 44(0): 231–54.

²³⁷ Arild Aurvåg Farsund, Carsten Daugbjerg, and Oluf Langhelle. "Food Security and Trade: Reconciling Discourses in the Food and Agriculture Organization and the World Trade Organization." *Food Security* 7, no.2: (2015) 383–91.

²³⁸ Ibid. p.386

²³⁹ Nora McKeon, "Food Governance: A Rapid Historical Review," in *Food Security Governance: Empowering Communities, Regulating Corporations*, ed. Nora McKeon (Taylor & Francis, 2015), p.22.

²⁴⁰Humberto González, "Debates on Food Security and Agrofood World Governance." *International Journal of Food Science and Technology* 45, no.7: (2010) 1345–52.

countries such as the BRICS have emerged, leading to the creation of a multilateral food system²⁴¹. In 2009, Brazil, India, Mexico, South Africa, China, Argentina, Australia, and Egypt came together to organize a summit to overcome the obstacles to the food crisis. They promised to increase their donations by emphasizing the necessity of sustainable agriculture, especially to avoid food crises that may occur in the future. Switzerland also donated large amounts to prevent food crises. In addition, it increased its donations to programs for small-scale farmers to increase their productivity with sustainable agriculture and to communities that have difficulty accessing food through the World Food Program. As mentioned before, the UN Millennium Development Goals could not reach the desired targets by 2015 despite the technical and financial contributions of FAO²⁴². The desired targets could not be fully achieved, especially due to the insufficient contributions of the countries, their low efforts, and the focus of national policies on different ways. As can be seen, countries' national interests and the power struggle, even in FAO, highly affect the global action for food security and the achievement of common goals. They are the only and vital actors in eliminating those problems, but FAO's national and global efforts and objects still remain crucial for countries²⁴³.

3.6. FAO's Relations with other International Bodies

The FAO is one of the vital UN agencies that was established right after the Second World War. Today it has become the most rooted and enlarged organization in the

²⁴¹Nora McKeon, "Food Governance: A Rapid Historical Review," in *Food Security Governance: Empowering Communities, Regulating Corporations*, ed. Nora McKeon (Taylor & Francis, 2015), p.23.

²⁴²Alison Small and O'Broin Síle, "70 Years of FAO: 1945-2015" (Rome: FAO Office for Corporate Communication, 2015). p.94

²⁴³ Ibid.

UN²⁴⁴. The relationship and shared norms with the UN have developed in parallel. FAO's focus is to achieve global prosperity by making improvements in all levels of food systems to ensure food and nutrition security and prevent hunger and poverty in the world. With this logic, the 17 Sustainable Development Goals, which the UN proposes to reduce and eliminate through a global effort and cooperation, should also be highlighted²⁴⁵. Many of these goals, such as ending hunger or dealing with the effects of the climate crisis, are closely related to FAO's strategies and programs with member countries in line with these goals. FAO considers progressing at both regional/country and global levels with the support of the UN and its agencies as well. For instance, the UN World Food Program gives support for providing food aid to developing countries, while the International Fund for Agricultural Development of the UN was keeping assistance in financial areas to eliminate poverty and hunger with FAO²⁴⁶. These UN special agencies are still increasingly giving assistance to achieve SDGs. While acting on a global scale to ensure food security, it is seen that regional and non-governmental organizations cooperate with FAO and the UN at the same time. Moreover, refugee crises, which are the cause of increasing conflicts at the regional level, also affect areas of food security such as access to food and availability of healthy food. For this reason, the World Health Organization and NGOs can cooperate with FAO and UN to overcome the refugee crisis, whose effects are seen regionally and globally, and to ensure food security. Considering that WHO is related to the field of food security, it aims to create effective solutions regionally with governments and FAO to ensure that refugees have access to healthy and nutritious food²⁴⁷. According

²⁴⁴ Carolin fand Olivier De Schutter. "The Food and Agriculture Organization of the United Nations: Advancing the Right to Food to Promote Public Health." *Human Rights in Global Health: Rights-Based Governance for a Globalizing World* (2018): 261–80.

²⁴⁵ UN. "The Sustainable Development Goals Report." (2020): 1–68.

²⁴⁶ Matias Margulis,. "The Regime Complex for Food Security: Implications for the Global Hunger Challenge." *Global Governance* 19, no.1: (2013) 53–67.

²⁴⁷ Matias Margulis, "Global Food Security Governance: The Committee on World Food Security, Comprehensive Framework for Action and the G8/G20." *The Challenge of Food Security: International Policy and Regulatory Frameworks* 44: (2012) 231–54.

to MacAuslan, the FAO and WHO make overlapping programs and decisions on nutrition²⁴⁸. In the same way, they draw attention to the food and health issues of children in partnership with UNICEF. Foremost among these, they developed collaborations on children's access to nutritious and healthy food, the situation of obesity and hunger in children, and children's fundamental rights. In this scope, it has expanded to various areas such as access to water and hygiene, the right to shelter, and breastfeeding mothers' access to healthy food.

Furthermore, FAO strategically maintains its relations with other regional and intergovernmental organizations such as the EU, ASEAN, and African Union. Especially the relationship with the EU is top-notch because the European Union and the FAO have lots in common. The European countries have established their ties with FAO as donor countries initially and pursued their assistance in both monetary and field programs²⁴⁹. The EU is a member organization of FAO, and EU members individually represent themselves at FAO. Furthermore, The EU joins the decision-making process in the FAO. Thus, this affects both institutions' policy areas and occurs with overlapping agendas as well. They focus on achieving strategic partnerships in various areas. For instance, food security, combating hunger and poverty, sustainability, and resilience to the climate crisis become significant both in the EU's own policies and in various countries' programs that are planned under the cooperation of EU-FAO²⁵⁰. According to Schild, FAO influences five policy areas of the legal order of the EU that are food law, food security, forestry, animal health, and

²⁴⁸Ian MacAuslan. "Hunger, Discourse and the Policy Process: How Do Conceptualizations of the Problem of 'hunger' Affect Its Measurement and Solution?" *European Journal of Development Research* 21, no.3: (2009) 397–418.

²⁴⁹ Robert Kissack, "Pursuing Effective Multilateralism the European Union, International Organisations and the Politics of Decision Making" (London: Palgrave Macmillan UK, 2010). pp. 120-130

²⁵⁰ OECD/FAO, "International Regulatory Co-operation and International Organizations: The Case of the Food and Agriculture Organization of the United Nations (FAO)", 2016.

fisheries²⁵¹. The scholar argued the effects of FAO on external and internal EU policies. The FAO's influence on food security and forestry is more strongly reflected in the EU's external policies. Moreover, FAO and the EU are actively involved in agriculture and food security. While the EU usually provides financial assistance to projects, FAO accelerates fieldwork and research for these projects. The financial process is carried out with the Financial and Administrative Framework Agreement (FAFA), signed by the UN Secretariat and the European Commission in 2003. The relationship between the EU and FAO continued to be shaped in the following years. FAO increases its cooperation with partner countries in the field of food security with the EU's active involvement in strategic plans as a donor. In addition, despite the fact that EU members increased trade restrictions in the face of the 2008 food crisis, the EU has created a budget for large amounts of food aid²⁵². Even though there is criticism about the EU's Common Agricultural Policy due to causing overproduction and not being truly green, it remains one of the EU's longest areas of cooperation on food security and agriculture. It should be seen that both the EU and FAO cooperate with their overlapping policies by trying to be effective on a global scale.

Additionally, the regional efforts among organizations or countries together provide a chance to consider food security issues. This leads FAO to increase its ties to take regional or country-level plans with specific programs. For instance, ASEAN members suffer from extreme weather events, pest and disease occurrences that are exacerbated by the climate crisis recently, and undernourishment and hunger in many regions as well²⁵³. Thus, ASEAN and FAO's initial effort is to eliminate hunger by providing available food for people and to reduce the effects of extreme weather by

²⁵¹ Françoise D. Schild, "The Influence of the Food and Agriculture Organization (FAO) on the EU Legal Order," *Between Autonomy and Dependence*, 2012, pp. 217-241.

²⁵² Robert Kissack, "Pursuing Effective Multilateralism the European Union, International Organisations and the Politics of Decision Making" (London: Palgrave Macmillan UK, 2010).

²⁵³ Barry Desker, Mely Anthony, Paul Teng. " ASEAN Food Security: Towards a more comprehensive framework". *ERIA Policy Brief.* (2014) 1-8.

increasing resilience in food systems. In 2013, FAO and ASEAN signed an agreement to enhance the coordination in the areas of agriculture, forestry, hunger, and poverty²⁵⁴. For instance, FAO assists ASEAN to better regional and global solutions to overcome the rising and volatile prices of food. FAO's policies also vary according to ASEAN member's priority areas. In Thailand, FAO has long collaborated with more than eighteen projects worth 4.7 million dollars. Those projects have been made to strengthen food-related problems and secure food. Considering that ASEAN countries like Vietnam and Thailand are second and third worldwide exporters of rice in 2021²⁵⁵, so the region's agricultural products are dependent on climate, which leads FAO to act on reducing those effects and increasing regional cooperation via national strategies and plans. At the end of the day, it should be emphasized that FAO shows the importance of common cooperation by assisting countries with their food security areas a security issue both in national policies and in the global area.

3.7. New Challenges of FAO

FAO continues to further its regional programs and plans via national policies and maintains its role at the international level with other organizations and states by stressing the multi-dimensional nature. FAO faces new challenges in the world and the complexity of food security, so it affects future agendas. Improving food systems and agriculture production, tackling poverty and hunger, mitigating the effects of the climate crisis, avoiding economic problems, and reaching the 17 global SDGs have challenges for FAO and the four pillars of food security.

²⁵⁴ FAO. "ASEAN and FAO Cooperation: Working Together towards Shared Sustainable Development and Food Security Goals." (2014)

²⁵⁵ "*Principal rice exporting countries worldwide in 2021/2022*", M. Shahbandeh, accessed on February 10, 2022, <u>https://www.statista.com/statistics/256005/global-rice-supply-since-2000/</u>

The initial challenge keeps remaining as hunger even though many steps have been taken for decades. The number of people still malnourished and facing hunger is equivalent to eleven percent of the world's population. The reason for the increase, especially in recent years, includes many topics such as the Ukraine-Russian conflict, the effects of COVID-19, and the frequency and extremes of climate events. Moreover, food safety problems, which vary in different regions from malnutrition to obesity, lay the foundations of irreversible problems²⁵⁶. It should be noted that especially malnourished children do not develop cognitively and educationally or cause an increase in the frequency of obesity-related heart attacks. Problems such as malnutrition or obesity affect the individual and household levels as well. According to FAO data, more than thirty-eight million children under the age of five suffered from obesity in 2017^{257} . With the widening of food chains, the trade of processed foods with low nutritional value and the increase in easy access to these foods is also a driving force. At this point, it is inevitable for FAO to take part in the global food chains of healthy foods and operate for the utilization of food. Together, FAO and WHO engage in strategic programs with national governments to conduct research and policies on food safety.²⁵⁸

Another agenda of FAO is the fight against the climate crisis and its effects. Climate change or crisis is emerging as the primary challenge of the food security and agriculture sector today. Climate change affects the dimensions of food security, especially the availability of food. It is stated that due to the negative effects of climate change, people who make their living from agriculture in rural areas will migrate, or

²⁵⁶ FAO. "Challenges and Opportunities in a Global World". (Rome: FAO, 2019)

²⁵⁷ Ibid.

²⁵⁸ FAO. "The future of food and agriculture – Trends and challenges". (Rome: FAO, 2017)

their crops will be inefficient or damaged²⁵⁹. Decreased food production occurs due to soil degradation due to increased frequency and extent of weather events such as droughts or floods or water shortages²⁶⁰. Moreover, water scarcity or soil deterioration increases the possibility of deterioration of arable lands.

Finally, other challenges that should be highlighted are the food problems caused by conflict and the placement of gender equality in food systems. Violent conflicts bring food insecurity and many problems with unceasing tension. Conflicts that occur in countries with food and agricultural resources can affect global food trade and food prices, causing economic problems and problems such as migration²⁶¹. In that regard, FAO continues to work in areas where tensions are escalating. For instance, when the civil war in Syria continued, FAO was running its programs to continue food production there. It should be noted that the destructions caused by war affect the dimensions of food systems and food security. In addition, the position of women affected by the war in food security is key. Women constitute 43 percent of the workforce in the agricultural sector in the world²⁶². Nevertheless, the status, payment, services, and influence of women in agriculture are not as prominent as male colleagues, and they do not have as much access to these fields as male colleagues do. However, FAO strives to increase the equal representation of women by strengthening

²⁵⁹ Colin Sage, "The Interconnected Challenges for Food Security from a Food Regimes Perspective: Energy, Climate and Malconsumption." *Journal of Rural Studies* 29, (2013) 71–80.

²⁶⁰ Lynn McIntyre and Krista Rondeau. "Food Security and Global Health." *Global Health and Global Health Ethics*: (2011) 261–73.

²⁶¹ Martin-Shields, Charles P., and Wolfgang Stojetz. "Food Security and Conflict: Empirical Challenges and Future Opportunities for Research and Policy Making on Food Security and Conflict." *World Development* 119: (2019) 150–64.

²⁶²See also: <u>https://www.fao.org/reduce-rural-poverty/our-work/women-in-agriculture/en/</u> accessed on April 06, 2022

rural and urban infrastructure²⁶³. Hence, empowering women and closing gender-gap in agriculture are covered in national programs.²⁶⁴

3.8. Conclusion

FAO is established with the main aims of overcoming the problems in the food and agriculture sector and ending global hunger in the new post-war world order, so it has a key position as an intergovernmental organization. Since its establishment as the UN's special agency on food and agriculture issues, it has had memberships from all countries except Liechtenstein. In this way, a global role was assumed to overcome the destructions caused by the war on agriculture and food. It has been trying to direct its policies regarding the changing dynamics in the world and to act jointly with other international organizations. However, although FAO undertakes its own policies on food and agriculture, which is its main target, it has shaped its policies from time to time with the influence of major powers and donor countries. Even though countries act for their own interests, FAO assists regional projects through national governments in policy and decision-making processes with a global priority. In this respect, it should be emphasized that the multidimensional and complex nature of food security also has an impact because trying to achieve the goals as a single organization will not have great effects and may not be parallel to the goals of other countries. Thus, FAO acts in parallel with both member states and other international organizations. Still, countries are the prominent power in achieving food security both in national policies and global areas. For this reason, FAO, which has been subjected to criticism many times, is still an important and well-established organization in the field of food and agriculture.

²⁶³ FAO. "The future of food and agriculture – Trends and challenges". (Rome: FAO, 2017)

²⁶⁴ FAO. "Challenges and Opportunities in a Global World". Rome. (Rome: FAO, 2019)

Thus, it helps FAO to play an active role in making strategic decisions by being coordinated with member countries, other organizations, and even local groups.

In addition, FAO engages in strategic programs and collaborations in changing and evolving situations that affect the dimensions of food security. It participates in actions, programs, and solutions to ensure food security by reaching all dimensions. FAO acts globally with national governments in several ways to ensure food security and draws attention to individual food problems. Human or natural-induced challenges to food and agriculture differ. For instance, developing countries struggle with malnutrition and poverty, whereas developed countries face food waste or obesity. Moreover, some parts of the world experience drought and floods, and some with agricultural damage, especially in conflict areas. For this reason, all these challenges faced by food and agriculture can be prevented, and food security can be provided for everyone with common action and effort. It should be emphasized that national governments need to adopt policies to eliminate these food-related problems and ensure food security accordingly.

CHAPTER 4

FOOD SECURITY POLICIES OF THE DEVELOPED AND DEVELOPING COUNTRIES

4.1. Introduction

In this chapter, the national-level food security policies of the USA, China, Egypt, and Brazil, will be covered. By presenting a historical framework of these countries, it is emphasized how their agricultural and food policies have been shaped despite several challenges both at national and global levels. Thus, the political economy, environmental and social situations of these four countries in the areas of availability, accessibility, utilization, and stability of food are specified, and their reflections and effects on agriculture and food policies are detailed. Moreover, along with the historical framework, the economic dimensions of agricultural production and the agricultural sector are shed light on, and the effects on the dimensions of food security are discussed. In this chapter, the main purpose is to show the impact of the complex nature of food security on policies, strategies, and government programs at the national level while trying to show the contribution of the challenges in the global area. This chapter also stresses how food security is actually integrated into the national politics of countries.

This chapter primarily tries to show a wide range of national policies of four countries to ensure food security. In this respect, agricultural and food policies are covered by including their agricultural production capacities, economic and trade performances, and the importance of the agricultural sector of the countries in a historical framework. In the next part, the effects of environmental factors such as climate change and its effects on natural resources, water, and soil are covered. Furthermore, the intensification of the impact of climate change and the effects of natural disasters such as resource scarcity, drought, and flood on agricultural production and food systems are detailed to argue how countries specify strategies and policies at the national level. In addition, their contributions to global GHG emissions and environmental destruction also will be mentioned. Finally, by referring to the current crises, COVID-19 and the Russia-Ukraine crisis, the difficulties of these global crises in ensuring food security at the national level are underlined.

4.2. Food Security Policies of the United States of America

Food and agriculture policies are the actions taken by national governments by making laws, regulations, and decisions by various institutions that affect the production, distribution, processing, and consumption of food. More specifically, food policy leads to decisions and actions at the international and national levels. These are highlighted as layers because they are intertwined with other policies of countries, such as economy, environment, and politics²⁶⁵. In the steps to be taken by governments in their national and international policies, the relationship between these layers of food policies in various fields remains crucial. These layers include various areas such as the export/import activities of countries, the prevention of poverty and hunger, and the availability of nutritious food in a healthy environment by putting food and agriculture at the center. It is observed that these layers vary from country to country and that various policies and decisions are made in different fields²⁶⁶. Moreover, the socio-economic conditions, agricultural production and capacities, and response to food

²⁶⁵ Parke Wilde, "Making Food Policy in the United States," in *Food Policy in the United States* (ROUTLEDGE in association with GSE Research, 2013), pp. 1-16.

²⁶⁶ Ibid. p.3

crises of the countries contain vital information about the extent to which food policies can differ. From this perspective, there are quite comprehensive and multi-dimensional factors such as meeting the demand for food within the country, trade activities, sustainability of agricultural productivity, resources and production, and adaptation to climate change by minimizing the destruction of natural resources²⁶⁷. Additionally, it needs to be highlighted how quickly food policies can respond to several factors that may develop and how sustainable they are. It becomes significant how pandemics, war and conflict situations, changing climate conditions, and trade barriers affect food policies and how countries respond with their policies to these challenges.

Supply and demand for agricultural and food production are increasing day by day²⁶⁸. It has become an essential element of national agricultural and food policies. These policies also reveal differences in various aspects between developing and developed countries. In this respect, it is important to examine the agricultural and food policies of the United States of America. The USA is one of the largest economies in the world and one of the third largest in terms of population²⁶⁹. Cultivated areas within a total of 2.3 billion decares of land make up "17%"²⁷⁰. The US has a large amount of cultivated land and employment power in this area. In this way, agriculture allows the formation of a large market in the US economy. However, it is noteworthy that its share is low when compared with other sectors such as industrial production. Agriculture and food sectors were in the "5% of US GDP" in 2020²⁷¹. This still contributes \$1.055 trillion

²⁷⁰ Ibid.

²⁶⁷ OECD, "Innovation, Agricultural Productivity and Sustainability in the United States" (Paris: OECD Publishing, 2016).

²⁶⁸ Ibid.

²⁶⁹ Daniel P. Bigelow and Allison Borchers, "*Major Uses of Land in the United States, 2012*" (Washington, D.C.: United States, Dept. of Agriculture, *Economic Research Service*, 2017).

²⁷¹ United States Department of Agriculture, "Ag and Food Statistics: Charting the Essential, February 2020". (Washington, D.C.: United States, Dept. of Agriculture, *Economic Research Service*, 2020)

and covers 10.3% of the total employment²⁷². Moreover, The US is one of the largest agricultural exporters, although the agricultural sector makes up a small portion of the economy compared to other sectors. The US exports cereal products, corn, wheat, soybean, cotton, and various vegetables and fruits²⁷³. Its food and agriculture system contributes to the interconnection of not only global but also regional, national, and local markets.

In addition to its large economy, the USA is a pioneering country in ensuring the availability of food and ensuring access to food at national and household levels. According to the Household Food Security report, "89.5% of US households" have reached food security in 2020²⁷⁴. This report draws attention to the fact that this household has access to adequate and nutritious food as well. In the remaining 10%, it is seen that food security cannot be provided because one or more people in the households are malnourished, cannot find available food, or cannot access food economically²⁷⁵. Moreover, it is stressed that the number of people who have food security due to COVID-19 may more than double²⁷⁶. Especially, disadvantaged groups living in the USA will be more affected, such as Black and Latino households. To reduce food security, the USDA (United States Department of Agriculture) has created programs that include various aids and payments for both producers and households with national policies. For example, an income payment of more than \$20 billion to farmers was achieved²⁷⁷. Since the food-related sectors such as hotels and restaurants

²⁷² United States Department of Agriculture, "Fiscal Year 2023 Budget Summary" 2022.

²⁷³ United States Department of Agriculture, "Ag and Food Statistics: Charting the Essential, February 2020". (Washington, D.C.: United States, Dept. of Agriculture, *Economic Research Service*, 2020)

²⁷⁴ Alisha Coleman-Jensen et al., "Household Food Security in the United States in 2020" (Economic Research Service, USDA, 2021), pp. 1-55.

²⁷⁵ Ibid.

²⁷⁶ Center for Agriculture and Food Systems, and Food Law and Policy Clinic, "The Urgent Call for a U.S. National Food Strategy", 2020, pp. 1-59

²⁷⁷ Ibid.

were affected by COVID-19, additional assistance was provided to the employees there. Thus, it is aimed to reduce and eliminate the effects of COVID-19 on access and availability of food²⁷⁸. Furthermore, USDA tried to carry on the support for both consumers and producers that were affected by market disruptions of COVID-19. It introduced several programs on crop insurance, commodity and food distribution, and monetary aid. For instance, USDA authorized States to increase monetary aid, and an additional 500 million dollars was provided to the WIC program known as "The Special Supplemental Nutrition Program for Women, Infants, and Children"²⁷⁹. Additionally, although the US food system provides a low-cost food supply, some groups and regions of the population still face difficulties in accessing food. Even with low costs, the financial access of these groups can be limited. On the contrary, problems such as excessive consumption, excessive food loss, and obesity in the country also indirectly pose risks to food security²⁸⁰. For instance, the widespread preference for the developed food chain such as fast-food restaurants throughout the country and even globally creates a problem such as unhealthy nutrition while reaching cheap food. The US emphasizes healthy eating and access to nutritious food in its national goals, but market forces and marketing techniques allow for more extensive advertising of these fast-food foods. Hence, it creates food safety problems as well.

Furthermore, Wilde covers that the food and agricultural policies of the USA are shaped under six titles²⁸¹. These policies have been shaped by adding them from year to year since the 1930s, and strategies have been designed to eliminate existing

²⁷⁸ United States Department of Agriculture, "Agricultural Projections to 2031", (Washington, D.C.: United States, Dept. of Agriculture, *Office of the Chief Economist*, 2022).

²⁷⁹ OECD, "Agricultural Policy Monitoring and Evaluation 2021: Addressing the Challenges Facing Food Systems", (Paris: OECD Publishing, 2021), pp. 561-580.

²⁸⁰ Center for Agriculture and Food Systems, and Food Law and Policy Clinic, "The Urgent Call for a U.S. National Food Strategy", 2020, pp. 1-59

²⁸¹ Parke Wilde, "Making Food Policy in the United States," in *Food Policy in the United States* (ROUTLEDGE in association with GSE Research, 2013), pp.17-35.

problems. Although the policies have been subject to criticism from environmental groups and large farm owners from time to time, there are elements for shaping the national policies on food security. These policies cover price support, supply control, deficiency payment to farmers, direct payments, crop insurance, and demand expansion programs by the USDA under the government. Starting from the 1930s, the USDA played a significant role until the 1970s, aiming to provide aid to producer farmers and the agricultural sector²⁸². However, The USDA had put some production quotas to avoid overproduction and decided on national production amounts for major crops as well. Besides, it prepared the payment to producers when the target price would be higher than the market price. Between 2008 and 2011, the USDA increase billions of dollars to help farmers and producers²⁸³. Moreover, crop insurance was one of the important policy tools because it targets to protect farmers' crop yields and production from economic and environmental risks. This insurance can be paid by farmers' amount of crop loss or expected income.

According to Naylor, during the 1930s, agricultural support was used to stop farmers who dropped their job after Great Depression²⁸⁴. In that regard, new policies had begun to release, and new laws had passed in the agricultural areas, such as Farm Bill and Food and Agricultural Acts²⁸⁵. The main goal is to achieve improvements and innovations on a wide range of issues in agriculture and food. Laws have been made on a wide variety of issues, from the spread of modern agriculture to the access of students to nutritious meals at school, from the prevention of agricultural land loss to trade quotas. The Farm Bill opens the door to high aid, especially for improvements in

²⁸² Ibid. p.29

²⁸³ Ibid. p.30

²⁸⁴ Rosamond L. Naylor et al., "Institutions, Interests, and Incentives in American Food and Agriculture Policy," in *The Evolving Sphere of Food Security* (Oxford: Oxford University Press, 2014), pp. 87-122.

²⁸⁵ USDA, "Provisions of the Federal Agriculture Improvement and Reform Act of 1996" (Washington, D.C.: U.S. Dept. of Agriculture, Economic Research Service, 1996), 128-139.

agriculture. Accordingly, it is underlined that the Farm Bill, which entered into force in 2018, will cost 428 billion dollars in a five-year period, which will cost 1.8 billion dollars more than the previous one²⁸⁶. The Farm Bill gives particular importance to spending on four main topics; nutrition, commodity support, protection, and crop insurance. Moreover, expenditures may vary according to the annual situation and priority areas. For instance, with the global food crisis of 2007-2008, more attention was paid to spending on conservation programs and nutritional aid²⁸⁷. One of the first steps is to determine the expenditures and costs by observing the conditions at both global and national levels. During COVID-19, the US government immediately introduced programs that cover COVID-related issues. Especially, USDA launched programs to assist in the food and agricultural areas that were affected by the pandemic. Considering the global situation, the US position in the global food market and its food aid make it an important player. It should be emphasized that it can affect food prices and stability with its wide range of products in the global food market²⁸⁸. In terms of environmental factors, the US food system is one of the major developed countries to release climate change influencing GHG, as well as being exposed to the effects of climate change. It should be emphasized that the US food system consumes a lot of energy from transportation to manufacturing, and fossil fuel consumption is also high-levels²⁸⁹. In this respect, reducing carbon emissions both in agricultural production and in the food system, adaptation to climate change, and mitigation policies become prominent²⁹⁰. Hence, the USDA often promotes climate-sensitive

²⁸⁶ Renée Johnson and Jim Monke, "What Is the Farm Bill?", *Congressional Research Service*, 2018.

²⁸⁷ Rosamond L. Naylor et al., "Institutions, Interests, and Incentives in American Food and Agriculture Policy," in *The Evolving Sphere of Food Security* (Oxford: Oxford University Press, 2014), p.107

²⁸⁸ Ibid.

²⁸⁹ OECD, "Innovation, Agricultural Productivity and Sustainability in the United States" (Paris: OECD Publishing, 2016).

²⁹⁰ USAID, "U.S. Government Global Food Security Strategy: Fiscal Year 2022-2026", *Feed the Future*, 2016.

targets and strategies that include climate change response²⁹¹. Thus, it tries to reduce the effects of climate change by reducing global carbon emissions as well as providing a global food supply through the achievement of sustainable and stable agricultural production. Specifically, hurricanes and droughts with increasing frequency in the Southeast and Southwest regions of the US cause crop losses, while irrigation change causes inefficiency in crops. For example, irrigated agriculture is important to the US economy and agricultural production because it uses more than "80% of freshwater²⁹²." This can be affected by climate change as well as stressing the water resources. The increasing water demand for irrigated agriculture combined with the effects of climate change in the region turn into the main cause of stress on water resources. For this reason, it is possible to take local or regional drought-resistant measures and prevent inefficient and excessive use of water resources by increasing technological developments and climate-oriented policies²⁹³. The US National Adaptation Plan emphasizes more sustainable and responsive agricultural production and food systems that are under the threat of climate change, including partner countries²⁹⁴. It shows that land and water resources should be determined as a priority without polluting or destroying natural resources. Moreover, improvements should be made in all areas of food systems by offering quick solutions for the effects of climate change. The Biden administration also emphasizes the importance of combating climate change and its effects on the country. Members of Congress also greatly support climate-oriented agriculture and food policies. It is noteworthy that these

²⁹¹ Ibid. p.6

²⁹² Daniel Hellerstein, Dennis Vilorio, and Marc Ribaudo, eds., "Agricultural Resources and Environmental Indicators" (Washington, DC: U.S. Dept. of Agriculture, Economic Research Service, 2019).

²⁹³ Ibid. pp. 51-52

²⁹⁴U.S. Environmental Protection Agency, "Climate Adaptation Action Plan" (Washington, D.C.: U.S. Environmental Protection Agency, 2021).

policies apply to subsidize farmers and producers so that they prefer carbon reduction and climate-adaptive practices without additional or high taxation²⁹⁵.

Finally, the war between Ukraine and Russia may have significant effects on the United States. First, the embargoes applied to Russia also affect the global oil prices. Considering the USA's need and excessive dependence on fossil fuels, an increase in prices may affect the USA energy market²⁹⁶. Although there is not as a direct dependency as Europe, the USA can be affected by global petroleum prices. Secondly, it is predicted that both countries will affect the prices in the global food market. On the other hand, although a short-term gain will be made by supplying the production of several crops and grains such as corn, wheat, and oilseeds in the USA, it will not be a definitive solution. Moreover, considering the share of the USA in the global area, the volatility in prices and the pauses in the food supply may cause the USA to face food security risks. Thus, the Biden administration put forward decisions with USDA and USAID (US Agency for International Development) aimed at accelerating agricultural production, reducing export prices of fertilizers, and increasing food aid²⁹⁷. This includes making 670 million dollars of food aid to Ukraine. Thus, the USA will both provide humanitarian aid and help balance the gap in food production.

²⁹⁵ Joseph Glauber and Vince Smith, "Trends in US Agricultural Policy since 2000 and Implications for the next Twenty Years," *EuroChoices* 20, no. 2 (2021): pp. 58-63.

²⁹⁶ Ruth Endam Mbah and Divine Wasum, "Russian-Ukraine 2022 War: A Review of the Economic Impact of Russian-Ukraine Crisis on the USA, UK, Canada, and Europe," *Advances in Social Sciences Research Journal* 9, no. 3 (2022): pp. 144-153.

²⁹⁷ Joseph W. Glauber and Vincent H. Smith, "How Best (Not) to Address the Ukraine Crisis," *The American Enterprise Institute*, 2022.

4.3. Food Security Policies of China

In the Chinese context, food and agricultural policies become significant to achieve several challenges, such as meeting the demand of the rising population, increasing agricultural production capacity, and reducing water scarcity. Considering that China's population will exceed 1.4 billion in 2025, agricultural production capacity will deeply affect the connection between food supply and demand in both national and international markets²⁹⁸. China is one of the key players with its agricultural production and its imports for self-sufficiency and exports for supplying various agricultural and food products. In this respect, China's food security policies and its power struggle in the global food supply need to be highlighted.

As a country with the largest population in the developing world, China's basic food policy has emerged as self-sufficiency. According to Ghose, China's "food security" means "grain security."²⁹⁹ China especially emphasized 95% grain self-sufficiency in recent years³⁰⁰. In this respect, it is seen that China's policies are primarily aimed at ensuring the safety and security of grain products. Furthermore, China has 9% of the world's arable land and 8% of freshwater resources. It produces "18% of cereal grains and supplies 50% of vegetables" in both the domestic and global markets with its limited land and water resources³⁰¹. Thus, China is not only the world's largest producer of food but also one of the largest consumers. For example, it imported 120

²⁹⁸ Hon-Ming Lam et al., "Food Supply and Food Safety Issues in China," *The Lancet* 381, no. 9882 (2013): pp. 2044-2053.

²⁹⁹ Jing Zhu and Funing Zhong, "Food Security in China from a Global Perspective," *Agricultural & Applied Economics Association* 32, no. 2 (2017). p.3

³⁰⁰ Ibid. p.3

³⁰¹ Bishwajit Ghose, "Food Security and Food Self-Sufficiency in China: From Past to 2050," *Food and Energy Security* 3, no. 2 (2014): pp. 86-95

million tons of grain annually³⁰². Moreover, China's food and agricultural policies could easily affect most markets in the world. It has become a major global partner, especially with its accession to the WTO in 2001, and has increased its agricultural production capacity and influenced national and global markets.

Historically, China's largest industry has been agriculture and has contributed to rural development and prosperity, contributing to economic recovery. While the gross income of the agricultural sector was 71 billion dollars in 1961, this number increased to 594 billion dollars in 2006³⁰³. This scale of growth has made China one of the countries with the largest agricultural sector in the world in 2012³⁰⁴. This shows that "28% of global agricultural production" originates from China. Furthermore, in addition to the rapid increase in population, industrialization, and urbanization in China, the country's annual food and agricultural self-sufficiency was 100% during the 1960s and 1990s³⁰⁵. The desire for food and agricultural self-sufficiency has been emphasized as a historically rooted phenomenon in China. The food security of China, which has been dealing with famine and hunger problems throughout history, was shaped by this mentality³⁰⁶. Famines continued to be a major problem as death rates exceeded birth rates. Thus, starting from the 1970s, China prioritized the acceleration of rural development, modernization, and industrialization process to prevent famine

³⁰² Jing Zhu and Funing Zhong, "Food Security in China from a Global Perspective," *Agricultural & Applied Economics Association* 32, no. 2 (2017) p.1

³⁰³ Du Yuneng et al., "Can China's Food Production Capability Meet Her Peak Food Demand in the Future?" *International Food and Agribusiness Management Review* 23, no. 1 (2020): pp. 1-17.

³⁰⁴ Ibid.

³⁰⁵ Hongzhou Zhang, "China's Food Security Strategy Reform: An Emerging Global Agricultural Policy," in *China's Global Quest for Resources: Energy, Food and Water*, ed. Guoqiang Cheng (Routledge, 2017), pp. 23-42.

³⁰⁶ Ibid.

and poverty³⁰⁷. Before 1978, the government saw the reduction of agricultural prices as the main target and aimed at achieving rural development. The Chinese government, which was a monopoly, had a wide range of controls from grain production to marketing, from determining food prices to purchasing grains. However, in 1978 the Chinese economy was in the worst situation, and the poverty level increased considerably. More than 30% of the 800 million rural population was suffering from poverty³⁰⁸. For this reason, economic reform was aimed at recovering the collapsed economy and poverty while enhancing rural development. Thus, China began to take place in the market economy³⁰⁹. The economic reform has contributed to the emphasis on grain production and the restructuring of the sector, thereby providing a driving force for increased production and productivity³¹⁰. The adaption of the rapid economic growth model led to the policy of promoting and increasing agricultural production to ensure food security³¹¹. In the 1980s, 10% of the government's budget corresponded to spending on food marketing subsidies³¹². With the economic growth experienced in this period, there were also increases in income and consumption. The economic growth and developments in agricultural production together helped China to reduce its grain imports in the late 1980s. It led China to become an exporter of various grain groups in the 1990s. By following the positive developments, the Chinese government

³¹² Ibid.

³⁰⁷ Hon-Ming Lam et al., "Food Supply and Food Safety Issues in China," *The Lancet* 381, no. 9882 (2013): pp. 2044-2053.

³⁰⁸ Hongzhou Zhang, "China's Food Security Strategy Reform: An Emerging Global Agricultural Policy," in *China's Global Quest for Resources: Energy, Food and Water*, ed. Guoqiang Cheng (Routledge, 2017), pp. 23-42

³⁰⁹ Jian Li and Jean-Paul Chavas, "How Have China's Agricultural Price Support Policies Affected Market Prices? A Quantile Regression Evaluation", (Vancouver: International Association of Agricultural Economists, 2018) p.5

³¹⁰ Bishwajit Ghose, "Food Security and Food Self-Sufficiency in China: From Past to 2050," *Food and Energy Security* 3, no. 2 (2014): pp. 86-95,

³¹¹ Jing Zhu and Funing Zhong, "Food Security in China from a Global Perspective," *Agricultural & Applied Economics Association* 32, no. 2 (2017): pp. 1-5.

has started to eliminate the restrictions and interventions on agricultural products and trade over time. It has tried to adapt to the global markets by not getting involved in the pricing of agricultural products. In the following process, encouragement and support programs for agricultural production were also made, and steps were taken to ensure stability in production and food prices³¹³. Importantly, this progress in the 1990s and its participation in the WTO in 2001 raised two aspects of concern³¹⁴. The first was that China could affect the availability of food by importing too much from global markets to feed the population, and China would face great difficulties in global markets and fall back. Neither of these happened, and even in the 2000s, China was a major exporting country, contributing global food market. On the other hand, the selfsufficiency rate decreased to 95%³¹⁵. According to a study, poverty and food security are very risky levels in 592 regions of China³¹⁶. It points out that there are provinces, counties, and autonomous regions within these regions: Yunnan with seventy-three counties, Guizhou with fifty counties, etc. People in these counties and regions are highly vulnerable to food security and comprise 7.3% of China's total population³¹⁷. In this respect, reaching the fragile population in rural areas has become an important part of China's grain self-sufficiency program. Thus, the Chinese government began to publish "No 1 Central Document" reports, which contain national policies to minimize the differences between rural and urban areas³¹⁸. These reports are published

³¹⁷ Ibid

³¹³ Jian Li and Jean-Paul Chavas, "How Have China s Agricultural Price Support Policies Affected Market Prices?: A Quantile Regression Evaluation", (Vancouver: International Association of Agricultural Economists, 2018)

³¹⁴ Jikun Huang and Guolei Yang, "Understanding Recent Challenges and New Food Policy in China," *Global Food Security* 12 (2017): pp. 119-126.

³¹⁵ Ibid. p.6

³¹⁶ Nie Fengying, Bi Jieying, and Zhang Xuebiao, "Study on China's Food Security Status," *Agriculture and Agricultural Science Procedia* 1 (2010): pp. 301-310.

³¹⁸ OECD, "Agricultural Policy Monitoring and Evaluation 2021: Addressing the Challenges Facing Food Systems", (Paris: OECD Publishing, 2021) pp. 193-214

annually and consist of policies shaped on farmers, agriculture, and rural areas. Especially in the 2000s, subsidizing agriculture by reducing or abolishing taxation has made China the largest agricultural subsidy country³¹⁹. Market support prices have increased, which is reflected in the increase in rural farmers' incomes. However, it was not at the same rate as in urban areas. Supporting prices is also notable for its strengthening of food security since 2008³²⁰. In this period of the global food crisis, both the stocks and support prices made by China prevented the increase in grain prices in the country. In this way, support prices continued to increase gradually in China between 2009 and 2014, while global food prices were experiencing volatility³²¹. The rising support price has been a major driving force for farmers to increase their production. Globally, this policy in China has been a major step in promoting lowpriced imports³²². It should be underlined that this support program of China affects different product groups in several ways. For instance, while rice prices stabilize in the local market, maize prices fluctuate without stabilizing³²³. Furthermore, China has faced a trade war with the United States by implementing quotas and counterretaliatory duties on both goods and agricultural exports reciprocally. These problems escalated over time, and exports fell to low levels. However, China, in turn, began to establish commercial relations with other countries. By importing soybeans from Brazil, China imported \$28.8 billion in 2018, which has been particularly important

³¹⁹ Ibid.

³²⁰ Jiarong Qian, Shoichi Ito, and Zhijun Zhao, "The Effect of Price Support Policies on Food Security and Farmers' Income in China," *Australian Journal of Agricultural and Resource Economics* 64, no. 4 (2020): pp. 1328-1349

³²¹ Ibid.

³²² Mina Hejazi and Mary Marchant, "China's Evolving Agricultural Support Policies," *Agricultural & Applied Economics Association* 32, no. 2 (2017).

³²³ Jian Li and Jean-Paul Chavas, "How Have China s Agricultural Price Support Policies Affected Market Prices?: A Quantile Regression Evaluation", (Vancouver: International Association of Agricultural Economists, 2018)

for the Brazilian economy³²⁴. This resulted in the US soybean exports to China, creating a commercial loss of one billion dollars in 2019. In 2020, they signed a new agreement to normalize trade and economic issues. China has committed to importing agricultural goods worth 36 billion dollars to the US market³²⁵. China also keeps furthering its economic relations with other countries as well by signing win-win agreements.

In environmental terms, China struggles with pressures on land and water resources that cause a decrease in productivity and negative effects on production. The question of "how China can feed such a population" is frequently raised due to several reasons. Problems such as limited arable land and water scarcity are increasingly under stress due to adverse weather conditions with the effects of climate change³²⁶. According to Han and Chang, China has a 33% share of global GHG emissions and emits 11.9 billion tons of CO2 emissions³²⁷. This puts China first among other countries. One of the biggest reasons is a country's dependence on fossil fuels. On the other hand, China aims to be carbon neutral and switch to clean energy by 2060 by making various commitments. A clear emission reduction target for the agricultural sector is to reduce pesticides, reduce GHG from land use, and commit to climate-smart technology³²⁸. Furthermore, it draws attention to increasing productivity by extending the arable land, which includes the development goals in the rural areas of China and protecting the existing arable land. However, only 12% is used for agricultural activities. It is argued

³²⁴ China Power Team. "How is China Feeding its Population of 1.4 billion?" China Power. January 25, 2017. Updated August 26, 2020. <u>https://chinapower.csis.org/china-food-security/</u> (accessed on May 25, 2022)

³²⁵ Joseph W. Glauber, "China's Accession to the WTO and Its Impact on Global Agricultural Trade," *IFPRI*, 2021, pp. 1-33

³²⁶ Wenli Qiang et al., "Evolution of the Global Agricultural Trade Network and Policy Implications for China," *Sustainability* 12, no. 1 (2019).

³²⁷ Jin Han and Hongmei Chang, "Development and Opportunities of Clean Energy in China," *Applied Sciences* 12, no. 9 (September 2022)

³²⁸ Ibid.

that rapidly increasing urbanization and population will cause a decrease in arable areas³²⁹. The Chinese government also invests heavily in overseas territories by leasing or buying land for production. Thus, these investments of China both try to meet the food demand and help the continuity of the fertility of the land in its country. It should be noted that between 2000 and 2018, China purchased 3.2 million hectares of land³³⁰.

Additionally, over-spraying and misuse in agricultural production pose a major food safety issue in China and its trade partners. According to Lam et al., China is the largest pesticide producing and exporting country³³¹. Specifically, fertilizers used in agricultural production between 1978 - 2013 increased seven times. In 2013, China used more than three times in world usage, creating a very global environmental, health and food safety problem³³². Although using chemical fertilizers and pesticides has doubled the crop yield, excessive or incorrect use causes GHG increase and deterioration by increasing the acidity of the soil³³³. Likewise, the mixing of chemicals into clean water and the contamination of water resources is also becoming one of China's major problems. China needs extensive irrigation to achieve agricultural production. In addition to the demand for water in cultivated lands, both underground water and irrigation methods are significant. On the other hand, the effects of climate change put stress on these resources³³⁴. For example, while southern China is rich in

³²⁹ Bishwajit Ghose, "Food Security and Food Self-Sufficiency in China: From Past to 2050," *Food and Energy Security* 3, no. 2 (2014): pp. 86-95

³³⁰ Brooke Jardine, "Food Security in China: Challenges, Policies, and Projections," *Journal of Chinese Politics, National Security, and Foreign Affairs*, 2021, pp. 83-94.

³³¹ Hon-Ming Lam et al., "Food Supply and Food Safety Issues in China," *The Lancet* 381, no. 9882 (2013): pp. 2044-2053

³³² Mina Hejazi and Mary Marchant, "China's Evolving Agricultural Support Policies," *Agricultural & Applied Economics Association* 32, no. 2 2017

³³³ Brooke Jardine, "Food Security in China: Challenges, Policies, and Projections," *Journal of Chinese Politics, National Security, and Foreign Affairs*, 2021, pp. 83-94.

³³⁴ Jikun Huang and Guolei Yang, "Understanding Recent Challenges and New Food Policy in China," *Global Food Security* 12 (2017): pp. 119-126.

freshwater resources, many regions in northern China will face severe water scarcity in the coming years³³⁵, which will affect agricultural production and food security. Thus, China has started to take important steps by investing in sustainable and climatesmart technologies to minimize environmental degradation of agriculture and water resources. These investments range from making the most efficient irrigation and arable land to improving rural infrastructure. It is aimed to integrate the small producer and the land into the markets with the R&D studies conducted in rural areas. It helps to increase the productivity of low and medium-sized agricultural lands by preventing soil degradation and controlling water resources³³⁶. South-North Water Diversion Project is being constructed to carry water to the arid regions of China and to ensure efficiency in agricultural production. This project predicts that forty-five billion m³ of water will be transported and the regions experiencing water scarcity will decrease³³⁷. Moreover, various programs such as rainfall harvesting, drip irrigation, and water quality improvement are conducted in various regions. Chinese government extensively emphasizes the most efficient use of agricultural land and water resources in food systems³³⁸. In terms of land use, it is primarily aimed at protecting the existing arable lands to achieve sustainable agricultural activities and reduce carbon emissions by reducing chemical fertilizers and pesticides in these areas. In addition, China sheds light on increasing investments and studies in biotechnology as elimination of chemical fertilizers and pesticides. According to Donnellon-May's article, Chinese biotech companies announced that two new GMO corn varieties could be imported in January 2022³³⁹. However, GMO products are largely rejected by the public.

³³⁵ Bishwajit Ghose, "Food Security and Food Self-Sufficiency in China: From Past to 2050," *Food and Energy Security* 3, no. 2 (2014): pp. 86-95

³³⁶ Huang and Yang, "Understanding Recent Challenges and New Food Policy in China," p.122

³³⁷ Hon-Ming Lam et al., "Food Supply and Food Safety Issues in China," *The Lancet* 381, no. 9882 (2013): pp. 2044-2053.

³³⁸ Yuelai Lu, ed., "China Agri-Food News Digest: Jan – Feb 2022 (Total No 105)," SAIN, UK-China Sustainable Agriculture Innovation Network, 2022.

³³⁹ Genevieve Donnellon-May, "China's Focus on Food Security," *The Diplomat*, 2022.

Additionally, the COVID-19 disease, which was identified in 2019 in Wuhan, China, had a global impact and major challanges on food systems, especially in China. It has followed strict quarantine rules to prevent the spread in the region. However, it is seen that food and financial aid are provided in order not to disrupt the food supply chain³⁴⁰. After a couple of strict policies, China has managed to return to normal life from quarantine. Thanks to the low level of volatility in food prices, there has not been a major food crisis in the country. However, the global economic recession, the decline in Chinese export demand, and logistics disruptions led to a shrinkage in China's economy in the first quarter of 2020³⁴¹. However, that did not last long, and China became the only country to grow economically in late 2020³⁴².

Furthermore, while COVID-19 had different effects on various countries within the global food system, the Russia-Ukraine crisis that emerged in the first quarter of 2022 will also affect China. In particular, the pressures of both countries on global food supply are increasing and growing clearly. Even if countries such as China or the USA try to close this gap by increasing their own production, they may not be enough to overcome the crisis. Nevertheless, floods in China and drought in the US also create very fundamental challenges. On the other hand, China is the main importer of maize and oilseeds from Ukraine, and there will be delays in these products as the Russia-Ukraine war continues. China meets almost 30% of its corn import from Ukraine³⁴³. Declines in Ukraine's agricultural production may affect the prices of global corn and

³⁴⁰ Xiaohua Yu et al., "The Impact of Covid-19 on Food Prices in China: Evidence of Four Major Food Products from Beijing, Shandong and Hubei Provinces," *China Agricultural Economic Review* 12, no. 3 (2020): pp. 445-458

³⁴¹ Ibid.

³⁴² Zohal Habibi, Hamed Habibi, and Mohammad Aqa Mohammadi, "The Potential Impact of Covid-19 on the Chinese GDP, Trade, and Economy," *Economies* 73 10, no. 4 (2022): pp.1-16

³⁴³ World Bank, "The Impact of the War in Ukraine on Global Trade and Investment," 2022, <u>https://doi.org/10.1596/37359</u>.

other product groups, as well as put pressure on China³⁴⁴. Additionally, 70% of global corn stocks are in China³⁴⁵. Although it is not known when the end of the war will be, this will enable corn supply to be made and food prices to be kept under pressure for a while. Finally, Chinese President Xi Jinping emphasized the continuation of production to ensure global and national food security³⁴⁶.

4.4. Food Security Policies of Egypt

Egypt, as a lower-middle-income country, is placed in the Middle East and North Africa, also known as MENA Region, with more than 102 million population, making it the most populous in the region³⁴⁷. Egypt has been challenged with problems that affect the country's food security and national policies toward food and agriculture. Rising poverty parallel with population, undernourishment, rising food prices, water - land scarcity under climate change impact, and lastly, global conflicts such as war and pandemics become key issues on Egypt's national agenda. It has a more dominant public sector under a strong network of State support itself. Furthermore, both areas of economics and politics have been highly intertwined for decades under the influence of rulers and people in business who are closely related to them³⁴⁸. Also, this is reflected in the country's food and agriculture policy. Agriculture has a crucial place

³⁴⁴ Angèle Poirier, Ted Bilyea, and Al Mussell, "Food Security in the Wake of the Ukrainian Crisis: How Canada Can Play a Role," *The Canadian Agri-Food Policy Institute*, 2022.

³⁴⁵ Ibid. p.13

³⁴⁶ Genevieve Donnellon-May and Paul Teng, "Asia's Food Security in Trouble?," *RSIS Commentary*, 2022.

³⁴⁷ WFP, "Evaluation of Egypt WFP Country Strategic Plan (2018-2023)", (Rome: World Food Programme, 2021) 1-68

³⁴⁸ Giulia Soffiantini, "Food Insecurity and Political Instability during the Arab Spring," *Global Food Security* 26 (2020)
in the Egyptian economy. It has already been playing an important sector in Egypt's GDP and reducing poverty and food insecurity. The agricultural sector is the livelihood of 57% of the Egyptian population and directly employs 26% of the total workforce³⁴⁹. On the other hand, in Upper Egypt, which is one of the two divisions within Egypt, the level of extreme poverty affects more than 70% of the population³⁵⁰. The poverty level here is extremely low, and a large part of the population is food insecure. For this reason, Egypt both aims to increase its investments in agriculture and shape its national programs that include government support to reduce these poverty levels over the years. Accordingly, Egypt increases financial aid and investments to ensure food security and increase agricultural production. The bread subsidy program, which covers seventy million of the Egyptian population, remains the most important policy tool. However, according to FAO, 5.4% of the Egyptian population is highly malnourished, and 27% is also food insecure at moderate levels³⁵¹. Especially effect of climate change on the temperatures can create crop and water stress in the MENA Region. It should also be emphasized that in 2040 the region is expected to increase its temperature by 2°C³⁵². This increase will affect the availability and accessibility of food, as well as food utilization problems such as malnutrition in households currently living in poverty³⁵³. According to Ramadan, approximately 27% of Egyptian households have great difficulties in accessing basic food products³⁵⁴. In these conditions, as the increasing temperatures can reduce the efficiency of food

³⁴⁹ WFP, "Evaluation of Egypt WFP Country Strategic Plan (2018-2023)", (Rome: World Food Programme, 2021) p.3

³⁵⁰ Ibid. p.3

³⁵¹ Ibid. p3

³⁵² Clémentine Lienard, "MENA Climate Week 2022: Tackling Climate Change in MENA by Improving Regional Cooperation" *Rethinking Security in the 2020s Series*, (Brussels: Brussels International Center, 2022) p.2

³⁵³ WFP, "Evaluation of Egypt WFP Country Strategic Plan (2018-2023)", (Rome: World Food Programme, 2021)

³⁵⁴ Racha Ramadan, "Determinants of Food Security in Egypt", 2017.

production, access to food and food availability will inevitably affect Egypt's policies together with the volatility in global food prices.

Historically, food subsidy, Egypt's most important food policy, has been shaped by the conditions of changing periods. It should not be overlooked that this policy is highly influenced by political, economic, and social conditions and is an integral element³⁵⁵. In the early days of the program, it started with the distribution of basic foods such as sugar, cooking oil, and tea throughout the country. Moreover, Arab Socialism policies began to rise under the Nasser administration and transformed the reduction of the rural-urban gap, focusing on fairer income distribution and equal distribution of food at affordable prices between rural and urban³⁵⁶. The Nasser administration aimed to increase the access of all Egyptian people to food by allocating an additional budget to food subsidies. This system continued to expand in the following administration. Under Sadat's administration, food subsidies in Egypt grew, and more food products were included in the system. The budget allocated by the state for this policy has increased significantly. In particular, Baladi bread, the local bread of Egypt, was one of the most consumed and subsidized food products by Egyptians. Hence, the government expenditures for the subsidy and the supply of wheat used in making Baladi bread had increased considerably. However, this increase was followed by a reduction in subsidies in line with the recommendations received from the IMF and the World Bank in the late 1970s. In 1977, popular uprisings known as the Bread Intifada started and turned into violent actions³⁵⁷. As a result of these mass uprisings, the government announced that the reduction in subsidies would be lifted, and the situation was reversed. In the 1980s, food subsidies continued to increase

³⁵⁵ Ahmed Farouk Ghoneim, "The Political Economy of Food Price Policy in Egypt," *Food Price Policy in an Era of Market Instability*, 2014, pp. 253-274

³⁵⁶Yumna Kassim et. al, "An agricultural policy review of Egypt: First steps towards a new strategy" (Washington, DC and Cairo, Egypt: International Food Policy Research Institute (IFPRI), 2018)

³⁵⁷ Giulia Soffiantini, "Food Insecurity and Political Instability during the Arab Spring," *Global Food Security* 26 (2020)

exponentially. Compared to the previous decade, the government's expenditure on food subsidies reached 14%. During this period, it was aimed to continue food subsidies and to reduce government expenditures partially with new policies. For example, the ration card system is divided into two different forms, fully and partially, and fewer commodity products are included in the partial ration card system³⁵⁸. In addition, from the late 1960s to the early 1990s, the agricultural sector was a key sector³⁵⁹. In this period, besides food subsidies, crop rotation programs and agricultural loan programs increased their importance. Subsidies were also increased to extend to agricultural inputs, and access to producers in rural areas was achieved. However, after the 1990s, the role of the government began to decrease gradually, and Egypt began to turn into a country that gradually liberalized, integrated into global markets, and developed the private sector. During this period, tariffs on food products were reduced, and commercial agreements were made with various countries, especially the USA, EU, and Arab countries. However, in the 1990s, it was seen that the budget allocated to food subsidies exceeded 21%³⁶⁰. In the 2000s, this situation gradually changed. Its increased expenditures have been tried to be reduced slowly to avoid social tensions and negativities. Thus, expenditures allocated to food subsidies were reduced to 4% in 2007³⁶¹. On the other hand, the 2007-2008 global food crisis and the increase in food prices created a major problem for Egypt. For instance, the 37% increase in the price of bread caused major protests in 2008 and paved the way for a regime change³⁶².

³⁵⁸ Ahmed Farouk Ghoneim, "The Political Economy of Food Price Policy in Egypt" *Food Price Policy in an Era of Market Instability*, 2014, pp. 253-274

³⁵⁹ Ibrahim Soliman, Jacinto Fabiosa, and Halah Bassiony, "A Review of Agricultural Policy Evolution, Agricultural Data Sources, and Food Supply and Demand Studies in Egypt," *Center for Agricultural and Rural Development*, 2010.

³⁶⁰ Assem Abu Hatab and Sebastian Hess, "'Feed the Mouth, the Eye Ashamed': Have Food Prices Triggered Social Unrest in Egypt?" 2021.

³⁶¹ Ibid. p.5

³⁶² Giulia Soffiantini, "Food Insecurity and Political Instability during the Arab Spring," *Global Food Security* 26 (2020)

While Egypt has been exporting agricultural products since the 1970s, import dependency has also begun to increase³⁶³. Integration into global markets started to increase gradually in the 1980s, and with the rising in population, food imports also increased. This makes Egypt highly dependent on food imports today and leads to being easily affected by changes in global food prices. It has led it to become one of the largest wheat importing countries, especially in recent years. As expected, the 2007-2008 global food crisis created a food security problem for Egypt. In this period, an increase of 130% occurred in grain prices, causing the costs of bread production to double³⁶⁴. The government restricted exports and reduced import tariffs for some food products in the face of rising global prices but could not prevent domestic prices from rising³⁶⁵. Between 2009 and 2010, the number of people using ration cards in Egypt increased to sixty-three million, but this resulted in an excessive increase in expenditures due to both national food subsidies and global food prices. Considering that people in Egypt spend between 40% and 50% of their income on access to food, increases in food prices have an impact on the decrease in purchasing power and thus on food security³⁶⁶. The increase in the price of local bread poses a food security risk for households. Therefore, the Egyptian government had to increase the bread subsidy. In 2008, government expenditures on food surpassed health and education. Still, the government's effort failed to help lower food prices and led to nationwide protests³⁶⁷. In the process of volatile food prices and social unrest until 2011, stable uprisings

³⁶³Tellioglu, Isin, and Panos Konandreas, "Agricultural Policies, Trade and Sustainable Development in Egypt". (Geneva: International Centre for Trade and Sustainable Development (ICTSD) and Rome: United Nations Food and Agriculture Organization (FAO), 2017).

³⁶⁴ Assem Abu Hatab and Sebastian Hess, "'Feed the Mouth, the Eye Ashamed': Have Food Prices Triggered Social Unrest in Egypt?" 2021.

³⁶⁵ Ahmed Farouk Ghoneim, "The Political Economy of Food Price Policy in Egypt," *Food Price Policy in an Era of Market Instability*, 2014, pp. 253-274

³⁶⁶ Giulia Soffiantini, "Food Insecurity and Political Instability during the Arab Spring," *Global Food Security* 26 (2020)

³⁶⁷ Ibid.

against the government continued, leading to a change in the government³⁶⁸. It was influenced by the protests and uprisings in the region, also known as the Arab Spring, in Egypt. In this respect, although Egypt included high budgets in its food subsidy policy, it was easily affected by the situation in the market and failed to provide access to food. In addition, it has been pointed out that the food subsidy program is an inefficient and incomplete response to rising food prices. Based on this, it is noteworthy that the new government gave a promise to increase the quality and quantity of bread. Since 2014, various reforms have been introduced with smart cards and technological innovations, and it has been aimed to quickly access the data on consumed food subsidies. For example, a system was created where people who buy bread with a smart card earn points when they buy less bread and can spend these earned points on different product groups. In the data of 2016, it is observed that the average product variety has increased³⁶⁹. However, Egypt's growing population, the gap between imports and exports, and increases in food prices can threaten Egypt's food security. The high dependence on the global market inevitably leaves Egypt highly vulnerable to food-related problems. However, the Egyptian government has set a self-sufficiency target of 81% and 92%, respectively, for wheat and maize, the most basic agricultural products, in the 2030 targets³⁷⁰.

From an environmental point of view, Egypt is located along the Nile River, where the population and agricultural production are in need. Although the country's contribution to global GHG emissions is seen as small as 0.7%, fossil fuels, which meet the basic

³⁶⁸ Assem Abu Hatab and Sebastian Hess, "'Feed the Mouth, the Eye Ashamed': Have Food Prices Triggered Social Unrest in Egypt?" 2021.

³⁶⁹ Giulia Soffiantini, "Food Insecurity and Political Instability during the Arab Spring," *Global Food Security* 26 (2020)

³⁷⁰ Yumna Kassim et. al, "An agricultural policy review of Egypt: First steps towards a new strategy" (Washington, DC and Cairo, Egypt: International Food Policy Research Institute (IFPRI), 2018)

needs of the country, continue to be the main energy source³⁷¹. However, considering the accumulation of CO2 in the atmosphere, Egypt reached 250 million tons of CO2 emissions in 2018³⁷². With the global accumulation of GHG, the effects of climate change will become more frequent. This causes Egypt to face various problems such as drought due to increasing temperatures, decreased productivity in agricultural production, and water resource scarcity. In addition, the shrinkage of agricultural areas due to the increasing population causes a further decrease in agricultural production in Egypt, which is currently experiencing a drought³⁷³. Moreover, climate change has negative impacts on agricultural production and food systems in Egypt. Increasing temperatures and less precipitation pose great danger. According to the study, it is emphasized that agricultural lands will face an average daily temperature of 3.1 - 3.4 degrees in 2050³⁷⁴. Given that Egypt's agricultural lands already receive limited rainfall and only 3.9% of the country is cultivated, rising temperatures will cause these areas to shrink³⁷⁵. Likewise, with the decrease in annual precipitation, the need for irrigation resources is expected to increase. The population and arable lands built around the Nile throughout history place the greatest stress on the Nile. In particular, the largest use of water in Egypt goes primarily to agriculture and food systems, and this accounts for 82% of the total water supply³⁷⁶. Moreover, agriculture in Egypt is

³⁷⁵ Ibid. p.11

³⁷⁶ Ibid. p.11

³⁷¹ Hassan R. El-Ramady, Samia M. El-Marsafawy, and Lowell N. Lewis, "Sustainable Agriculture and Climate Changes in Egypt," *Sustainable Agriculture Reviews*, 2013, pp. 41-95

³⁷² Lamiaa Abdallah and Tarek El-Shennawy, "Evaluation of CO2 Emission from Egypt's Future Power Plants," *Euro-Mediterranean Journal for Environmental Integration* 5, no. 3 (2020)

³⁷³ Assem Abu Hatab and Sebastian Hess, "'Feed the Mouth, the Eye Ashamed': Have Food Prices Triggered Social Unrest in Egypt?" 2021.

³⁷⁴ Nicostrato D. Perez et al., "Climate-Resilience Policies and Investments for Egypt's Agriculture Sector: Sustaining Productivity and Food Security," *International Food Policy Research Institute (IFPRI)*, 2021

one of the few places in the world where agriculture is entirely irrigated, and some crops can be harvested twice a year³⁷⁷. However, it should be emphasized that due to the increasing temperatures and water use of the Nile Delta, the salinity level can also increase, and agricultural yields can decrease³⁷⁸. As can be seen, water is a key factor for Egypt's agriculture and growing population because the most basic food, wheat, can decrease, and it becomes more vulnerable to problems affecting global food prices³⁷⁹. Considering that more than 35% of the population already fell below the poverty line in 2018³⁸⁰, the impact of climate change on the availability and access of food may cause this rate to increase. However, increasing consumption and population in parallel with the increasing food demand will result in an Egypt that concentrates more on imports. Therefore, it should be underlined that food stability cannot be achieved and that the consumption/production gap will increase with the effects of climate change³⁸¹. Based on this, Egypt shed light on the transition to renewable energy sources by reducing dependency on fossil fuels with the 2030 Sustainable Development Goals and Nationally Determined Contributions³⁸². It has adopted various policies to alleviate or adapt to climate-related pressures on both agriculture and food systems, and water resources. In terms of water resources, it is an important source with the contribution of 95% of the Nile River³⁸³. For this reason, the main

³⁷⁹ Ibid. p.38

³⁷⁷ Ibrahim Soliman, Fabian Capitanio, and Luigi Cerciello, "Risk Assessment of Major Crops in Egyptian Agriculture," *International Agricultural Policy*, 2013.

³⁷⁸ Perrihan Al-Riffai, "How to Feed Egypt: Enhancing Food Availability and Nutrition for a Bulging Population," *Cairo Review of Global Affairs*, 2015.

³⁸⁰ H. Abdelaal, "Food Security Concerns and Sustainable Agricultural Production in Egypt," *Journal of Agricultural Economics and Social Sciences* 12, no. 6 (January 2021): pp. 529-534

³⁸¹ Eman Ahmed Hashem, "The Impacts of Climate Change on Food Security – Case Study: Egypt," *Journal of Economics and Business* 3, no. 2 (2020)

³⁸² The World Bank Group, "Climate Risk Profile: Egypt" (Washington, D.C.: The World Bank Group, 2021)

³⁸³ Egyptian Environmental Affairs Agency (EEAA), "Egypt Third National Communication under UNFCCC", 2016.

objective is to store, desalinate and use the water obtained from the Nile River in the most efficient way. In addition to these, it is aimed to increase modern irrigation techniques and to take joint actions with the countries in the Nile Basin on the use of water resources. For this reason, the climate will be a key element for the continuity of soil management and agricultural production by increasing investments in smart technologies and spreading low-emission agricultural practices³⁸⁴.

In addition, the food crises that developed with the effect of the pandemic and the increase in prices caused Egypt to be affected as well. COVID-19 has brought new challenges to the existing disadvantages of the agricultural and food system in Egypt³⁸⁵. One of these challenges is the declining trade globally because Egypt imports raw materials and various food products. Thus, the stagnated trade network with COVID-19 has also affected Egypt. Moreover, Quarantine and curfews, which are measures that occurred globally, have also shown their effect in Egypt. In particular, the closure of restaurants and businesses caused short-term disruptions in food demands. Likewise, the labor-dependent agriculture and food sector has been hit hard by COVID-19. The disruptions from production to transportation created difficulties in Egypt and led to contractions and pauses in the food-based sectors. The Egyptian government lifted the curfews for the workforce to prevent these problems in the food and agriculture sector. In addition, in 2021, Egypt was able to stabilize its inflation at 7% despite rising global food prices³⁸⁶. Still, nearly all households have suffered from economic recessions. In addition to those who are already poor and have difficulty accessing food, the urban has also witnessed declines in incomes and economic activities. On the other hand, the urban population has been easier to cope with the

³⁸⁴ Ibid.

³⁸⁵The UN Industrial Development Organization. "Agri-food and COVID-19 in Egypt: Adaptation, Recovery and Transportation", 2020

³⁸⁶ Ahmed Wally and Olutayo O. Akingbe, "The Resilience of the Egypt Economy in the Face of COVID-19 Shocks and High Commodity Prices" (USDA, Foreign Agricultural Service, 2022).

effects of COVID-19 than the poor and rural people³⁸⁷. It is noteworthy that the effects of COVID-19 will continue to be overcome in 2022 and that the deficiencies and structural changes in the agriculture and food sector are currently encouraged by the government³⁸⁸.

Finally, it is predicted that the Russia/Ukraine crisis will affect Egyptian food security³⁸⁹. They are suppliers of various agricultural products to the countries in the MENA region, and Egypt remains a key importer in the region. Egypt imports Russia "45% of Russian grain and 24% of Ukrainian grain³⁹⁰". This may cause Egypt to be affected by disruptions in the food supply that the two countries may cause. Moreover, it may lead to an increase in Baladi bread used in food subsidies in the Egyptian market. Also, Russia/Ukraine war will increase the risks to the Egyptian economy and food security³⁹¹. On the other hand, it is suggested that Egypt will import wheat from different countries, and the food subsidy program needs to be used more efficiently³⁹². However, Egypt's food supply for oilseeds and wheat is increasing due to bread and vegetable oil that will be subsidized to the 105 million population in the future. In addition, the budget allocated to food subsidies and rising global food prices creates a fragile situation for Egypt. Those force Egypt to think about problems beyond imports; malnutrition, an increase in social unrest, and an increase in domestic market prices³⁹³.

³⁹⁰ Ibid. p.1

³⁹¹ Ibid.

³⁸⁷ Clemens Breisinger et al., "Impact of Covid-19 on the Egyptian Economy: Economic Sectors, Jobs, and Households," *International Food Policy Research Institute (IFPRI)*, 2020

³⁸⁸ The UN Industrial Development Organization. "Agri-food and COVID-19 in Egypt: Adaptation, Recovery and Transportation", 2020

³⁸⁹ Eduard Soler Lecha, "Communicating Vessels: How Does the War in Ukraine Affect the Middle East and North Africa?" *Barcelona Center for International Affairs*, 2022.

³⁹² Caitlin Welsh, "The Impact of Russia's Invasion of Ukraine in the Middle East and North Africa," *Center for Strategic & International Studies*, 2022.

³⁹³ Tim G. Benton, Antony Froggatt, and Laura Wellesley, "The Ukraine War and Threats to Food and Energy Security," *Chatham House*, 2022.

To prevent this vulnerable situation and reduce food security risks, Egypt has to consider long-term solutions such as new trade partnerships with the EU and the USA, increasing sufficient and sustainable arable land, and reducing the stress on water resources³⁹⁴. Thus, the share of the agriculture and food sector in GDP may increase, and the trade deficit can eventually decrease.

4.5. Food Security Policies of Brazil

Brazil is a country located in the Latin American region and has become one of the largest economies in the region and even in the world³⁹⁵. This country has achieved the greatest development in the agricultural sector and has reached the status of the world's largest agricultural exporter from its position as an agricultural revolutionist in the 1960s. Brazil exports various products such as soybeans, sugar cane and bioethanol, coffee, and grain groups and has a critical position in the global market. Brazil is making a variety of policies and advances in agriculture and food, with technological advances, economic reforms, and infrastructural improvements. The importance of these policies in terms of ensuring food security in economic and social terms is especially important. On the other hand, the growth of agricultural production and the continuity of social development expose Brazil to environmental problems. Climate change impacts and deforestation in Brazil remain a major challenge³⁹⁶. Brazil

³⁹⁴ Michaël Tanchum, "The Russia-Ukraine War Has Turned Egypt's Food Crisis into an Existential Threat to the Economy," *MEI Policy Center*, 2022.

³⁹⁵ Ivo Zdráhal et al., "Brazil's Comparative Advantages and Specialization Dynamics in Agri-Food Trade," *Agris Online Papers in Economics and Informatics* 13, no. 2 (2021): pp. 121-139

³⁹⁶ OECD, "Innovation, Agricultural Productivity and Sustainability in Brazil", (Paris: OECD Publishing, 2015)

has to bring stronger efforts to achieve its success in agricultural production and exports through the reduction of poverty and environmental degradation and improvements to the food system in a sustainable way³⁹⁷. Brazil emerges as a country that produces and exports various food product groups in its region and in the global market. 90% of these foods and agricultural products are produced nationally³⁹⁸. According to 2017 data³⁹⁹, Brazilian agriculture provides 5.8 people per hectare in the country to reach sufficient calories, while another study states that 81.3% of the households in Brazil were in food security in 2009⁴⁰⁰. Likewise, according to a study by Ren et al., the rate of self-sufficient food among the BRICS countries, that are Brazil, Russia, India, China, and South Africa, reached the highest levels, exceeding 100% in Brazil between 2000 and 2013⁴⁰¹.

Specifically, with the Family Farming program, which started to increase its impact in the 1990s, labor and loans were provided to farm owners in rural areas. Both were ensuring rural development and eliminating the disadvantages in this region have been among the main objectives of the program. Small and medium-sized producers in the rural area contribute to regional/national development while helping to ensure food security⁴⁰². In the following process, not only loans are provided, but also modern

³⁹⁷ Luiz A Martinelli et al., "Agriculture in Brazil: Impacts, Costs, and Opportunities for a Sustainable Future," *Current Opinion in Environmental Sustainability* 2, no. 5-6 (2010): pp. 431-438

³⁹⁸ Brazilian Institute of Consumer Protection, "The Five Dimensions of Food Systems in Brazil: Literature Review," 2022.

³⁹⁹ João Pompeu et al., "Is Domestic Agricultural Production Sufficient to Meet National Food Nutrient Needs in Brazil?" *PLOS ONE* 16, no. 5 (2021)

⁴⁰⁰ Lorena Vieira Costa, Marília Fernandes Gomes, and Davi Augusto de Lelis, "Food Security and Agricultural Productivity in Brazilian Metropolitan Regions," *Procedia Economics and Finance* 5 (2013): pp. 202-211

⁴⁰¹ Yufeng Ren et al., "Development and Prospect of Food Security Cooperation in the BRICS Countries," *Sustainability* 12, no. 5 (September 2020)

⁴⁰² Issa Ibrahim Berchin et al., "The Contributions of Public Policies for Strengthening Family Farming and Increasing Food Security: The Case of Brazil," *Land Use Policy* 82 (2019): pp. 573-584

technologies and new investors are provided to reach these regions. While Brazil supports the reduction of poverty and regional development with the program, it also enables the increase of agricultural production and the increase of the economic contribution of agricultural trade⁴⁰³. In addition, according to OECD, it is estimated that arable land for crops such as oilseed, sugarcane, and wheat contribution will grow in 2024⁴⁰⁴. However, even though Brazil has reached the top levels in food production and self-sufficiency, one of the biggest problems is that food can be distributed equally in the country⁴⁰⁵. People's access to food is at risk as Brazil suffers from income distribution and social inequalities. It is important to emphasize this inequality because the food insecurity of the households in the Northeast of Brazil is 21%, while those in the Southern part are 5%⁴⁰⁶.

Agriculture has a critical position in Brazil in terms of socio-economic policies. The agriculture and food sector has contributed to Brazil's development and becoming a major exporter in the last 40 years. While the agricultural volume of Brazil increased by 385%⁴⁰⁷, the agricultural food export value exceeded 77 million dollars⁴⁰⁸ in 2017. The contribution of these agricultural products to Brazil's foreign trade reaches 22%⁴⁰⁹.

⁴⁰⁹ Ibid.

⁴⁰³ Ibid.

⁴⁰⁴ OECD, "Brazilian agriculture: Prospects and challenges", *in OECD-FAO Agricultural Outlook 2015*, (Paris: OECD Publishing, 2015)

⁴⁰⁵ Brazilian Institute of Consumer Protection, "The Five Dimensions of Food Systems in Brazil: Literature Review," 2022.

⁴⁰⁶ Lorena Vieira Costa, Marília Fernandes Gomes, and Davi Augusto de Lelis, "Food Security and Agricultural Productivity in Brazilian Metropolitan Regions," *Procedia Economics and Finance* 5 (2013): pp. 202-211

⁴⁰⁷ Ministry of Agriculture, Livestock and Food Supply of Brazil, "Guidelines for the Sustainable Development of Brazilian Agriculture", 2020.

⁴⁰⁸ Ivo Zdráhal et al., "Brazil's Comparative Advantages and Specialization Dynamics in Agri-Food Trade," *Agris Online Papers in Economics and Informatics* 13, no. 2 (2021): pp. 121-139

Thus, Brazil's share in global trade was 1.2% in 2017^{410} , and the agricultural sector's contribution to the Brazilian economy constitutes 27% in 2020⁴¹¹. Thirty percent of the total land in the country continues to be used for agricultural production. In this respect, Brazil's effective continuation in global markets is closely related to the protection and quality of agricultural production and food systems⁴¹². In addition, employment in agriculture and food continues to grow. According to the OECD, Brazil's employment in this field has reached 18%⁴¹³. Thus, the rise in household incomes in Brazil since the 1970s, the decrease in food prices, and the reduction of pressures on inflation progressed positively with agricultural productivity and employment⁴¹⁴. Furthermore, Brazil's interventionist policies in the 1940s gradually declined over the years. In the 1950s, while overly broad controls were applied to supply and food prices in the field of agricultural production and the food sector, subsidies were made to producers and consumers with the price support system. The policies evolved in a different direction in the late 1980s and early 1990s⁴¹⁵. Especially with the integration of the free market into the Brazilian economy, privatizations, and the reduction of state intervention, changes have started. The functions of state-owned enterprises in agriculture were reduced, and incentives were made for producers to enter world markets comfortably. Although the support given to producers gradually

⁴¹⁰ Issa Ibrahim Berchin et al., "The Contributions of Public Policies for Strengthening Family Farming and Increasing Food Security: The Case of Brazil," *Land Use Policy* 82 (2019): pp. 573-584

⁴¹¹ Sergio Barros and Vandoir Silva, "Brazilian Economic and Agricultural Overview" (USDA, Foreign Agricultural Service, 2022).

⁴¹² Ministry of Agriculture, Livestock and Food Supply of Brazil, "Guidelines for the Sustainable Development of Brazilian Agriculture", 2020.

⁴¹³OECD, "Innovation, Agricultural Productivity and Sustainability in Brazil", (Paris: OECD Publishing, 2015)

⁴¹⁴ OECD, "Brazilian agriculture: Prospects and challenges", *in OECD-FAO Agricultural Outlook 2015*, (Paris: OECD Publishing, 2015)

⁴¹⁵ OECD, "Agricultural Policy Monitoring and Evaluation 2021: Addressing the Challenges Facing Food Systems", (Paris: OECD Publishing, 2021). pp. 142-156

decreased in the 2000s, subsidized credit and insurance programs for producers increased⁴¹⁶. In addition, Brazil's multinational companies were able to attract the region and made investments that contributed to the increase in agricultural production⁴¹⁷. However, Brazil was affected by the 2007 - 2008 global food crisis. In June 2008, food inflation exceeded 18%, leading to an increase in poverty in Brazil. The fact that Brazil is one of the global exporters was also greatly affected by the quotas and tariffs that countries brought one after the other⁴¹⁸. The government has increased agricultural production to reduce the effects of the crisis, and it has become significant for fighting poverty with its policy called Bolsa Familia⁴¹⁹. It is aimed to prevent poverty from exacerbating the increasing global food prices by providing financial support to poor families. In this respect, a monetary resource program reached 12.8 million families in 2010^{420} . Thus, it is observed that the households, which experienced economic difficulties in purchasing and accessing food due to the 2008 crisis, decreased in 2010⁴²¹. In addition, it continues to pave the way for concentrating on social and environmental problems in the country with economic developments. Considerable progress has been achieved with the food and agriculture

⁴¹⁶ Ibid.

⁴¹⁷ Constanza Valdes, Kim Hjort, and Ralph Seeley, "Brazil's Agricultural Competitiveness" (USDA, Economic Research Service, 2020).

⁴¹⁸ Francisco H. Ferreira et al., "Rising Food Prices and Household Welfare: Evidence from Brazil in 2008," *Journal of Agricultural Economics* 64, no. 1 (2012): pp. 151-176

⁴¹⁹ Filho, Niemeyer Almeida, and Neder, Henrique Dantas, (2015), "Food Security in Brazil: An Analysis of the Effects of the Bolsa Família Programme," *Review of Agrarian Studies* 5, no.2 (2015)

⁴²⁰ Francisco de VASCONCELOS et al., "Public Policies of Food and Nutrition in Brazil: From Lula to Temer," *Revista De Nutrição* 32 (2019)

⁴²¹ Filho, Niemeyer Almeida, and Neder, Henrique Dantas, "Food Security in Brazil: An Analysis of the Effects of the Bolsa Família Programme," *Review of Agrarian Studies* 5, no.2 (2015)

policies that Brazil has been pursuing for many years and the institutionalization of these policies⁴²².

Additionally, Brazil has identified several policies and strategies for solving agriculture, food, and community development problems. The oldest of these is the "National School Feeding Program" (PNAE), which was created in the early 1940s⁴²³. This program is one of the largest food programs implemented in schools globally. Moreover, the program promotes adequate nutrition for all students in schools, from kindergarten to high school. Thus, starting from the bottom, students are provided with the opportunity to access sufficient and healthy food with the support of the state. A budget expenditure of 1.7 billion dollars was made in 2010 for students who could reach two hundred school days of food per year thanks to the program⁴²⁴. Moreover, in 1993, a program on food and nutrition security, known as the Campaign Against Hunger, created in partnership with non-governmental organizations and the public, was introduced. A year later, the Hunger Map program was included in this program, and policies were targeted to end poverty and hunger throughout the country⁴²⁵. Food subsidies were given to deliver priority to the most vulnerable regions, and efforts were made to ensure access to rights such as education, health, and work. In this way, 14.8% of those facing hunger, according to 1992 data, achieved remarkable success by decreasing to 5% in 2016⁴²⁶. In 2010, "The National Food and Nutritional Security Policy" (PNSAN) emphasized that food security is a human right, emphasizing a goal for every person in the country to reach sufficient and nutritious food. It is important

426 Ibid.

 ⁴²² Francisco de VASCONCELOS et al., "Public Policies of Food and Nutrition in Brazil:
From Lula to Temer," *Revista De Nutrição* 32 (2019)

⁴²³ Darana Souza and Danuta Chmielewska, "Public Support to Food Security in India, Brazil and South Africa," *International Policy Centre for Inclusive Growth*, 2011.

⁴²⁴ Ibid.

⁴²⁵ Jennifer Constantine and Mariana Santarelli, "Brazil's Food and Nutritional Governance Plan," *International Learning Series*, 2017.

in terms of providing access to water and food by reaching areas where hunger and food insecurity are experienced with other policies⁴²⁷. Thus, it should be noted that the progress in Brazilian food security policies parallels the improvements in the agricultural sector, income increases, economic growth, etc.⁴²⁸.

In the environmental context, Brazil does not ignore the impact of climate change on the region to sustain agricultural growth, but the environmental damage is still remaining. Within the scope of national policies, it continues to progress on three issues; climate change, water resources, and environmental policies⁴²⁹. Moreover, Brazil has contributed more than 1% of the global share of CO2 emissions in 2020⁴³⁰. The biggest reason behind this is Brazil's land use and deforestation, unlike other countries' consumption of fossil fuels. In terms of land use, the largest carbon emissions come from the agriculture sector (25%), while the energy sector is just below it⁴³¹. Forest areas are destroyed to be used for industrial resources or converting them into agricultural areas. Three large forest areas in Brazil have been destroyed: Amazon Forest, Atlantic Forest, and Cerrado⁴³². It is stated that almost 20% of the Amazons were destroyed, and this is due to the poor functioning of the government's

⁴²⁷ Danuta Chmielewska and Darana Souza, "The food security policy context in Brazil", *International Policy Centre for Inclusive Growth*, no.22 (2011)

 ⁴²⁸ Issa Ibrahim Berchin et al., "The Contributions of Public Policies for Strengthening Family Farming and Increasing Food Security: The Case of Brazil," *Land Use Policy* 82 (2019): pp. 573-584

⁴²⁹ OECD, "Innovation, Agricultural Productivity and Sustainability in Brazil", (Paris: OECD Publishing, 2015)

⁴³⁰ Monica Crippa et. al, "GHG emissions of all world countries", *Joint Research Centre*, (Luxemburg: Publications Office of the European Union, 2021)

⁴³¹ Brazilian Institute of Consumer Protection, "The Five Dimensions of Food Systems in Brazil: Literature Review," 2022

⁴³² Luiz A Martinelli et al., "Agriculture in Brazil: Impacts, Costs, and Opportunities for a Sustainable Future," *Current Opinion in Environmental Sustainability* 2, no. 5-6 (2010): pp. 431-438

policies toward this destruction and the inability to prevent illegal foresters⁴³³. In fact, the deactivation of the fine imposed on illegal foresters in 2019 poses a problem in this respect. It put Brazil in a very vulnerable position because the effects of climate change are accelerating with deforestation. Although the areas for agricultural production are growing, environmental degradation and climate change effects are progressing in parallel. In addition, the tropical region of Brazil is very vulnerable to natural disasters, and the impact of climate change on the region will increase the risks of these natural disasters, such as high temperatures, high precipitation regimes, floods, and landslides. These risks can cause food production to diminish and become inefficient. Furthermore, the agricultural sector uses more than 60% of freshwater resources in the country, and the stress on water resources can increase⁴³⁴. Even if Brazil uses its agricultural production and water resources in the most efficient way with technological developments, hot temperatures and irregular precipitation pose a serious threat. Due to the risks of flood or drought according to the regions, regional planning has been done with Brazil's climatic zoning or agroecological zoning strategy. In addition, it is aimed to minimize the risks in agricultural production because it makes it easier for seeding and planting⁴³⁵. In addition, "Brazil's Agricultural Policy for Climate Adaptation and Low Carbon Emission" provides a new framework for the risks of climate change, planned by 2030^{436} . This policy is aimed to make improvements in various fields such as water resource management, spreading climate-smart applications, farmer support, and loan programs. One of the most important points is the conversion of almost fifteen million hectares of pasturelands into arable land instead of forest areas that have been destroyed and converted into

⁴³³ Katyanne V. Conceição et al., "Government Policies Endanger the Indigenous Peoples of the Brazilian Amazon," *Land Use Policy* 108 (2021)

⁴³⁴ OECD, "Innovation, Agricultural Productivity and Sustainability in Brazil", (Paris: OECD Publishing, 2015)

⁴³⁵ Ibid.

⁴³⁶ Ministry of Agriculture, Livestock and Food Supply of Brazil, "Plan for adaptation and low carbon emission in agriculture strategic vision for a new cycle", 2021.

arable land⁴³⁷. The main objectives are to reduce GHG emissions without reducing agricultural production and causing income losses, and to prevent problems that may affect food security by increasing adaptation and resilience to climate-related problems.

The recent global challenges, COVID-19 and Ukraine/Russia conflict also have been affecting the agricultural and food policies. The first one, COVID-19, has had a major economic, social, and political impact on Brazil, exacerbating poverty and hunger⁴³⁸. On the other hand, it is mentioned that the negative effects of the COVID-19 pandemic on the dimensions of food security are quite diverse⁴³⁹. In terms of food availability, disruptions in the production of Family Farming and food losses have emerged. At the same time, the pandemic caused the National School Food Program to pause. All over the world, the exposure of employees in the food and agriculture sector to curfews and the closure of restaurants and food businesses have caused pauses and economic slowdown. It should be noted that the Bolsa Familia, one of Brazil's most important programs, has not had enough influence⁴⁴⁰. For example, only 12% of the budget allocated for the program was effectively delivered to households⁴⁴¹. On the other hand, government support has been tried to be increased with aid, loans, and incentive packages for vulnerable regions and workers. In order not to decrease agricultural production and to prevent disruptions in food systems, it has been tried to be supported by measures such as payment facilities, insured cultivated areas, and direct

⁴⁴⁰ Ibid.

⁴³⁷ Ibid.

⁴³⁸ Carolina Abreu Carvalho, Poliana Cristina Viola, and Naiara Sperandio, "How Is Brazil Facing the Crisis of Food and Nutrition Security during the COVID-19 Pandemic?" *Public Health Nutrition* 24, no. 3 (December 2020): pp. 561-564

⁴³⁹ Rita de Ribeiro-Silva et al., "Covid-19 Pandemic Implications for Food and Nutrition Security in Brazil," *Ciência &Amp; Saúde Coletiva* 25, no. 9 (2020): pp. 3421-3430

⁴⁴¹ Carolina Abreu Carvalho, Poliana Cristina Viola, and Naiara Sperandio, "How Is Brazil Facing the Crisis of Food and Nutrition Security during the COVID-19 Pandemic?" *Public Health Nutrition* 24, no. 3 (December 2020): pp. 561-564

payments⁴⁴². The fight against the pandemic also underlines the importance of reaching vulnerable areas and groups at risk. In addition, food safety rules have also brought to light the importance of hygiene controls, storage areas, and sanitation within the food supply chain in the country. Expanding studies on both food security and safety and taking new strategic measures will be a major step⁴⁴³.

Lastly, the effect of the Ukrainian-Russian war on Brazil is significant. In this respect, considering that Russia is one of the global oil and fertilizer producers, increases in oil and natural gas prices may indirectly affect Brazil as well. Moreover, Brazil's dependence on Russia's fertilizers may pose risks in the face of embargo and trade restrictions. Brazil imports 85% of its fertilizers. In addition, the share of fertilizer use in other countries corresponds to 8%⁴⁴⁴. The war may cause a decrease or pause in the supply of fertilizers, as well as a decrease in the yield of crops in Brazil. In this respect, the Brazilian government has stated that it will trade with other countries to reduce this dependency, and it plans to support the production of private companies by reducing fertilizer imports by half⁴⁴⁵. On the other hand, Brazil's imports to Russia and Ukraine corn and wheat are low, but volatility in global prices may affect Brazil. However, the reductions in Ukraine's maize exports could affect the Brazilian poultry sector. This may be due to both the decrease in global supply and the increase in prices. In this respect, it is expected that these producers will tend to trade with different countries⁴⁴⁶.

⁴⁴² OECD (2021), Agricultural Policy Monitoring and Evaluation 2021: Addressing the Challenges Facing Food Systems, OECD Publishing, Paris. pp. 142-156

⁴⁴³ Carolina Abreu Carvalho, Poliana Cristina Viola, and Naiara Sperandio, "How Is Brazil Facing the Crisis of Food and Nutrition Security during the COVID-19 Pandemic?" *Public Health Nutrition* 24, no. 3

⁴⁴⁴ Joana Colussi, Gary Schnitkey and Carl Zulauf, "War in Ukraine and its Effect on Fertilizer Exports to Brazil and the U.S.", *farmdoc daily* 12, no.34 (2022)

⁴⁴⁵ Ibid.

⁴⁴⁶ "Russian and Ukraine Conflict Likely to Impact Brazilian Issuers Across Several Sectors," *Fitch Ratings*, 2022. <u>https://www.fitchratings.com/research/corporate-finance/russian-ukraine-conflict-likely-to-impact-brazilian-issuers-across-several-sectors-04-03-2022</u> (accessed on June 02, 2022)

According to the data of the USDA, Brazil may increase its corn production volume to double as the world corn exporter between 2022 and 2023⁴⁴⁷. Glauben et al. stressed that countries such as Brazil and the USA could fill this gap in the global food supply of various grain groups⁴⁴⁸. Similarly, according to Colussi et al., countries such as Brazil and the USA will be able to increase their trade volumes in parallel to ensure the supply of wheat and reduce its global price⁴⁴⁹. Furthermore, the Brazilian Agricultural Research Institute (Embrapa) is moving with the strategies of turning the unused pasturelands into the cultivation area, as well as the climate-sensitive wheat seeds that it is currently developing. Thus, both the cultivation area will be expanded, and the global and regional supply of wheat will be provided⁴⁵⁰.

4.6. Conclusion

It is clear that a range of factors shapes the policies and strategies of countries in the field of food and agriculture to ensure food security at the national level. Food and agricultural policies also include economic, environmental, and social dynamics in terms of ensuring food security. Their food and agriculture policies are presented with a historical framework and show that food security is centre policy. With this historical framework, the political economy of food security in global problems is emphasized, and the more recent global pandemic and the conflict created by the Russia-Ukraine war are included. Considering the economies, trade capacities, and agricultural

⁴⁴⁷ Olga Liefert, Angelica Williams, and Claire Hutchins, "Feed Outlook: May 2022," ed. Michael McConnell (USDA, 2022).

⁴⁴⁸ Thomas Glauben et al., "The War in Ukraine, Agricultural Trade and Risks to Global Food Security," *Intereconomics* 57, no. 3 (2022): pp. 157-163.

⁴⁴⁹ Joana Colussi, Gary Schnitkey and Carl Zulauf, "War in Ukraine and its Effect on Fertilizer Exports to Brazil and the U.S.", *farmdoc daily* 12, no.34 (2022)

⁴⁵⁰ Ibid.

productions, the availability of food and its access within the country become significant. From this point of view, the effects of a country's economic development, export and import movements, and agricultural production on the provision of food supply and the continuity of food supply are emphasized. Likewise, the food crisis created by the increases in global food prices or volatility has been one of the focal points of countries in determining new strategies and programs.

Moreover, the effects of climate change in different dimensions on the food supply and supply chain lead to the formation of new agendas. The pressures on agricultural production and food systems due to increasing temperatures and water scarcity become clearer and deeper with the effects of climate change, pushing countries to work on this issue. Although the effects of climate change vary according to different dimensions and regions, a disruption and pause that may occur in the food systems and supply chain in the globalizing world can easily cause other countries to be affected. In this respect, the impact of the COVID-19 epidemic on the global food supply by spreading rapidly all over the world and the Ukraine-Russia crisis that started in the first quarter of 2022 will continue to affect the food and agriculture sectors of the countries. It underlined how food and agricultural policies are shaped in terms of ensuring food security and which factors may be affected in the future by addressing the positive and negative effects of the four countries in detail.

To sum up, it is necessary to examine from various perspectives to understand food security due to its complex and multidimensional nature. Hence, economic, environmental, political, and even social factors are integral part of these four countries' food security policies. Countries have followed a wide range of strategies and policies, such as eliminating hunger and poverty, increasing agricultural production, and rural development. Especially in the face of global problems, such as environmental problems, food supply crisis, COVID-19, Ukraine-Russia crisis, the policies, strategies, and power struggles adopted by countries become prominent. The key point is that the priorities and interests of the countries may differ to overcome the challenges of food security they face even though need to be overcome common

actions at global level. It is noteworthy how food security is managed within these countries and on which factor/factors their priorities are shaped at the end of the day.

CHAPTER 5

CHALLENGES FOR FOOD SECURITY AND AGRICULTURE

5.1. Introduction

Food security is affected by various interconnected global challenges. The interdependency of many challenges such as political economy, environment, technology, and health are prominent in this chapter. In this respect, the following sections will focus on the current situations of food systems and agricultural production by examining those global challenges to food security.

In the first section, the impact of economic and market challenges will be discussed. The main objective is to show the negative effects of rising food prices, global volatility in prices, and threats created by economic shocks on food security.

In the following section, the effects of environmental challenges, especially climate change impacts on water and land are covered, including the effects on food systems and agricultural production.

In the other section, in the light of the developments in the field of biotechnology, the agricultural production technique with GMOs is compared with organic agriculture. The main purpose is to discuss the positive and negative aspects of these two techniques and their advantageous and disadvantageous situations within the food system.

In the last section, the main object is to show the effects of war, conflict, and pandemics, on the food system and agricultural production and on the dimensions of

food security. The economic and social problems of COVID-19 are discussed, and the consequences at various levels of food security are indicated. Following this, the political and social effects of wars and conflicts, as well as the economic consequences on food security, are mentioned. In particular, the occupation of Ukraine by the Russian Federation that took place in the first half of 2022 emphasizes the inability to supply food globally, the deterioration of regional food systems, and the inability of individuals to access food, malnutrition, and migration.

5.2. Economic and Market Challenges for Food Security and Agriculture

Agricultural production symbolizes activities that involve direct usage of nature to meet one of the basic needs of humanity. It symbolizes a living structure as agricultural activities have occurred over and over again. People reproduce their wide range of agricultural products in accordance with the most accurate growing conditions and regions continuously. However, agricultural production is not only crops and lands but a bunch of systems indeed. Furthermore, as the population continues to increase day by day, producing enough food for all people and proportionally accessing the food by everyone emerges as a difficulty. It is aimed to boost the existing food production capacity and protect the current ecosystem balance without deteriorating with the steps to be taken and preventive policies to meet the food needs of the future population. By 2050, the agricultural sector will face the challenge of producing 60% more than the current supply of food to maintain the global population, which is estimated to become 9.3 billion ⁴⁵¹.

⁴⁵¹ FAO. "Building a common vision for sustainable food and agriculture: Principles and Approaches". (2014)

Production in the agricultural sector is the cultivation of a crop within a certain time and condition and then harvesting. There are following stages such as distribution and packing but can differ according to the food product. These stages create a food system from seed to putting food on the plate. Moreover, all sovereign countries have the responsibility to supply food to their population, so they need to be prepared for crises and increasing food prices on the economic side of food security and agriculture. The several types of levels and actions by countries to increase agricultural production and ensure food security can vary⁴⁵². As consumption of food continues to rise, elimination of trade barriers, expansion of croplands, and early prevention of economic crisis on agricultural and food products have become key instruments to meet increasing demands⁴⁵³. Additionally, some countries are eager to displace arable land or cropland for housing or destroy natural areas such as forests to have croplands⁴⁵⁴.

Importantly, food prices and economic crises are crucial elements for food security and agriculture because accessing food also has a close connection with prices. Thus, this connection can be linked to volatility in food prices and instability in market dynamics which can further deeply problems of poverty and hunger⁴⁵⁵. The volatility and instability raise global concerns over the food market. Especially in the developing countries and poorer areas in the parts of the world, lots of households are the owner of agricultural lands, so they produce to sell agricultural goods for income⁴⁵⁶. Hence,

⁴⁵²Madina A. Abdulkadyrova et al., "Global Food Security Problems in the Modern World Economy," *International Journal of Environmental and Science Education* 11, no. 12 (2016): 5320–30.

⁴⁵³ FAO. "The State of Agricultural Commodity Markets". (Rome:FAO, 2018).

⁴⁵⁴Woertz Eckart et. al. "The Impact of Food Price Volatility and Food Inflation on Southern and Eastern Mediterranean Countries." *Economics*, 2: (2014) pp.1–9.

⁴⁵⁵ Jean Baptiste Habyarimana and Sandrine Unezeza, "External Economic Shocks and Food Price Volatility in Rwanda: Evidence from the ARCH and GARCH Models," *East Africa Research Papers in Economics and Finance*, (2018) pp. 1–22.

⁴⁵⁶ FAO, IFAD, IMF, OECD, UNCTAD, "Price Volatility in Food and Agricultural Markets : Policy Responses," 2011. World Bank, Washington, DC.

the volatility and instability can make worsen the situation and endanger developments. These developments are closely related to the economy of a country with better infrastructure and better technologies for agricultural production. Moreover, using harvesting machines in cropland cannot fully function in a lack of infrastructure or people to use them. The lack of better conditions in agriculture can lead countries to be left behind them in the global market. Thus, less integration in the global market and low productivity conduce to a frequency of increase in domestic food prices⁴⁵⁷. In addition, when domestic food prices start to increase, the purchasing power of households gets affected as well. According to Jayasuriya et al., people who suffer from poverty spend more than half of their incomes on food⁴⁵⁸. They are the net buyers, so volatility in food prices - directly affects them and leads to the worsening of the household level of food security. It is stressed that the primary need is to have access to food in the poorer areas. However, other needs such as education and health can be posed a danger⁴⁵⁹. In this respect, states need to take responsibility for eliminating this danger.

Furthermore, the agricultural sector and food security are quickly affected by an economic crisis, resulting from both internal and external problems⁴⁶⁰. Both have connected with other sectors in economic terms. However, there are major elements that separate the agriculture sector from others in economic terms. According to John Weeks, this sector lies in the wide range of economic activities such as purchasing and marketing. Hence, this creates close relations among the other sectors that have interactions. If producers decide to sell their maize after harvesting, they need to follow

⁴⁵⁷ George Rapsomanikis and Harriet Mugera, "Price Transmission and Volatility Spillovers in Food Markets of Developing Countries," *Methods to Analyse Agricultural Commodity Price Volatility*, 2011, pp. 165-179

⁴⁵⁸ Sisira Jayasuriya, et. al, "Food price spikes, increasing volatility and global economic shocks: coping with challenges to food security in Asia". (Bangkok: FAO, 2012).

⁴⁵⁹ Ibid. p.46

⁴⁶⁰ Jan Douwe van der Ploeg, "Agricultural production in crisis". In *Handbook of Rural Studies* (2016) 1–526. Routledge International.

the food systems' chain: production to consumption. In every stage, there are several types of interactions that have been made to sell the maize through economic activities. For instance, the producer needs a source of fuel to transport the maize to another market. The economy lies fundamentally in the food system chain, and economic activities can affect the whole chain⁴⁶¹. Considering the relationship between supply and demand, seasonal and year-to-year movements play a role in determining prices. Attention is drawn primarily to the prices of basic crops such as wheat, maize, and rice because price increases in basic foods may affect price increases in other foods and, subsequently, the purchasing power of households in a country. For this reason, volatility in food prices, which are also politically important, is not the desired situation for governments and the global food market⁴⁶². This volatility can be explained by how much a particular food price rises or falls from what is expected over a period and how often it happens. In 2007 - 2008, global food prices rose considerably, and volatility created concerns. These concerns continued in the following years, as basic food prices, which had fallen in 2009, rose again in 2011 and fell again in 2016. Furthermore, Clapp underlined the volatility of food prices and how the global economy was affected while creating vulnerability for food availability⁴⁶³. The scholar mentioned that the macroeconomic factors had a significant role in the 2007-2008 crisis. The slowdown in the global economy caused a rise in food prices, and it ended in more trade limitations and a global recession. In addition, foreign producers may raise prices to compensate for the declining dollar because agricultural commodities are priced in dollars⁴⁶⁴. During this crisis, The US Federal Reserve continued to reduce interest rates as a precaution because it was intended to prevent

⁴⁶¹John Weeks, "Economic Policy for Agriculture : A Guide for FAO Professionals". *Centre for Development Policy and Researchs*, 44, (1999): 1–59.

⁴⁶² Global Panel, "Managing food price volatility: Policy Options to Support Healthy Diets and Nutrition in the Context of Uncertainty". *Policy Brief*, (4). 2016.

⁴⁶³ Jennifer Clapp, "Food Price Volatility and Vulnerability in the Global South: Considering the Global Economic Context," *Third World Quarterly* 30, no. 6 (2009): pp. 1183-1196.

⁴⁶⁴ Ibid.

food increases by keeping the dollar weakened against other currencies. In addition, as the value of the dollar decreased, it led to an increase in investments in agricultural commodities. As early as 2008, almost US70 billion had been invested in agricultural commodities – a total of four hundred billion from 2005⁴⁶⁵.

In addition, oil can be mentioned as an important input involved in the transportation and harvesting of crops. In terms of economic costs in the food system, oil prices play a vital role in crises. Increases in oil prices directly affect many areas of the food system, which in turn affects food price crises. It triggers economic policies both in domestic and foreign markets⁴⁶⁶. This can cause inflation and economic stagnation in the country, especially for oil-exporting countries, as increases in oil prices will indirectly affect food prices. It also inflicts a major blow on the purchasing power of households. Naturally, this continues to broaden the negativity of food security in many ways. It would be proper to give Turkey as an example for this case. Turkey, which is an oil exporting country, is affected by the increases in terms of both agricultural production and transportation costs. The country has already been suffering from the climate crisis, the volatility in the currency, the refugee crisis, and, thus, any increase in oil prices will affect Turkey⁴⁶⁷. It needs to be mentioned that fossil fuels, especially oil and gas, increase dependency on exporters. Any increases can affect not only the economy but also the socio-political balance in a country from a net exporter of fossil fuels. In that regard, the governments regulate their political economy in the food market and food prices to get rid of any volatility. The governments keep figuring out the equilibrium between politics and the economy.

⁴⁶⁵ FAO, IFAD, IMF, OECD, UNCTAD, "Price Volatility in Food and Agricultural Markets : Policy Responses," 2011. World Bank, Washington, DC.

⁴⁶⁶ Jean Baptiste Habyarimana and Sandrine Unezeza, "External Economic Shocks and Food Price Volatility in Rwanda: Evidence from the ARCH and GARCH Models," *East Africa Research Papers in Economics and Finance*, 2018, 1–22.

⁴⁶⁷Eckart Woertz et. al. "The Impact of Food Price Volatility and Food Inflation on Southern and Eastern Mediterranean Countries". *Economics*, *2*, (2014):1–9.

They need to maintain food policies during economic crises to reduce societies' concerns. Hence, it is important to reach the straightest line for volatility in countries.

Additionally, the supply and demand of food are subject to volatility. The effects of economic shocks can turn into volatility, but the extent of degree is ruled by reactions of the production and consumption side. The equilibrium of supply and demand shows the volatility in a better way⁴⁶⁸. The need is to balance supply and demand. People still need to reach the same amount of food as usual. For this reason, the decrease in the production of food products triggers volatility in the prices of products in the food market, and eventually, it jeopardizes food availability and access via economic crises⁴⁶⁹. FAO highlights that trade has a huge part in balancing the supply and demand of food in terms of production and consumption patterns⁴⁷⁰. Trade is especially involved as a fundamental part of food supply and demand. It, therefore, has many implications for food availability. These effects vary from the access of agricultural products to other markets to shaping the economies of countries. It has a key place in terms of providing the basic income of the countries and the producers. Likewise, attention should be drawn to the issue of access to food for populations suffering from hunger and malnutrition. Yet, trade does not fully ensure access to food in every corner of the world. However, it needs to be noted that the impacts of trade on countries also can be diverse. In the case of China, it has become an importer of many food products and has grown its economy even though the 2007 food crisis created negative effects globally⁴⁷¹. On the contrary, North Africa started to import many products as they could not meet the increasing demand in food production, and the volatility in food

⁴⁶⁸ Adam Prakash and Christopher L. Gilbert, "Rising vulnerability in the global food system: beyond market fundamentals". In *Safeguarding food security in volatile global markets* (2011): 42–63.

⁴⁶⁹ Ibid.

⁴⁷⁰OECD-FAO, "Agricultural Outlook 2021-2030". 2021, <u>https://doi.org/10.1787/19428846-en</u>.

⁴⁷¹Ibid.

prices caused major economic problems in the region. It can enhance the quantity and several types of food with import and, thus, it can lead other countries to compete in global markets based on types of food⁴⁷². The developing countries can become involved in the global market and attract investors' attention to the region for more production. As a result of market access by exports, the incomes of people who depend on agricultural production for their livelihood are likely to increase. It also helps boost employment and increases the incomes of the household. For instance, Madagascar's rice production levels started to reach about 70 percent right after its exports to Europe⁴⁷³. Nevertheless, if food prices remain volatile in the global market, producers can go for more export which can damage food availability in the domestic market. The domestic producers can also diminish agricultural production as they cannot compete with imports. In some regions, producers can leave their agricultural livelihood and try to find a new job for better income⁴⁷⁴. Accordingly, producers who cannot provide an income due to the abandonment of agricultural activities can migrate to the cities and cause irregular population growth in cities. Furthermore, the integrated global market is easily affected by any trade limitations or barriers. For example, while India was trying to restrain the price volatility in the domestic market, the export restrictions it applied revealed the volatility in the global market. Considering that India's rice export share is in the first place, the instability caused by trade barriers in exporting countries, especially low-income countries, is inevitable⁴⁷⁵. In these countries, the agricultural sector is characterized by more small producers with less access to finance, limited technological capacity, and a low level of investments. By comparison, in developed countries where investment in agricultural R&D is more than 50 percent on a private-sector basis, the same investments are seen at only 8.1

⁴⁷⁴ Ibid.

⁴⁷²Ibid.

⁴⁷³ FAO, "The State of Agricultural Commodity Markets", (Rome: FAO, 2018).

⁴⁷⁵ George Rapsomanikis, "Price transmission and volatility spillovers in food markets". In A. Prakash (Ed.), *Safeguarding food security in volatile global markets*, (Rome: FAO,2011) 144–171.

percent in developing countries⁴⁷⁶. They have fragile economies that are even more vulnerable to volatility. According to Lanfranchi et al., the developed countries have been affected in a lesser way by economic problems. Even if most populations in developed countries spend half their budget on food, economic action is taken quickly to adjust for the unexpected times, and their sphere of influence is quite flexible. These countries also have mechanisms that can enable them to manage economic problems more functionally⁴⁷⁷.

5.3. Environmental Challenges for Food Security and Agriculture

Climate change and its effects are among the issues that most concern food security and the agricultural sector and remain substantial. Climate change emerges because it affects the various stages of the food system and the dimensions of food security and puts the issues such as proper temperature, rich soil, and enough water required by agricultural production at risk.⁴⁷⁸ Climate change has increased its effects globally and regionally in recent years. The conditions that the agricultural sector needs to feed the growing population with sufficient and nutritious foods in a sustainable way are turning into a phenomenon. Thus, the scarcity of earth resources gradually increases the burden on the agricultural sector⁴⁷⁹. Moreover, the place of water in the food system is important for the growth of food products. The ever-increasing demand for

⁴⁷⁶ Sisira Jayasuriya, et al."Food price spikes, increasing volatility and global economic shocks: coping with challenges to food security in Asia". (Bangkok: FAO, 2012).

⁴⁷⁷ Maurizio Lanfranchi, el al. "Economic and social impacts of price volatility in the markets of agricultural products". *Bulgarian Journal of Agricultural Science*, 25, no.6, (2019) 1063–1068.

⁴⁷⁸ John Lienhard et al. "Climate Change, Agriculture, Water, and Food Security: What We Know and Don't Know," 2019.

⁴⁷⁹ Ibid.

food brings to light the security problems of limited resources, and for this reason, it needs to be emphasized that it is necessary to take steps for the effects of climate change to meet the increasing food demands. In this sense, dimensions of food security have been more complex with the increasing effects of climate change, triggering the need for joint actions towards these problems in regional and global terms⁴⁸⁰. For this reason, the delicate balance between food security and climate change is important to prevent global and regional problems by mitigating their effects and increasing resilience or adaptation.

Climate change and its effects continue to emerge as a major environmental problem that endangers the world⁴⁸¹. These effects will deepen as the human activities at the center of these problems continue in an increasingly destructive way. Particularly, the accumulation of greenhouse gases (GHG) in the atmosphere causes global temperatures to rise, and weather events become unstable, leading to extreme results such as drought and floods⁴⁸². According to the IPCC, the surface temperatures that increased by 0.85 °C between 1880 and 2012 created remarkable stress on natural resources⁴⁸³. Agricultural land and water resources, which are the main natural resources for human life, are highly exposed to the effects of climate change. In that regard, rising temperatures have direct and indirect negative effects on agricultural production and water resources⁴⁸⁴. On the other hand, these effects differ according to

⁴⁸⁰ IPCC, "Climate change 2014: Synthesis Report", ed. Rajendra K. Pachauri and Leo Meyer (Geneva: IPCC, 2014) 1-151.

⁴⁸¹I.M. Azare et al., "Deforestation, Desert Encroachment, Climate Change and Agricultural Production in the Sudano-Sahelian Region of Nigeria," *Journal of Applied Sciences and Environmental Management* 24, no. 1 (2020): p. 127

⁴⁸²OECD, "Integrating Climate Change Adaptation into Development Co-Operation: Policy Guidance," (Paris: OECD Publishing, 2009) p.14

⁴⁸³ IPCC, "Climate change 2014: Synthesis Report", ed. Rajendra K. Pachauri and Leo Meyer (Geneva: IPCC, 2014) 1-151.

⁴⁸⁴ Massimiliano Agovino et al., "Agriculture, Climate Change and Sustainability: The Case of EU-28," *Ecological Indicators* 105 (2019): pp. 525-543

various regions. Increases in annual precipitation in arid regions can be important in terms of agricultural production, while productivity and diversity can decrease as floods or excessively moist soil can occur in water-abundant areas⁴⁸⁵. Considering agricultural production and climate change, the existence of a mutual effect is striking. This causes adverse effects on climate change in the chain of food systems, while climate change affects agricultural production for several reasons and puts the dimensions of food security in danger.

The agricultural sector is controlled by people and changed according to the conditions of space and time by various means and ways. Although the soil and the crop exist naturally, it is the people who are seeding, harvesting, and reaching them to the plate⁴⁸⁶. On the other hand, the increase in the effects of climate change causes this process to be negatively affected. This negativity can reduce agricultural productivity and affect food security. It is seen that food security is affected in economic and social dimensions as well as the negative effects on the household, regional/country, and global levels. At the household level, production costs may increase as producers of food are exposed to the effects of climate change, which may lead to an increase in food prices. As discussed in the previous section, these economic problems have major consequences. It shows that agricultural production is the area that will be most affected by the increasing intensity and frequency of the negative effects of weather conditions caused by climate change ⁴⁸⁷. Considering that 50% of the world's land is used for agriculture and agricultural activities⁴⁸⁸, the effects of climate change may cause major food problems on a global scale. Besides, according to Malhi et al., there

⁴⁸⁵ Ibid.

⁴⁸⁶Deepika Pandey, "Agricultural Sustainability and Climate Change Nexus," in *Contemporary Environmental Issues and Challenges in Era of Climate Change*, ed. Pooja Singh (Springer, 2020), pp. 1-293.

⁴⁸⁷ FAO, "Coping with climate change – the roles of genetic resources for food and agriculture." (Rome:FAO, 2015).

⁴⁸⁸ Chinaza Awuchi et al., "Environmental Impacts of Food and Agricultural Production: A Systematic Review". *European Academic Research*, 8, no.2:(2020) 1-16.

will be more extreme temperatures, droughts, and heavy rains to be witnessed⁴⁸⁹. It has been emphasized that precipitation will be more effective, especially in the South and East Asia region. Hence, it causes negative consequences such as erosion and damage to agricultural products with the accumulation of increased precipitation in the soil. Likewise, attention is drawn to the possibility of higher temperatures in the northeastern regions of the USA⁴⁹⁰. Various consequences such as increased salinity or heat stress on the crops are triggered by the deterioration of the soil in regions where drought occurred. The output to be obtained from the crops here can decrease with the deterioration of the soil. At the regional/national level, climate change creates a wideranging crisis in countries where most of the population earns their income from the agriculture and food sectors. These crises deepen with the inability to provide employment, the abandonment of producers from the lands, or the decrease in agricultural production⁴⁹¹. That is why countries need to consider outcomes and provide policies, strategies, and government programs to deal with them. At the global level, the food supply can be triggered by these crises and cause economic and sociopolitical consequences that can be experienced on a large scale. It is necessary to increase the agricultural production capacity, which is foreseen to meet the food needs of the world by 2050, by more than 60 percent⁴⁹². Moreover, South Asia and Sub-Saharan Africa, where most of the world's hungry and poor populations are located, do not have access to nutritious and sufficient food. Especially, the decreases in agricultural production have resulted from the increase in the effects of climate change,

⁴⁸⁹ Gurdeep Singh Malhi, Manpreet Kaur, and Prashant Kaushik, "Impact of Climate Change on Agriculture and Its Mitigation Strategies: A Review," *Sustainability* 13, no. 3 (2021): p. 1318

⁴⁹⁰ Ibid.

⁴⁹¹ FAO, "Coping with climate change – the roles of genetic resources for food and agriculture." (Rome:FAO, 2015).

⁴⁹² Nikos Alexandratos and Jelle Bruinsma, "World agriculture towards 2030/2050: the 2012 revision". (Rome: FAO, 2012): pp. 03-12.

fragile markets, and resource deficiencies⁴⁹³. In addition, some studies predicted that climate change would create favorable weather conditions for some regions. On the other hand, it is stated that the changes to be made in the production capacity of these regions will not have major effects on the global scale but may only create positive regional results⁴⁹⁴.

Food production is also responsible for a quarter of GHG emissions globally⁴⁹⁵. The food system chain is all contributing to the emissions. This creates a major problem as people need to eliminate the effects of climate change on agriculture, but the agricultural sector also needs to be decarbonized. Furthermore, direct emissions are derived from agricultural production, and it is not only from crops but also from manuring and the usage of machines for harvest. In the food system, there need to be energy resources for heating, transportation, packaging, and food processing. Thus, 18% of emissions arise from the supply of food⁴⁹⁶. Therefore, the emissions become a key challenge for reducing the climate change effects for countries. Climate change has already presented a complex structure as it affects food systems and food security in several ways, as well as the food system causing carbon emissions that trigger climate change.⁴⁹⁷

Similarly, the impacts of climate change have increasingly posed a danger to water⁴⁹⁸. Water should be emphasized as a basic product both for the survival of people and for

⁴⁹⁶ Ibid. p.11

497 Ibid. p.10

⁴⁹³ Anil Kumar Misra, "Climate Change and Challenges of Water and Food Security," *International Journal of Sustainable Built Environment* 3, no. 1 (2014): pp. 153-165

⁴⁹⁴ Ibid.

⁴⁹⁵ Chinaza Awuchi, et al., "Environmental Impacts of Food and Agricultural Production: A Systematic Review". *European Academic Research*, 8, no.2:(2020) 1-16.

⁴⁹⁸ Munir A. Hanjra and M. Ejaz Qureshi, "Global Water Crisis and Future Food Security in an Era of Climate Change," *Food Policy* 35, no. 5 (2010): pp. 365-377.

the realization of agricultural production. In addition to being necessary for all living things, water is used in various fields such as sanitization. For this reason, considering the importance of water, negative effects on the water bring crises. In addition to the increasing demand for water day by day, it is worrying that water is overlooked as a limited resource and that there is already water scarcity in various parts of the world. It is stated that until 2025, the number of people exposed to water scarcity will increase because of population growth and climate change⁴⁹⁹. It occupies a large place to ensure the growth of agricultural products or to provide food security due to its versatile uses in the food system.

The importance and the management of water resources have been prominent since the earliest civilizations, so people settled near water or wet areas to do agriculture and meet their basic needs⁵⁰⁰. This is significant for the protection of water resources. These interactions, dating back to the earliest times of humanity, are shaped and affected by phenomena such as climate change today. According to Gordon et al., water is an essential element in the global area, given the size of agricultural land in the world. In addition to the use of water in agricultural land, the changing precipitation and temperature regimes with the effect of climate change also become prominent⁵⁰¹. As irrigation constitutes almost 70% of the water used in agricultural production⁵⁰², it brings with it a great challenge in terms of ensuring food security and the continuity of resources. Irregular use of limited water resources will have ecological consequences as well as jeopardize the future quantity and quality of water. However, climate change negatively affects both the quantity and quality of water⁵⁰³. According

⁵⁰³ Ibid. p.514

⁴⁹⁹ Ibid.

⁵⁰⁰ Anil Kumar Misra, "Climate Change and Challenges of Water and Food Security," *International Journal of Sustainable Built Environment* 3, no. 1 (2014): pp. 153-165.

⁵⁰¹Line J. Gordon, C. Max Finlayson, and Malin Falkenmark, "Managing Water in Agriculture for Food Production and Other Ecosystem Services," *Agricultural Water Management* 97, no. 4 (2010): pp. 512-519.

⁵⁰² Ibid. p.513
to the evaluation report of the Intergovernmental Panel on Climate Change (IPCC), it is stated that in addition to the effects of climate change, water resources will face the danger of depletion by using them in more areas, together with phenomena such as rapid population growth and urbanization⁵⁰⁴. In particular, the increasing use of water at all stages of the food system to meet the food demands of the growing population will affect the extent of the stress on water resources. In addition, there are studies in which water scarcity problems occur because of the water consumed in agricultural production⁵⁰⁵. These studies are based on data obtained as a result of general or regional/country level measurements on certain food products. When Brauman et al. studies are examined, it is seen that the water used in the production of sixteen basic foods, such as wheat, maize, and sunflower, and the water efficiency were analyzed⁵⁰⁶. In particular, the tonnage shares of these sixteen food products in the total crop produced in the world is 56%, while they reach 68% of the total cultivated land, and 65% of the crops constitute water consumption⁵⁰⁷. It is also noteworthy that this study is conducted in areas where there is already water scarcity. By dividing these areas into twenty climate zones specifically, water consumption and productivity under different climates were examined. As a result of the study, irrigated water was used for wheat and rice in arid regions, while rainwater was sufficient for millet and sorghum. In semi-arid or humid regions, wheat, rice, and maize led to the use of irrigation water significantly. The study also highlights that food crops in all regions

⁵⁰⁴ IPCC, "Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability", (Cambridge: IPCC, 2014) pp. 1-32.

⁵⁰⁵ Malin Falkenmark and Mats Lannerstad, "Consumptive Water Use to Feed Humanity – Curing a Blind Spot" 9, no. 1 (2004), pp. 15-28; See also: Johan Rockström, Mats Lannerstad, and Malin Falkenmark, "Assessing the Water Challenge of a New Green Revolution in Developing Countries," *Proceedings of the National Academy of Sciences* 104, no. 15 (October 2007): pp. 6253-6260.

⁵⁰⁶ Kate A Brauman, Stefan Siebert, and Jonathan A Foley, "Improvements in Crop Water Productivity Increase Water Sustainability and Food Security—a Global Analysis," *Environmental Research Letters* 8, no. 2 (2013): p. 024030.

⁵⁰⁷ Ibid. p.2

consume 82% of irrigation water in total in areas with limited rainfall during growth, development, and harvest⁵⁰⁸. Moreover, when the crop yield of water was examined, it was determined that maize grown in Sub-Saharan Africa was less calorically productive than that of Northern China. Considering that the grown crops are fed from both irrigation water and rainwater, it is concluded that the crops grown in areas with low rainfall are less productive. In this respect, the productivity of products increases in climate/tropical regions where regular precipitation occurs. As can be seen, considering the fact that the water required for growing crops varies by region and the different effects of climate change on different regions, appropriate water management strategies should be developed for the regions. Thus, the storage of rainwater or the development of irrigation methods suitable for the climate and crops in the region contribute to increasing the yield of food and reducing water stress.

Moreover, food security and water will face challenges in the future because of wideranging climate change issues. In order to produce adequate and nutritious food, the availability and quality of water are substantial. Although the importance of water varies according to regions and times, it is a key phenomenon for ensuring food security in a country. On the other hand, the fact that sufficient water can be supplied to ensure economic development and increase agricultural production capacity with population growth causes excessive pressure on the environment⁵⁰⁹. Especially in regions where poverty and hunger deepen, the availability of water and food carries great risks with the effects of climate change. Balasubramanya et al. draw attention to the creation of favorable conditions by referring to the relationship between water, agriculture, and poverty⁵¹⁰. Emphasis has been made on food security and water problems already experienced in areas where poverty is the majority. In addition, it is

⁵⁰⁸ Ibid.

⁵⁰⁹ E. Fereres, F. Orgaz, and V. Gonzalez-Dugo, "Reflections on Food Security under Water Scarcity," *Journal of Experimental Botany* 62, no. 12 (2011): pp. 4079-4086

⁵¹⁰ Soumya Balasubramanya and David Stifel, "Viewpoint: Water, Agriculture & Poverty in an ERA of Climate Change: Why Do We Know so Little?" *Food Policy*, 93, (2020)

emphasized that the safety and health problems that will arise due to the effects of poverty on water and food due to several reasons are clearly revealed⁵¹¹. For example, in developing countries where the poor population is at high levels, problems such as the inability to respond quickly to extreme weather conditions, insufficient crop production, and insufficient water used in agricultural production may occur. In line with this information, the impact of climate change on food security and water resources needs to be covered, and steps should be taken in regions/countries and globally. At the same time, regionally effective strategies can be determined with the spread of climate-smart agriculture practices. In this respect, Mancosu et al. emphasize that the amount of water required should be calculated by observing the effects of climatic conditions on the crops⁵¹². It helps reduce stress on both the soil and the water source by using the most reasonable amount of water for crops that need irrigation. Thus, the manufacturer not only produces crops at a lower cost but also contributes to the environment with climate-friendly practices. For example, thanks to the drip irrigation method, have contributed to the 25% more efficient use of water, especially in the South Asian region, and has helped to increase the yield in wheat production⁵¹³. Finally, effective management of water resources is important for agricultural lands and food systems to capture this cooperation⁵¹⁴. Determining adaptation and mitigation options and climate-appropriate technologies by evaluating risks and safety reasons is a crucial element in terms of food security and water.

⁵¹¹ Ibid.

⁵¹² Noemi Mancosu et al., "Water Scarcity and Future Challenges for Food Production," *Water* 7, no. 12 (October 2015): pp. 975-992

⁵¹³ M.L. Jat et al., "Climate Change and Agriculture: Adaptation Strategies and Mitigation Opportunities for Food Security in South Asia and Latin America," *Advances in Agronomy*, 2016, pp. 127-235

⁵¹⁴ Line J. Gordon, C. Max Finlayson, and Malin Falkenmark, "Managing Water in Agriculture for Food Production and Other Ecosystem Services," *Agricultural Water Management* 97, no. 4 (2010): pp. 512-519

5.4. Technical Challenges for Food Security and Agriculture

For hundreds of years, people have been able to develop and produce crops through several ways, experiences, experiments, and observations and, thus, live with the food they have obtained⁵¹⁵. Countries started to increase their agricultural products day by day in response to their increasing population, and they exported or imported from other countries through trade routes. The global population increased day by day, and the hungry population continued to increase in parallel. For this reason, the stress on the agricultural sector has become another issue of food security and technical diversification in production. In this respect, a challenge arose for countries to produce healthy and nutritious food that would be sufficient for the growing population. To overcome this difficulty, "the Green Revolution" developed in the light of scientific developments and aimed to increase the interest in the agricultural and food production capacity on a global scale in the period from the 1940s to the 1970s. To achieve this increase, mechanized agriculture and efficient irrigation systems have become widespread, but also large-scale artificial fertilizers and toxic pesticides have increased⁵¹⁶. Thanks to the Green Revolution, wheat production increased seven times annually between 1960 and 2006⁵¹⁷. In addition, studies have become more frequent to increase the importance of technology in production. After scientists in the 1940s enabled the transfer of genetic material between species, genetically modified

⁵¹⁵ J. Dutta, "Genetically Modified (GM) Foods: The Food Security Dilemma," *Food Safety in the 21st Century*, 2017, pp. 507-514.

⁵¹⁶ I. Ortiz-Monasterio et al., "Greenhouse Gas Mitigation in the Main Cereal Systems: Rice, Wheat and Maize.," *Climate Change and Crop Production*, 2010, pp. 151-176.

⁵¹⁷ J. Dutta, "Genetically Modified (GM) Foods: The Food Security Dilemma," p. 507.

organisms (GMOs) were introduced in the 1980s and commercialized in 1996⁵¹⁸. However, the green revolution has also faced criticism from various angles. Some regions fell into trouble because the methods applied to increase production capacity were not region-specific. The spread of large farms or landowners also created major problems for small producers in the region. Small producers, who could not cope with the use of machinery by large producers, either started to mechanize by borrowing or left their lands to turn to other sectors and migrate⁵¹⁹. In this respect, it led to unemployment and economic losses in rural areas. In addition, in some regions, because of incorrectly applied methods and the instability of the use of chemicals, environmental problems such as soil degradation and water pollution have increased. Yet, the increases in production via Green Revolution seen during this period still failed to end global hunger and poverty⁵²⁰.

Considering the economic and environmental challenges of food security, the need for boosting agricultural growth and sustaining nutritious and sufficient food for everyone has created searching for new paths and dilemmas for producers as well as consumers. One of them is genetic engineering solution for using biotechnology that creates genetically modified organisms, and the other way is the usage of production skills and improvements for organic⁵²¹. It needs to be stressed that both ways of production technics would raise solutions for food security. The solution to a rising population, environmental degradation, climate change impacts, and global economic crises

⁵¹⁸ Aditya Kumar Jha, Khushbu Kumari, and Kuldeep Bauddh, "Ecological Consequences of Genetically Modified Crops on Soil Biodiversity," in *Ecological and Practical Applications for Sustainable Agriculture* (Singapore: Springer, 2020), pp. 89-106.

⁵¹⁹ Hossein Azadi and Peter Ho, "Genetically Modified and Organic Crops in Developing Countries: A Review of Options for Food Security," *Biotechnology Advances* 28, no. 1 (2010): pp. 160-168

⁵²⁰ Ibid.

⁵²¹Mikhail A. Golubkov and Valentine Y. Myagkov, "GMO-Based or Organic Agriculture: What Choice Might Be Better for Food Security in the Long-Term Perspective? 2018, pp. 74-85

targets to reduce the pressure on agriculture and food security. Therefore, some scholars highlight the success and necessity of GMOs.⁵²² In comparison, others raise concerns about GMOs and suggest organic production as a better way of food security⁵²³. However, it should be noted that both have both positive and negative consequences.

Genetically modified is a technique that enables the transfer of a gene from a living cell to another living gene for a purpose through studies and developments in genetic engineering and biotechnology⁵²⁴. There are also various variations on these genes, such as duplications, replacements, and the creation of a new organism with different genes⁵²⁵. GM (genetically modified) food, especially in the 1990s, started to be commercialized and became widespread globally. During this period, GMOs were specified as first-generation genetic engineering. Accordingly, it consists of products formed by the random insertion of a gene or genes into another DNA. The main reason for making GMO technologies was to protect the crops against insects or diseases or to show resistance⁵²⁶. However, with the development of technology and scientific techniques, various developments followed, such as transferring the characteristics of different genes or genomes to other ones. This technology is specified as second-

⁵²⁶ Ibid.

⁵²²Sven-Erik Jacobsen et al., "Feeding the World: Genetically Modified Crops versus Agricultural Biodiversity," *Agronomy for Sustainable Development* 33, no. 4 (2013): pp. 651-662; David Wield, Joanna Chataway, and Maurice Bolo, "Issues in the Political Economy of Agricultural Biotechnology," *Journal of Agrarian Change* 10, no. 3 (2010): pp. 342-366

⁵²³ Terence E. Epule, "Contribution of Organic Farming towards Global Food Security," *Organic Farming*, 2019, pp. 1-16; S J Khan et al., "Genetically modified organisms (GMOs): Food security or threat to food safety" *Pakistan Journal of Science*, 64, no.2:(2012) pp. 85–92; Moussa Savadogo, "Environmental issues related to genetically modified crops in Africa". *Gates Open Res*, 2019.

⁵²⁴ David Wield, Joanna Chataway, and Maurice Bolo, "Issues in the Political Economy of Agricultural Biotechnology," *Journal of Agrarian Change* 10, no. 3 (2010): pp. 342-366

⁵²⁵ Ryan Whitford and Peter Langridge, "Biotechnology in Agriculture.," in *Climate Change* and Crop Production (CABI Climate Change Series, 2010), pp. 219-245.

generation genetic engineering and consists of a direct modification of the genes or genomes in DNA by editing. At the same time, changes are made to the RNA in the cell⁵²⁷. These changes made to DNA or RNA aim to increase the speed and efficiency of the production and processing of agricultural products. Thus, among the advantages of GMOs, the most basic argument for ensuring food security stands out as meeting the food supply of the increasing global population. It is stated that from 1996 to 2016, it was cultivated on 185 million hectares of land with the global spread of GMOs agriculture⁵²⁸. GM food, which is conducted on a very commercial scale by twentysix countries, starts in various geographies such as Brazil, Argentina, and India, especially the USA⁵²⁹. In the USA, around 90% of the cultivated areas of corn, cotton, and soy crops are produced with GM⁵³⁰. However, the order of GM crops in the world is unstable. As there is no distinction between North and South, it continues to be applied frequently in developing and developed countries. On the other hand, European countries and the EU have not adopted the production or cultivation of GMOs products, and it is seen that strict rules are adopted in European markets⁵³¹. However, the importance of GMOs products is emphasized in terms of ensuring the availability and stability of food security. Extreme weather conditions and harmful insects that cause stress and losses of food products can be prevented by biotechnology. In this way, damage to the crop is minimized, and more production is

⁵²⁷Katharina Kawall, Janet Cotter, and Christoph Then, "Broadening the GMO Risk Assessment in the EU for Genome Editing Technologies in Agriculture," *Environmental Sciences Europe* 32, no. 1 (November 2020)

⁵²⁸ Mikhail A. Golubkov and Valentine Y. Myagkov, "GMO-Based or Organic Agriculture: What Choice Might Be Better for Food Security in the Long Term Perspective? 2018, pp. 74-85

⁵²⁹ Ibid.

⁵³⁰ ISAAA. "92% cotton, 90% corn areas in the US produced with GE Seeds. Crop Biotech Update".<u>https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=18209</u> (accessed on May 4, 2022)

⁵³¹ David Wield, Joanna Chataway, and Maurice Bolo, "Issues in the Political Economy of Agricultural Biotechnology," *Journal of Agrarian Change* 10, no. 3 (2010): pp. 342-366

provided. The disadvantages of the crops produced in traditional ways against sudden temperatures, colds, or extreme weather conditions are again increased by the genomes added to their genetics. Thus, the preservation of the availability of the products can be ensured. Furthermore, it is underlined that traditional agriculture occupies more cultivated land, but the yield with GM production can make more products in a shorter time⁵³². It becomes an effective and sustainable technique. Also, it reduces the use of pesticides and the damage to the environment. Reducing harmful pesticides is also an essential element of ensuring human health and food safety⁵³³. Moreover, it is aimed to increase crop quality. Improvements are made by increasing the nutritional quality by adding useful vitamins, proteins, or fats that are missing or absent from the crops. For example, a type of rice, so-called Golden Rice, is enriched with vitamin A^{534} . Another advantage is that it provides economic benefits to developing countries. Considering that it varies according to different regions and countries or different crops, it is highlighted that the incomes of producers producing GMOs products may be positively affected. Among the economic benefits, the long shelf life of GMOs products and high efficiency is remarkable for ensuring food security in this respect. Also, the producers do not spend their income on chemicals, and it is a contribution to them. In addition, it provides an increase in income by creating employment for people working in fields such as harvesting, planting, and transporting GMOs products. Considering that GM crops that grow faster are reproduced many times a year, the

⁵³² Sven-Erik Jacobsen et al., "Feeding the World: Genetically Modified Crops versus Agricultural Biodiversity," *Agronomy for Sustainable Development* 33, no. 4 (2013): pp. 651-662

⁵³³ Fatemeh Taheri, Hossein Azadi, and Marijke D'Haese, "A World without Hunger: Organic or GM Crops?" *Sustainability* 9, no. 4 (November 2017)

⁵³⁴ Marta Kramkowska, Teresa Grzelak, and Krystyna Czyżewska, "Benefits and risks associated with genetically modified food products," *Annals of Agricultural and Environmental Medicine*, 20, no.3 (2013): 413–419

wages paid to the working people can similarly increase⁵³⁵. It was emphasized that there was an economic return of 17.7 billion dollars in 2014 from GM production⁵³⁶.

Conversely, it is also seen that there are increasing political-economic, environmental, and public concerns regarding GMOs production. Despite the global economic gains and increasing cultivated areas, it is frequently protested by opposing groups in many countries of the world, especially in Europe. These protests are also reflected in policy areas, and restrictions are imposed on the trade or cultivation of GMOs products in developing countries. Regulations on GMOs products, which are a major obstacle for developing countries to enter the EU market, create a great deterrent⁵³⁷. In this respect, the contents of food products that will enter the market are controlled by the EU labeling and monitoring regulations. GMOs risk analyzes and evaluations are carried out by the European Food Safety Authority (EFSA) on groups such as feeds, animal drugs, seeds as well as food products⁵³⁸. Furthermore, the demand for "clean and safe" food products is frequently increasing in European countries, so it is a driving force for other countries not to adopt GMOs products in terms of their access to European markets and their economic concerns. Furthermore, another economic problem is that large companies monopolize GMOs products⁵³⁹. The commercialized GM seed is delivered to the farmer through an agreement signed with the company that obtained

⁵³⁵ Asad Riaz, Umer Karamat, and Javaria Tabusam, "Benefits of Genetically Modified Crops, Biosafety Concerns and Related Risks; A South Asian Perspective," *Nature and Science* 16, no. 9 (2018).

⁵³⁶ Ibid.

⁵³⁷ Hossein Azadi and Peter Ho, "Genetically Modified and Organic Crops in Developing Countries: A Review of Options for Food Security," *Biotechnology Advances* 28, no. 1 (2010): pp. 160-168

⁵³⁸ Katharina Kawall, Janet Cotter, and Christoph Then, "Broadening the GMO Risk Assessment in the EU for Genome Editing Technologies in Agriculture," *Environmental Sciences Europe* 32, no. 1 (2020)

⁵³⁹ Hossein Azadi and Peter Ho, "Genetically Modified and Organic Crops in Developing Countries: A Review of Options for Food Security," *Biotechnology Advances* 28, no. 1 (2010): pp. 160-168

the patent for the GM seed. This agreement also includes penalties and prohibitions for improper use or violations. For this reason, a problem that can be experienced is that farmers may witness decreases in food production or deterioration in economic stability as a result of these penalties. This privatization and monopolization also make it difficult to reach areas that are already in poverty⁵⁴⁰. In addition to the possible penalties of this technology, the cost is also striking. For this reason, access to this technology may be less in poorer areas. In addition, a capacity is required to properly perform biotechnology-required assessments and controls. In this respect, it needs the necessary capacity for this technology to become widespread and used by producers in developing countries or poor regions. Another disadvantage is that with the increase in monopolies on GMOs products, food supply is provided only by companies with patents. This may result in reductions in diversity in production or volatility in stocks. For instance, GM crops are specifically applied to get higher yields specific to a single seed, thus causing less variety and offering less range for producers⁵⁴¹. For this reason, reasons such as the low variety of GM foods in poorer areas or high financial prices do not help ensure food security.

From an environmental point of view, besides the political and economic impacts of GM technology, there are concerns about environmental risks and hazards as well. The loss of biodiversity is seen as a top concern for GM crops⁵⁴². Worryingly, this situation is that in the long term, if GM crops are pollinated with other species, a new species may emerge. These are also called super-corps or super-weeds⁵⁴³. It is discussed that

⁵⁴⁰ Mikhail A. Golubkov and Valentine Y. Myagkov, "GMO-Based or Organic Agriculture: What Choice Might Be Better for Food Security in the Long Term Perspective? 2018, pp. 74-85

⁵⁴¹ S J Khan et al., "Genetically modified organisms (GMOs): Food security or threat to food safety" *Pakistan Journal of Science*, *64*, no.2:(2012), 85–92.

⁵⁴² Fatemeh Taheri, Hossein Azadi, and Marijke D'Haese, "A World without Hunger: Organic or GM Crops?" *Sustainability* 9, no. 4 (November 2017): p. 580

⁵⁴³ Rabiul Islam et al., "Assessment of the Effects of Genetically Modified (GM) Foods: A Brief Study on Health and Environmental Concerns," *Journal of Materials and Environmental Science* 11, no. 10 (2020): pp. 1676-1688.

these may pose a great danger to natural life because these powerful species that may emerge can cause reductions in the natural ecosystem and crop yield, as they will be more durable in the habitat of other crops. Moreover, while adding or increasing the basic nutritional values of genetically modified crops, they can also change other unpredictable nutritional values⁵⁴⁴. In this respect, there is a gap in the consequences of varying nutritional values. It is inevitable that food safety issues are also included here. Problems such as allergenicity, carcinogen content, and toxicity may occur in foods that have been manipulated with nutritional values. Although GMOs technology reduces the use of pesticides, it creates a safety problem in this respect⁵⁴⁵. Additionally, there are concerns over its long-term impact on the ecosystem. The contributions of beneficial microorganisms and various insect species in the ecosystem are important for food production. It has great functions in terms of destroying the useless substances in the soil where the crops are grown, increasing the fertility of the soil naturally, and providing benefits to the plants by pollination. Although GM technologies aim to increase resistance against harmful insects or microorganisms, it is argued that beneficial microorganisms or insects will not be completely affected⁵⁴⁶. For this reason, problems may occur in the food chain in ecosystems where GM crops are added. For instance, a species that feeds on insects in the target group is likely to be affected in the field of potentially GM crops. In addition, the fact that such cases do not occur with field studies on a regional basis creates a lack of information and constitutes a criticism of the laboratory-oriented progress of GM technology.

⁵⁴⁴ Ibid.

⁵⁴⁵ J. Dutta, "Genetically Modified (GM) Foods: The Food Security Dilemma," *Food Safety in the 21st Century*, 2017, pp. 507-514.

⁵⁴⁶ Aditya Kumar Jha, Khushbu Kumari, and Kuldeep Bauddh, "Ecological Consequences of Genetically Modified Crops on Soil Biodiversity," in *Ecological and Practical Applications for Sustainable Agriculture* (Singapore: Springer, 2020), pp. 89-106.

Another food production technique in terms of ensuring food security should be stated as "organic agriculture."547 Considering its advantageous and positive effects, its social, economic, and environmental dimensions become prominent, but organic agriculture also has disadvantages. Its social contributions require an intensive work program in various aspects due to the nature of organic agriculture. Thus, long-term employment and the benefits it provides, especially for rural development, are key factors⁵⁴⁸. It also brings together the cultivation of organic products to people in rural areas and an effective entrepreneurship opportunity with the sales of these products. It needs to be emphasized that migration to cities will lose its importance thanks to the increase in the incomes of people engaged in organic agriculture. This is also beneficial to small producers and local farmers, who are affected by large production firms. According to Hossein and Peter, local producers have favorable conditions for them to switch to organic agriculture with a faster transformation thanks to their dominance of the environment they are currently in, but there are some problems when switching to organic agriculture⁵⁴⁹. They stressed that establishing organic production standards that need to be met in the transition phase can be costly. Since obtaining certificates and documents for organic agriculture sometimes takes a longer process, producers who cannot sell their products may have financial difficulties⁵⁵⁰. From an economic point of view, products produced without the use of chemicals or pesticides have lower costs. Especially for local producers and small farmers, organic products with high added value contribute to an increase in income overall. This can be attributed to research showing that organic farming yields 22% to 35% more profits than

⁵⁴⁷ Terence E. Epule, "Contribution of Organic Farming towards Global Food Security," *Organic Farming*, 2019, pp. 1-16

⁵⁴⁸ Laleh Morshedi and Farhad Lashgarara, "The Role of Organic Farming for Improving Food Security from the Perspective of Fars Farmers," *Sustainability* 9, no. 11 (2017)

⁵⁴⁹ Hossein Azadi and Peter Ho, "Genetically Modified and Organic Crops in Developing Countries: A Review of Options for Food Security," *Biotechnology Advances* 28, no. 1 (2010): pp. 160-168

⁵⁵⁰Eva-Marie Meemken and Matin Qaim, "Organic Agriculture, Food Security, and the Environment," *Annual Review of Resource Economics* 10, no. 1 (May 2018): pp. 39-63

conventional farming⁵⁵¹. In particular, the increasing demands for organic products in the European market also affect the interest in organic production. Thus, for developing countries, the continuity of relations with this market can be a key factor for sustainable organic agriculture. However, the issue that should not be overlooked here is that while high-income consumers in developed countries tend to pay high prices for organic products, buyers may not be found in the domestic market in developing countries because poor or low-income consumers who already spend most of their income on food may not be a priority to purchase organic products⁵⁵². Furthermore, in places where there are technological limits and less efficiency in production, turning to organic agriculture may provide fewer benefits to the producer. For this reason, it is important for producers who want to gain economic gains to follow development projects or financial support from governments while turning to organic agriculture.

From another point of view, it is stated that local producers or small-scale farmers will not completely eliminate poverty levels, or high profits will not occur in a brief time⁵⁵³. The environmental benefits of organic agriculture on soil quality, low levels of environmental damage, and a sustainable method for future generations are significant. Organic production, which is done naturally without pesticides in its content, provides a wide range of benefits from soil to water, from microorganisms to humans, and shows significant improvements in terms of food security⁵⁵⁴. It is a crucial element for food safety, thanks to the removal of harmful substances from foods. Moreover, it should be noted that antioxidants and minerals in organic foods are of higher quality,

⁵⁵¹ David W. Crowder and John P. Reganold, "Financial Competitiveness of Organic Agriculture on a Global Scale," *Proceedings of the National Academy of Sciences* 112, no. 24 (2015): pp. 7611-7616

⁵⁵² Eva-Marie Meemken and Matin Qaim, "Organic Agriculture, Food Security, and the Environment," *Annual Review of Resource Economics* 10, no. 1 (May 2018): p.53

⁵⁵³ Ibid. p.54

⁵⁵⁴ Laleh Morshedi and Farhad Lashgarara, "The Role of Organic Farming for Improving Food Security from the Perspective of Fars Farmers," *Sustainability* 9, no. 11 (2017)

according to a study⁵⁵⁵. On the other hand, the most critical criticism is that organic agriculture may lack the production that can be enough for the increasing population⁵⁵⁶. In the framework that almost 1.5% of the cultivated land in the world is organic agriculture, so it is a matter of discussion to be able to meet enough food only with organic agriculture⁵⁵⁷. In this respect, it is expected that organic agriculture will spread to more soil in the world and reach the level of traditional agriculture. It could result in either the conversion of existing traditional farmland or the destruction of forests within the ecosystem to create more organic farmland for a growing global population. However, in both cases, quite net losses can be given in terms of environmental and economic aspects. Again, it can differ in regions and for crops. In this respect, organic agriculture in some regions produced higher yields than traditional agriculture, while it remained lower in other regions⁵⁵⁸. Additionally, the crops of organic agriculture that emerge in a long time with less yield are seen as a disadvantage, even though they contribute significantly to the environment and human health. Even some large agribusiness operators and global companies criticize organic agriculture because they prioritize their own income with the idea that more production will result in greater efficiency. Thus, putting organic agriculture into the background by global companies can be another issue.⁵⁵⁹

⁵⁵⁵ Denis Lairon, "Nutritional Quality and Safety of Organic Food. A Review," Agronomy for Sustainable Development 30, no. 1 (2010): pp. 33-41.

⁵⁵⁶ Eva-Marie Meemken and Matin Qaim, "Organic Agriculture, Food Security, and the Environment," *Annual Review of Resource Economics* 10, no. 1 (May 2018): pp. 39-63

⁵⁵⁷ FiBL & IFOAM - Organics International, "The World of Organic Agriculture," 2021 ⁵⁵⁸ Fatemeh Taheri, Hossein Azadi, and Marijke D'Haese, "A World without Hunger: Organic or GM Crops?" *Sustainability* 9, no. 4 (November 2017): p. 580.

⁵⁵⁹ Hossein Azadi and Peter Ho, "Genetically Modified and Organic Crops in Developing Countries: A Review of Options for Food Security," *Biotechnology Advances* 28, no. 1 (2010): pp. 160-168,

5.5. Challenges of COVID-19 and Ukraine-Russia War for Food Security and Agriculture

The COVID-19 epidemic, which emerged in Wuhan, China, in 2019 and was declared a global pandemic by the World Health Organization, has had an impact on a wide range of areas such as food, health, and the economy⁵⁶⁰. Economic and social crises have emerged in all areas that the agricultural sector is directly or indirectly dependent on. As mentioned in the previous sections in this sector, there are various interconnected inputs in agriculture, which is an essential element of the food system. There are quite a few steps involved, from planting the seed to harvesting, packaging, processing, and transportation. For this reason, a pandemic such as COVID-19 has affected all of these stages more or less, causing disruptions or pauses. Although food systems differ from country to country, their effects are encountered by COVID-19⁵⁶¹.

The pandemic quickly affected food systems and primarily chains of closely interlocked food systems. According to Clapp, three main problems become significant⁵⁶². First, due to the rapid transmission of COVID-19 cases, states have taken measures to reduce or control the rate of spread. These included mandatory diagnostic tests, curfews, and measures such as social distancing⁵⁶³. Moreover, if a person tested positive, this person could return to normal life right after the test turned negative after a certain period in quarantine. During this period, people did not work,

⁵⁶³ Ibid. p. 1401

⁵⁶⁰ A. B. Indah et al., "A Review: Agricultural Production and Food Industry during Pandemic Covid-19," *IOP Conference Series: Earth and Environmental Science* 807, no. 2 (January 2021)

⁵⁶¹ Mehmet Çalışkan, Ayten Yagız, and Caner Yavuz, "The Impact of COVID-19 on Agriculture," *Post-COVID Economic Revival* 2 (2022): pp. 97-113

⁵⁶² Jennifer Clapp and William G. Moseley, "This Food Crisis Is Different: COVID-19 and the Fragility of the Neoliberal Food Security Order," *The Journal of Peasant Studies* 47, no. 7 (November 2020): pp. 1393-1417

especially those working in the food and agriculture system, causing disruptions. Moreover, restrictions or quarantine conditions in the pandemic pose a wide range of problems, as the labor force is significant in the agricultural sector and food system. In this respect, it has caused losses because of malfunctions of the products that need to be collected in a short time or the food products that need to be packaged without spoiling. It is seen that food security is threatened in conditions where this continuity in agricultural production and food system cannot be achieved⁵⁶⁴. Due to the pandemic conditions, workers' incomes in the agriculture and food sector may also decrease and make the food system more fragile. Developing countries, which have a large share of the agricultural sector in GDP, are highly exposed to the effect of the pandemic on their food systems. In these countries, it results in the lack of access to food due to disruptions in agriculture and food systems or increases in incomes. In addition, considering the tendency of people to buy more food than they normally would, with the effect of panic, disruption in the food system may cause stocks to be replenished and food products to be unavailable locally. As a result, the unavailability of food creates economic volatility by causing unaffordable prices⁵⁶⁵. Secondly, Clapp notes that as the recession caused by the pandemic becomes global, hunger and poverty will be affected in parallel⁵⁶⁶. The most crucial reason for this is the trade and travel restrictions imposed by the countries with the effect of the uncertain situation. Countries have followed the travel and commercial restrictions one after the other,

⁵⁶⁴ Glenn Gregorio and Rico Ancog, "Assessing the Impact of the COVID-19 Pandemic on Agricultural Production in Southeast Asia: Toward Transformative Change in Agricultural Food System," *Asian Journal of Agriculture and Development* 17, no. 1 (January 2020): pp. 1-14

⁵⁶⁵ A. B. Indah et al., "A Review: Agricultural Production and Food Industry during Pandemic Covid-19," *IOP Conference Series: Earth and Environmental Science* 807, no. 2 (January 2021)

⁵⁶⁶ Jennifer Clapp and William G. Moseley, "This Food Crisis Is Different: COVID-19 and the Fragility of the Neoliberal Food Security Order," *The Journal of Peasant Studies* 47, no. 7 (November 2020): pp. 1393-1417

considering their health priorities⁵⁶⁷. Trade restrictions have affected the food supply chain, causing disruptions all over the world. In addition, according to the FAO's report, COVID-19 has triggered an increase in the number of undernourished people⁵⁶⁸. Moreover, trade restrictions that emerged due to pandemic conditions have created great problems for import-dependent countries. Likewise, because of the restrictions made by large importing countries, this effect creates a lot of fragilities and threatens food security⁵⁶⁹. Finally, Clapp emphasized that the impact of the pandemic on food systems and agricultural production is unbalanced and varies from country to country with different dynamics from sector to sector⁵⁷⁰. For this reason, it should be noted that the pandemic has produced quite mixed results. The effects of the pandemic vary according to the way of life of consumers in both rural and urban areas or the fast and effective aid policies received by governments. The effects of COVID-19 on food security are quite asymmetrical in a framework where there are countries that have lost their workforce and effectively support the agriculture and food sector, as well as countries that have already been suffering from hunger and poverty⁵⁷¹.

Another factor is the impact of conflicts and wars on food security and agricultural production. It often poses a threat to food security due to the death of people caused

⁵⁶⁷ Vasilii Erokhin and Tianming Gao, "Impacts of Covid-19 on Trade and Economic Aspects of Food Security: Evidence from 45 Developing Countries," *International Journal of Environmental Research and Public Health* 17, no. 16 (October 2020)

⁵⁶⁸ FAO, "The State of Food Security and Nutrition in the World 2020". (Rome:FAO, 2020)

⁵⁶⁹ Vasilii Erokhin and Tianming Gao, "Impacts of Covid-19 on Trade and Economic Aspects of Food Security: Evidence from 45 Developing Countries," *International Journal of Environmental Research and Public Health* 17, no. 16 (October 2020) p.2

⁵⁷⁰Jennifer Clapp and William G. Moseley, "This Food Crisis Is Different: COVID-19 and the Fragility of the Neoliberal Food Security Order," *The Journal of Peasant Studies* 47, no. 7 (November 2020): pp. 1393-1417

⁵⁷¹ Vasilii Erokhin and Tianming Gao, "Impacts of Covid-19 on Trade and Economic Aspects of Food Security: Evidence from 45 Developing Countries," *International Journal of Environmental Research and Public Health* 17, no. 16 (October 2020) p.3

by wars, their displacement, and the destruction of structures⁵⁷². The main purpose of wars or conflicts involves winning the war by eliminating or stopping the "enemy." Because of this, battlefields or fronts are likely to form⁵⁷³. Moreover, people who engage in conflicts or have to leave their place cause disruption to the food system. For instance, problems such as the producers leaving their fields as a result of war or conflict, or the irrigation system not working because the infrastructure collapsed, may occur. Thus, disruptions in food production bring major problems as buyers cannot reach food and sellers cannot reach the market. The duration and extent of war or conflict can cause food security to intensify in parallel⁵⁷⁴. In addition, there can be an extent of mass migration as well. Eventually, those problems lead to the deterioration of agricultural production and the food system and increases in food prices. It increases the pressures on access to food by creating price volatility locally or globally. Ensuring the availability of food and stability are also at risk in this respect. Failure to provide food can create a regional and global crisis, and even if the war or conflict ends immediately, it takes time for the infrastructure or the damaged system to recover. In addition, the destruction of agricultural and food production areas or the deliberate collapse of infrastructure can be seen as a strategy in case of war to cut access to food against the enemy 575 .

Additionally, it should be noted that the Russian invasion of Ukraine, which emerged in the first half of 2022, affects global, regional, and individual levels and dimensions of food security. Primarily, both countries are in the top three global exporters of crops

⁵⁷² Alexander Segovia, "The relationships between food security and violent conflicts: The case of Colombia," (Rome: FAO, 2017) 06-17.

⁵⁷³ Slobodanka Teodosijevic, "Armed Conflicts and Food Security" (Rome: FAO, 2003) pp. 0-34

⁵⁷⁴ Birgit Kemmerling, Conrad Schetter and Lars Wirkus, "Addressing Food Crises in Violent Conflicts" (Bonn: Center for Development Research (ZEF), 2021)

⁵⁷⁵ Augustine Ujunwa, Chinwe Okoyeuzu, and Ebere Ume Kalu, "Armed Conflict and Food Security in West Africa: Socioeconomic Perspective," *International Journal of Social Economics* 46, no. 2 (November 2019): pp. 182-198

and grains such as wheat, seed oil, and corn⁵⁷⁶. In Ukraine, the agricultural sector plays a vital role in its economy and contributes to both national and global food security. This contribution reaches approximately four hundred million people⁵⁷⁷. The ratio of the workforce in agricultural production in Ukraine is approximately 17%. In addition, it is one of the largest exporters of energy and fertilizers, as well as the contribution of the Russian Federation to the global food market. Considering the contributions of both countries, FAO emphasizes that the destruction caused by the war and the damage caused by the pandemic will increase the risks to agricultural production and food security in the future⁵⁷⁸.

The main risk of the war in Ukraine is the failure to ensure the availability of food. War-related damage to crops, migration of producers or joining the front, and Ukraine's export restriction to protect the national food availability are key factors. For this reason, since it may affect the global food markets in the future, it may cause rises in the prices of products such as sunflower. Moreover, Ukraine appears to export 60% of its agricultural and food products by sea, but it could trigger reductions in supplies because of the Russian Federation's strategic pressure or blockade on trade lines⁵⁷⁹. In terms of logistics, closure of roads or damage to railway networks also hits the export of food and agricultural products. There may also be a decrease in commercial activities in the global food market. Many markets dependent on Ukraine's exports will

⁵⁷⁶ Shahmar Hajiyev and Viacheslav Potapenko, "Impact of War Between Russia and Ukraine on Food Security" <u>https://aircenter.az/uploads/4RXuDBd1rmoP.pdf</u> (accessed on May 01, 2022).

⁵⁷⁷ FAO, "The importance of Ukraine and the Russian Federation for global agricultural markets and the risks associated with the current conflict." <u>https://www.fao.org/3/cb9236en/cb9236en.pdf (accessed on May 1, 2022)</u>

 $^{^{578}}$ FAO, "Ukraine: Note on the impact of the war on food security in Ukraine – 25 March" (Rome: FAO, 2022)

⁵⁷⁹ Shahmar Hajiyev and Viacheslav Potapenko, "Impact of War Between Russia and Ukraine on Food Security" <u>https://aircenter.az/uploads/4RXuDBd1rmoP.pdf</u> (accessed on May 01, 2022).

feel the effects of the food crisis, such as Syria, Turkey, and the EU⁵⁸⁰. Thus, it covers that access to food will enter an economically risky process. In addition, migration due to war also affects access to food socially because it is inevitable that producers and workers who have important roles in the food system will migrate and create a vacuum in the system. Instability will occur in food products that cannot be produced, cultivated, or processed. According to Lang and McKee, it will be difficult to do in future seasons if the war continues, especially since the winter wheat could not be harvested due to the war⁵⁸¹. Although other countries try to contribute to closing this gap, the effects of increasing food demand in other countries will be seen widely. Currently, disruptions in the global food chain caused by COVID-19, together with the war, cause increases in the prices of food exported by Ukraine and Russia: wheat and barley increased by 31% and sunflower oil by 60%⁵⁸². On the other hand, the fact that the Russian Federation is one of the largest exporters of energy is a key issue in terms of the important level of energy needed in the agricultural sector and food systems⁵⁸³. In this respect, it is foreseen that the energy needs of the agricultural sector will be affected because of the economic sanctions imposed on the Russian Federation. In particular, the EU's commitment to Russian energy has been shaped by economic sanctions along with the war, resulting in increases in energy prices⁵⁸⁴. According to FAO, it will create volatility in the energy market in terms of natural gas and crude oil,

⁵⁸⁰ Petra Berkhout, Ron Bergevoet, and Siemen van Berkum, "A Brief Analysis of the Impact of the War in Ukraine on Food Security," *Wageningen Economic Research*, 2022.

⁵⁸¹ Tim Lang and Martin McKee, "The Reinvasion of Ukraine Threatens Global Food Supplies," *BMJ*, 2022, pp.1-2

⁵⁸² Ibid. p.1

⁵⁸³ Petra Berkhout, Ron Bergevoet, and Siemen van Berkum, "A Brief Analysis of the Impact of the War in Ukraine on Food Security," *Wageningen Economic Research*, 2022.

⁵⁸⁴ Luboš Smutka and Josef Abrhám, "The Impact of the Russian Import Ban on EU Agrarian Exports," *Agricultural Economics (Zemědělská Ekonomika)* 68, no.2 (2022): pp. 39-49

which will put pressure on the prices of many vegetable oils⁵⁸⁵. In addition, the need for energy is in many areas such as cleaning, storage, processing, and transportation of food products. In cases where food utilization cannot be provided in terms of cleaning, a food security problem will occur and may cause food loss. Overall, Russia has endangered its energy and commercial activities as a result of global economic sanctions, creating adverse conditions for the food supply⁵⁸⁶. Ukraine, on the other hand, has faced humanitarian crises due to the occupation as well as the decrease in agricultural production and exports in the war environment. Thus, the war situation between these two countries that contributed to the global food crisis is turning into a complete loss.

5.6. Conclusion

Agricultural production and food systems, which are the basic elements of food security, are faced with various challenges in the contemporary era. For agricultural production to be sufficient for global hunger and the food supply of an increasing population, it must continue in a continuous and stable manner. Food systems, which can be expressed as interlocking chains, can pose a threat as a result of disruptions, or pauses in a certain step. As mentioned above, the occurrence of these disruptions or pauses due to emerging challenges resulted from economic, social, political, and environmental reasons poses a high risk to food security⁵⁸⁷.

⁵⁸⁵ FAO, "The importance of Ukraine and the Russian Federation for global agricultural markets and the risks associated with the current conflict." <u>https://www.fao.org/3/cb9236en/cb9236en.pdf (accessed on May 01, 2022)</u>

⁵⁸⁶ Luboš Smutka and Josef Abrhám, "The Impact of the Russian Import Ban on EU Agrarian Exports," *Agricultural Economics (Zemědělská Ekonomika)* 68, no.2 (2022): pp. 39-49

⁵⁸⁷ FAO. "The State of Agricultural Commodity Markets", (Rome: FAO, 2015)

Additionally, economic challenges are affected by COVID-19 and extreme weather conditions, bringing intense pressure to the global food market. Losses in food production have occurred due to the inability to end hunger and poverty in the world or the fragile structure of food systems. People who had to leave their livelihoods by immigrating due to wars and conflicts can affect the decrease in agricultural production. Moreover, the fragile food system is adversely affected by the lack of availability of food, which is the most basic dimension. Availability also concerns environmental dimensions. For instance, the food system and agricultural production desperately need climatic conditions and water resources. In addition to the extreme weather conditions caused by this climate change, it can also cause problems in resource management, such as excessive use of irrigation water used in agricultural production. In this respect, it is inevitable that the balance of food supply and demand will suffer and affect food prices. Experiencing volatility can also trigger the pressure of hunger and poverty on households who cannot access food. Economic risks such as restrictions on export activities, increases in global food prices and other factors in the food system, and increases in oil and natural gas prices need to be highlighted⁵⁸⁸.

Additionally, the pandemic and war between Ukraine and Russia show how the world is intertwined, including food systems, households, and countries. In this respect, to produce enough healthy and accessible food for people worldwide, a more capable, resistant, sustainable, and effective structure should be formed against future food crises. It should be emphasized that agricultural production and food systems had to be more flexible from their fragile structure by strengthening through global cooperation, peace, investment, R&D, and assistance⁵⁸⁹.

⁵⁸⁸ FSIN and Global Network Against Food Crises, "Global Report on Food Crises" (Rome: 2021)

⁵⁸⁹ Rachid Serraj and Prabhu Pingali, "Agriculture & Food Systems to 2050," World Scientific Series in Grand Public Policy Challenges of the 21st Century, 2018

CHAPTER 6

CONCLUSION

Food Security has become a hot topic in the face of rising challenges, not only at the international level but also at national and household levels. It is a complex and multidimensional issue involving various aspects and dynamics that creates challenges. Therefore, existing mechanisms and international institutions in international relations are not capable of ensuring food security. There is still a lack of a global mechanism to eliminate those rising challenges.

Food has always been a significant factor in human history and International Relations. Although academic, public, and politicians' interest in food security has increased over the years, the issue of food is not a new phenomenon. Countries competed to capture rich fields, severe famines caused death, and agricultural exports increased the nation's wealth. Thus, Food represents not just nutritional importance for people but also the power of the countries. Similarly, food security is an essential issue in economics, the environment, health, and politics. Its multidimensional and complex nature brings attention to many challenges and aspects at many levels. Hence, Food security exceeds the national level and has grown into an international concern. It is affected by the rising challenges in the international area, such as pandemics, climate change, and wars. In that regard, Chapter 2 indicates how and why food security is a central political issue in international relations.

Because food and concerns on security are vital, new challenges, approaches, and frameworks have certainly appeared. Even though the food security concept began to have placed during the 1970s, the importance of food is always an issue. Millions of years ago, people gathered to plant, harvest, and consume; nowadays, it is not far away from this mentality. Countries have become the source of power to produce food and

feed their population to retain their power. However, it is not only the production and feeding. It led to evolving the definition of food security over the years. The definition basically means that when all people economically and socially access to adequate, nutritious, and safe food in a stable way for their active and healthy life. Hence, food security involves four pillars; "food availability, access, utilization, and stability." These pillars result from the multidimensional and multilevel nature of food security and present a broader picture for understanding. Therefore, understanding food security is essential because emerging challenges have impacts on each and different pillar of food security. Although existing mechanisms and institutions in international relations try to eliminate emerging challenges such as pandemics, rising temperatures, and volatility in food prices, they are not enough to deal with those rising challenges to ensure food security.

Moreover, Chapter 3 covers FAO as an essential global player in food security with its regional and international collaborations. FAO frequently emphasizes the significance of food security widely, but there are still barriers to ensuring food security globally by FAO. Specifically, the FAO is not a supranational body, so every member states have a right to vote and be part of the policies. In that regard, nationstates continue to prioritize their interests and agendas. Although FAO underlines the need to ensure food security through joint action, the priority of developed and developing countries can differ. For instance, the global food crisis in 2007-2008 showed that countries follow their national interest immediately to protect themselves. They implemented trade barriers and quotas for agricultural products accordingly. It can be seen that there are different directions among the donor, exporter, developed, and developing countries. This chapter shows that as an international institution, FAO cannot solve food security in the face of emerging challenges. It is noteworthy that the 1973 and 2007 global food crises occurred even though FAO still existed. Today, COVID-19 and Ukraine-Russia wars also have caused another global food crisis, and FAO's role can be seen as limited. Nevertheless, FAO continues to have regional collaborations with various countries or partnerships with multiple organizations to bring food-related issues to its agenda as a global priority.

Chapter 4 shows how food security is diversifying in national policies. It indicates that coping with food security in the face of emerging challenges is still insufficient to eliminate. Four countries selected from different continents, the USA, China, Brazil, and Egypt, are important regarding their varying levels of development and their different perspectives on food security policies.

The USA is one of the largest economies in the world. It is one of the largest agricultural exporters, making it a global food supplier. Food security policies in the US include "The Farm Bill and Food and Agricultural Acts," which aim to provide price support, supply control, deficiency payment, direct payments, crop insurance, and monetary aid. Especially started in the 1930s, agricultural support was used to stop farmers who dropped their job after Great Depression. The Farm Bill opens the door to a high amount of aid, especially for improvements in agriculture. As an important global food supplier, the US uses more than 80% of freshwater in agricultural production and the food system. It also contributes to releasing GHG as a second global emitter. Therefore, the policies of the USDA and the US National Adaption Plan aim to promote climate-sensitive targets and strategies, including adaption and mitigation, because extreme weather, hurricanes, droughts, and rising temperatures cause crop losses and water stress.

In the food security policies of China, ensuring self-sufficiency in the supply of basic food such as rice and grains becomes a priority. Considering China's population will exceed 1.4 billion in 2025, agricultural production capacity will profoundly affect the balance of food supply and demand in national and international food markets. China is not only the world's largest producer but also one of the largest consumers. Moreover, Famine and hunger problems throughout history shaped the food security policies of China. Grain self-sufficiency became the central food security policy. Thus, in the 70s, China prioritized accelerating rural development, modernization, and industrialization to prevent famine and poverty. The economic reforms have contributed to the emphasis on agricultural production and rural development to ensure food security. Nevertheless, China accelerated programs on agricultural subsidies, grain stocks, and market support prices. China also struggles with pressures on land and water resources that affect productivity. As the biggest GHG emitter in the world, China contributes to climate change's impact. Thus, the food security policies include investing in sustainable and climate-smart technologies. However, China invests in overseas territories to meet food demand and protect the fertility of its land resources.

Egypt is a lower-middle-income country, and agriculture has an important sector of the Egyptian economy. Agriculture is the livelihood of half of the Egyptian population. However, poverty levels and food insecure populations are at risk. The food subsidy program has become prominent in Egypt's food security policy. It aimed to increase food access by allocating an additional budget to food subsidies. Especially, Baladi bread, known as the local bread of Egypt, was one of the most consumed and subsidized food products. The government expenditures for the subsidy and wheat supply had increased considerably. It creates problems because uprisings and conflicts also rise when bread prices rise. Considering that people in Egypt spend nearly half of people's income on access to food, increases in food prices impact the decrease in purchasing power. The food policies include continuity of food subsidy and effective wheat production because Egypt still depends on imports. However, Egypt struggles with rising temperatures and water stress, such as less precipitation. Egypt uses "82% of the total water supply" from the Nile River. Hence, Egypt's policies must include investments in modern irrigation techniques, soil management, and agricultural production.

Brazil has become one of the largest economies in the region and even in the world. Thus, it has become one of the largest exporters. Food security policy includes the Family Farming program, which provides labor and loans to farm owners in rural areas to eliminate poverty and increase agricultural production. Moreover, Campaign Against Hunger and Hunger Map Program aims to end poverty and hunger throughout the country. They actively try to strengthen family farming, reduce social inequalities, and distribute agricultural products. However, forest areas are destroyed to be used for industrial resources or converted into agricultural areas. It contributes to agricultural production but damages the environment. Brazil's Agricultural Policy for Climate Adaptation and Low Carbon Emission" provides a new framework. Some crucial points are to convert pasturelands into arable land instead of forest areas and prevent problems affecting food security by adaptation and resilience to climate-related issues. Due to its complex and multi-dimensional nature, food security faces emerging and rising challenges in many critical areas, including the economy, environment, health, and wars. As seen in this study, it can be easily affected by economic and market dynamics, environmental problems, conflicts, and pandemics, as mentioned throughout Chapter 5. The key argument discusses that existing mechanisms and international institutions are not capable of coping with those emerging global challenges to food security. This chapter shows that it should not only be seen as a political tool but also play a crucial role in facing challenges.

Economic and market challenges mainly show that people's access to nutrition and food, which is their most basic need, is only possible with food availability. For this reason, increasing agricultural production and ensuring the availability of food become the most critical policy for countries. However, the volatility and rise in food prices cause economic crises at national and international levels, so it can trigger a decrease in agricultural production and closely affect food security. Specifically, economic challenges create food security for those who earn income from the agricultural sector and for households who spend most of their income on accessing food. This chapter stressed that volatility in food prices and instability in the market raises global, national, and household concerns. In this respect, if the availability and accessibility of food are endangered, it causes social unrest and financial produced in Egypt, the global food crisis puts the food security of the household and the country at risk.

Likewise, environmental challenges include drought, flood, soil degradation, and the decrease in water resources that change from region to region with the increased effects of climate change. Regarding food stability, utilization, and sustainability, it is noteworthy that agricultural production and food systems use water resources quite a

lot. The need for water is vital in terms of growing crops and sanitation. Moreover, the frequency and intensification of the effects of climate change on water resources and agricultural production pose a problem for all aspects of food security. This chapter stressed that agricultural production and food systems also contribute to environmental degradation. Various issues such as carbon emission, conversion of forest areas to arable land, and excessive or misuse of water and land can cause environmental degradation. For example, as mentioned in Chapter 4, a large part of the rainforest in Brazil was illegally cut down due to the establishment of the Family Farming program for increasing agricultural production. However, forests that hold GHG cause an increase in the impact of climate change. Moreover, China tries to maintain a balance between both agricultural production and imports to be able to meet its increasing population, but the frequent use of pesticides and fertilizers in production has increased the pollution of soil and water as well. It creates food safety issues in the country and global sense in food markets.

Given food security's economic and environmental challenges, Chapter 5 shows that the need for increasing agricultural production and maintaining nutritious and adequate food for all has created challenges for producers and consumers. In this respect, this chapter covers that using GMOs becomes crucial for eliminating pesticides and producing crops with additional nutrition. Notably, it leads various states to concentrate on this area and determine strategies. GMO production is practiced in multiple geographies, such as Brazil, especially the USA. Approximately 90% of the USA's corn, cotton, and soybean are produced with GMOs. However, reasons such as public concerns and the distance of the EU market to GMO foods create negative situations. On the other hand, in China, where GMO production is largely rejected by the public, there are increasing investments and studies for this technology. This chapter also discusses that the organic production method is still an area where countries concentrate. Particularly, it is significant because its nutritional aspect is high, and its harm to the environment is at the lowest level. However, its cost and difficulty in supplying the entire world reveal its negative side. For example, considering that about 1.5% of the cultivated land in the world is organic agriculture, it is a matter of debate that sufficient food can only be met by organic agriculture.

In addition, Chapter 5 discussed the necessity of food security as a prominent policy expressed in terms of being vulnerable to global challenges, such as the COVID-19 pandemic and the Ukraine-Russia war. This chapter showed that restrictions brought by countries under the threat of COVID-19 caused pauses and disruptions in the food supply chain. Moreover, negative situations occurred in their income and employment because of the curfews and restrictions on the working force in agricultural production and food systems. It is seen that the areas of food availability and access to food are at risk. Nevertheless, COVID-19 has a significant impact on the food system, considering that countries, especially those struggling with hunger and poverty, are the most affected ones.

Finally, the war between Russia and Ukraine has once again revealed how vital food security is in global and national policies but also shows how quickly affected by emerging challenges. The contributions of Russia and Ukraine to the global food supply are crucial. For instance, Ukraine's oilseed, wheat and corn exports and Russia's wheat, corn, fertilizer exports, and even energy become prominent. Therefore, the war between the two countries brings risks to food security while the effects of COVID-19 are not yet entirely over. As mentioned in this chapter, global and national problems arise regarding both the availability and access to food. Even if countries such as China, the USA, and Brazil increase agricultural production in certain food products to balance prices and fill the global food gap, a great effort is needed to prevent the global food crisis. The inability of Russia and Ukraine to supply food may lead to serious food crises in import-dependent countries such as Egypt and China. On the other hand, sanctions on Russia can increase global oil prices. Hence, oil contributes to the increase in food prices, especially as it is an essential input in agricultural production and food systems.

To sum up, food security is not a new phenomenon, and it has always been an issue at the national global, and household levels. Due to the complex and multidimensional nature of food security, this thesis argues that even though several scholars discuss food security could be ensured with the existing mechanisms and institutions in international relations, those are not capable enough to cope with emerging global challenges to food security. As mentioned, ups and downs in the global economic system, rising effects of climate change, dynamics of technology, pandemics such as COVID-19, and regional conflicts such Russia-Ukraine war create rising global challenges which involve global solutions in ensuring food security. The pandemic and the conflict between Ukraine and Russia demonstrate how interconnected the globe is, including food systems, households, and countries. In this regard, a more competent, resistant, sustainable, and effective framework against future food crises should be established to supply enough nutritious and accessible food for people globally. It should be underlined that agricultural production and food systems must be strengthened. However, such international mechanisms coping with emerging global challenges to food security have not yet been created.

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APPENDICES A. TURKISH SUMMARY / TÜRKÇE ÖZET

Gıda, insanlığın en temel ve en gerekli ihtiyaçlarından birisidir. İnsanlık için yaşamın devamlılığının sağlanması adına, gıda önemli bir enerji kaynağıdır. Başka bir ikame ile değiştirilemez. Böylece, gıda ile ilgili konular tarih boyunca her zaman ön planda yer almıştır. 10.000 yıldan fazla bir süre önce insanlar, tohum ekerek, ekin yetiştirerek ve hayvanları avlayarak kendilerini besleyip hayatta kalmak için bir arada kalmaya ve yerleşmeye başladılar. Gıda, tıpkı insani ihtiyaçlardan su ve barınacak bir yer gibi insanlar, topluluklar ve milletler arasında oldukça uzun süredir temel bir mesele olmuştur. Aynı şekilde, Maslow'un ihtiyaçlar hiyerarşisinde de görüldüğü gibi insanların üst seviyelerdeki mutluluk ve sevginin yer aldığı basamaklara çıkabilmesi için en temeldeki "gıdaya erişebilmeleri" ile mümkün olacaktır.

Uluslararası İlişkilerde gıda hakkı vazgeçilmez bir kavram olarak ortaya çıkar. Birleşmiş Milletlerin tanımladığı gibi, "Herkesin sağlık için yeterli bir yaşam standardına sahip olma hakkı vardır... gıda dahil..." Ancak, sadece yeterli gıdaya ulaşmak değil, aynı zamanda ekonomik olarak da dengeli ve besleyici gıdaya ulaşmak da bu hakkın kapsamındadır. Böylece gıda, ekonomik, çevresel ve sosyal zorlukların arttığı ve güvenlik gündeminde önemli etkiler oluşturduğu tartışmalarda önemli bir meseleyi oluşturmaktadır.

Gıda, Uluslararası İlişkilerde olmazsa olmaz bir konu olduğundan, tarih, gıda ile ilgili sayısız ve farklı meseleye tanıklık etmektedir. Örneğin, Batı uygarlıkları Osmanlı kontrolündeki baharat yolunun ana kaynağına ulaşmaya çalışırken yeni bir kıtaya adım atmıştır. Bir diğer örnek, teknolojideki gelişmeler tarımsal üretimin artmasına neden olurken yoğun su ve gübre kullanımı nedeniyle çevresel bozulmaların giderek arttığı görülmektedir. Dünyada her geçen gün artan nüfus da düşünülür ise ülkelerin nüfuslarını yeterince beslemesi ön plana çıkmaktadır. Bununla birlikte, ülkeler her zaman gıda üretimini geliştirmeye ve ekilebilir arazilerin kontrolünden daha da yararlanmaya çalışmaktadır. Bu açıdan ülkeler, açlığı ve yoksulluğu ortadan kaldırırken, nüfusu beslemek için birincil kaynaktırlar. Bu şekilde, gıda güvenliğine ulaşmış olan insanların ülke içindeki sayısını arttırarak toplumsal huzuru ve refahı da sağlarlar. Görüleceği üzere, gıda güvenliği son derece karmaşık, çok düzeyli ve çok boyutludur. Tarımsal üretimden iklim değişikliği etkilerine uyum sağlamaya, yerel gıda fiyatlarının dengelenmesinden küresel gıda tedarik zinciri aksaklıklarının azaltılmasına kadar birbiriyle ilişkili birçok alanda ülkelere zorlukları beraberinde getirmektedir.

Gıda güvenliği, gıda ile ilgili tüm bu sorunların ve krizlerin merkezinde yer alan bir meseledir. Uluslararası, ulusal ve hane düzeyinde oldukça çeşitli ve bağlantılı konuları ve haliyle zorlukları içermektedir. Yeterince uzun süredir akademik, politik ve çevresel tartışmaların merkezinde yer almaya devam etmektedir. Bu nedenle, gıda güvenliğinin birçok tanımı ve bakış açısı vardır. Ancak gıda güvenliğinin en bilinen tanımı FAO'nun tanımıdır. Temel olarak gıda güvenliği, tüm bireyler, aktif yaşamlarında beslenme ihtiyaçlarını karşılamak için yeterli gıdaya, güvenli, uygun fiyatlı ve istikrarlı bir şekilde erişime sahip olması olarak tanımlanabilir. Ek olarak, gıda güvenliği şu şekilde dört boyutta sınıflandırılır: gıdanın mevcudiyeti, erişilebilirliği, kullanımı ve istikrarı. Bunlara gıda güvenliğinin sütunları da denir. Gıda güvenliğini anlamak için daha geniş bir perspektif sunarlar ve çeşitli zorluklarla ilgili anlamını şekillendirirler. Bunlar hane, ulusal ve uluslararası düzeylerde çevre, ekonomi, sağlık vb. çeşitli kritik alanlarla yakından ilgilidir. Bunlar uluslararası alanda değişen koşullarla bir ülke içinde birbirlerini hızlıca etkileyebilmektedirler.

Bundan hareketle, tez, "Gıda güvenliğini sağlamak için mevcut mekanizmalar, gıda güvenliğine yönelik ortaya çıkan küresel zorluklarla başa çıkma kapasitesine sahip mi?" soruna cevap aramaktadır. Tarihsel ve politik bağlama dayalı olarak, uluslararası ve ulusal düzeydeki güncel yaklaşımlar ve gelişmelerle birlikte, uluslararası ilişkilerdeki mekanizma ve kurumların gıda güvenliğini sağlayamayacak durumda olduğunu iddia etmektedir. Teknolojik ve teknik dinamikler, küresel ekonomik sistemdeki iniş ve çıkışlar, COVID-19 gibi pandemiler, iklim değişikliği etkileri ve Ukrayna-Rusya Savaşı gibi bölgesel çatışmalar, küresel çözümler ve ortak müdahaleler gerektiren yeni küresel zorluklar yaratmaktadır. Ancak, gıda güvenliğinin uluslararası ilişkilerde mevcut mekanizma ve kurumlarla sağlanabileceğini tartışan birçok uzmanın iddialarının ve bilim insanlarının görüşlerinin aksine, yeterli kapasitede değildir. Dolayısıyla bu çalışma, bu tür uluslararası mekanizmaların henüz gelişmediğini göstermektedir. Tezin temel amacı, gıda güvenliğine yönelik ortaya çıkan çeşitli zorlukların mevcut mekanizmalar ve uluslararası kurumlar tarafından çözülemeyecek kadar yetersiz olduğunu tartışmaktır. Gıda, insanlığın en temel ihtiyacı olduğu için uluslararası ve ulusal alanlarda ön plana çıkmaktadır. Bu çalışma, Uluslararası İlişkiler disiplininde gıdanın gelişimini vurgulayarak, gıdanın anlam ve anlayışının tarihsel olarak geliştiğini göstermektedir. Bu nedenle gıda güvenliği, özellikle güvenlik alanında ulusal, uluslararası ve hatta hane düzeyinde öne çıkan bir konu olarak gelişmesiyle çok boyutlu ve karmaşık bir konu olarak ön plana çıkar. Bu çalışma ile ülkelerin gıda güvenliğini sağlamaya yönelik politikalarını, stratejilerini ve hükümet programlarını vurgularken, başta FAO olmak üzere uluslararası kuruluşların politikaları da gösterilmektedir. Bu bağlamda, gıda güvenliğinin sağlamasına yönelik ortaya çıkan küresel zorluklar analiz edilmektedir.

Karmaşık doğası nedeniyle gıda güvenliğine ilişkin algılar ve kavramsallaştırmalar tarih içinde gelişmiştir. Özellikle, artan çevre sorunları, 1970'lerden bu yana kamu ve akademik kaygıları kendine çekmiştir. 1973'teki küresel gıda krizi, kuraklıktan kaynaklanan gıda kıtlığı, gıda fiyatlarının artmasına neden olan petrol krizi ve tarım ürünleri üzerindeki ticaret engelleri ve kotalar gibi gıda ile ilgili çeşitli konular, gıda güvenliği gündemini şekillendirmiştir. Ek olarak, güvenlik ve gıda arasındaki bağlantı daha da derinleşmiş ve genişlemiştir. Soğuk Savaş döneminde iki kutuplu bir dünyada odak noktası nükleer güçler, çatışmalar ve savaşlar olsa da artan gıda fiyatları, çevre sorunları, enerji krizleri gibi bu sorunlar, ulusal ve uluslararası alanda etkisini hissetmiştir. Soğuk Savaş döneminin sona ermesinin ardından Birleşmiş Milletler ve FAO, küresel anlamda barış ve güvenliği tehdit eden ekonomik ve çevresel kaynaklar gibi askeri olmayan kaynaklara giderek daha fazla odaklanmaya başlamıştır. 1994 BM İnsani Gelişme Raporu, artan sıcaklıklar, gıda kıtlığı ve doğal yıkımın beraberinde getirdiği tehditler nedeniyle gıda ve insan güvenliğinin yakından ilişkili olduğunu belirtirken, 1996 Dünya Gıda Zirvesi, uluslararası düzeyde gıda güvenliğinin sağlanması adına en üst nokta olmuştur. Küresel alanda açlık ve yoksulluğa çözüm arayışları da sıklıkla ön plana koyulmuştur. Bununla birlikte, Dünya Ticaret Örgütü'nün kurulmasıyla ülkeler, açlığı ve yoksulluğu azaltmak için tarımsal ürünlerin kısıtlamalar ve ticaret engelleri olmaksızın adil ticarete ve rahat dolaşımına odaklanmışlardır. Öte yandan, daha çok tarım ihracatçısı ülkelerce ekonomik açıdan getiriler artsa da dünyanın birçok yerinde açlık bitmemiştir. Günümüzde dahi dünyada açlık hala etkisini sürdürmektedir. Ayrıca ülkelerin çıkarlarının peşinden hızla koştukları, dolayısıyla belirli bir tarımsal ürüne kota ve sınırlamalar uyguladıkları da görülmektedir. Örneğin, 2007-2008 yıllarında yaşanan küresel gıda krizi, uluslararası alanda artan gıda fiyatları ve gıda kıtlığı nedeniyle ülkelerin öncelikle kendilerini korumaya odaklandıklarını göstermiştir. Aynı şekilde, COVID-19 pandemisi, ülkelerin sağlık kaygısı gözeterek vatandaşlarını korumak adına sıkı kısıtlamalar getirmelerine neden olmuştur. Her ne kadar uluslararası kuruluşlarca ticari engelleri azaltma ve daha fazla iş birliğini teşvik etme isteklerini dile getirilmişse de ülkelerin tepkisi beklendiği gibi hızlı ve etkili olmamaktadır.

Ek olarak, FAO, gıda güvenliğini sağlamak için uluslararası politikada da önemli bir oyuncudur. Gıda ve tarımla ilgili endişeler FAO'nun kurulmasına yol açmış ve Uluslararası İlişkilerde ortak tepkiler için önemli bir adım oluşturmuştur. Temel sorun, FAO'nun politika yapma organı olan Konferans'ta üye devletlerin eşit olarak temsil edilmesi ve halen ulusüstü bir otorite eksikliğinin olmasıdır. Üyeler, zaman zaman ulusal çıkarlarına göre hareket ederek FAO'nun gündemini farklı konularda etkileyebilmektedirler. FAO, üyeler arasında daha fazla iş birliği ve açık iletişim sunmaya devam etse de ulusal çıkarların ve güç mücadelelerinin devam ettiği görülmektedir. Özellikle, FAO'nun yönlendirmelerini donör veya tarım ihracatçı ülkelerin etkilediği görülmektedir. Örneğin Çin, FAO'nun kaynak ortağı olarak kendi ülkesindeki gıda güvenliği sorunlarını göz önünde bulundurarak bazı gıda ürünlerinin programların yapıldığı ülkelerde öne çıkmasını desteklemektedir, finanse ettiği projede özellikle pirinç ve soya fasulyesi üretimini desteklenmesi gibi. FAO'nun mali kaynak ortaklarından olan AB, Ukrayna'da finanse edilen bir projede altyapının geliştirilmesi ve tarımın modernize edilmesi ile Ukrayna'nın tahıl ve buğday üretiminin sağlanmasına katkıda bulunmuştur çünkü Ukrayna Avrupa'nın ve hatta dünyanın önemli bir tarım ihracatçısı konumundadır.

Ülkeler açısından gıda güvenliği ve buna yönelik ortaya çıkan zorluklara karşı geliştirilen mekanizmalar ele alınmaktadır. Bu çerçevede, dört ülkenin, ABD, Çin, Mısır ve Brezilya'nın ulusal düzeydeki gıda güvenliği politikaları belirtilmektedir. Bu ülkelerin seçilmesindeki temel amaç, farklı gelişmişlik düzeyleri, ekonomileri, gıda güvenliğini sağlama yönelik farklı yaklaşımlarına sahip olmaları ve ayrıca farklı kıtalarda yer almaları olmuştur. Bu ülkelerin gıda güvenliğini sağlamaya yönelik temel yaklaşımları, gıda güvenliğinin çeşitli boyutlarını içermektedir. Brezilya gibi önemli bir tarım ihracatçısı çevresel bozulmaya büyük ölçüde neden olurken, Mısır gıda arzına olan bağımlılığı nedeniyle artan küresel gıda fiyatları karşısında toplumsal huzursuzluklarla karşılaşabilmektedir. Büyük bir tarım ihracatçısı olan Çin, artan nüfusunu beslemek için giderek artmakta olan bir şekilde tarım ürünleri ithal ediyor ve farklı ülkelerde arazi satın alarak buralarda daha fazla ürün üretiyor. ABD ise tarım ve gıda alanına büyük mali paylar ayırarak tarımsal üretimin devamlılığı, kuraklık ve sel gibi afetlerle mücadele, küresel gıda arzının istikrarı gibi konularda önemli bir oyuncu olmayı sürdürmeye çalışıyor. Bu ülkeler gıda güvenliğini sağlamada yaşanan zorluklar karşısında farklı yaklaşımlar benimsedikleri için bu çalışmaya dahil edilmiştir. Ayrıca bu ülkelerin tarım ve gıda politikaları, ulusal ve küresel düzeyde çeşitli zorluklar karşısında tarih boyunca şekillenmiştir. Böylece bu ülkelerin gıda mevcudiyeti, erişilebilirlik, kullanılabilirlik ve istikrar konularında ekonomi politik, çevresel ve sosyal durumları tanımlanmakta, tarım ve gıda politikalarına yansımaları ve etkileri detaylandırılmaktadır. Ülkelerin değişen politikaları gösterilerek gıda güvenliğinin ulusal düzeyde nasıl merkezi bir politika olarak ortaya çıktığı tartışılmıştır. Bununla birlikte, gıda güvenliği her zaman bir ülke meselesidir, ancak mevcut mekanizmalar gıda güvenliği ile başa çıkmak için hala yeterli değildir.
Bu tez, zorlukları asağıdaki gibi tanımlar; ekonomik ve piyasa, çevresel, teknik, COVID-19 gibi pandemiler ve Ukrayna-Rusya Savaşı gibi savaşlar. Temel bir beklenti olan küresel gıda güvenliğini ortak bir meydan okuma ve küresel alanda ortak eylemler görmek ön plana çıksa da ülkeler öncelikle ulusal gıda güvenliği ile ilgilenmekte ve iş birliğini ikinci plana koyabilmektedir. Örneğin, COVID-19 gibi bir pandemi veya gıda ihraç eden iki büyük ülke arasındaki savaş, küresel gıda güvenliğini ciddi şekilde etkileyebilir. Bu bağlamda bir ülkenin ilk ve öncelikli amacı, ticari faaliyetleri sağlık açısından kısıtlamak veya tarımsal üretim kapasitesini artırarak gıda açığını önlemek olacaktır. Uluslararası alanda ülkelerin öncelikle ulusal politikalar izlemesi kaçınılmazdır. Küresel gıda güvenliği tehditlerine ulusal düzeyde yanıt verilmeye çalışılsa da karşılıklı bağımlılıklar ve ortak kaygılar iş birliği ve diplomasiye duyulan ihtiyacı göstermektedir. FAO'nun sıklıkla bahsettiği iş birliği ve diyalog, gıda güvenliği söyleminin gelişmesine katkı sağlıyor. FAO, bölgesel ve küresel iş birliğinin altını çizmeye devam etmekte ve gıda güvenliği yaratan sorunlara yönelik strateji ve programlar belirlemektedir. Dolayısıyla uluslararası alanda yaşanan güç mücadelesi ve ülkelerin farklı çıkarları, FAO'nun etkin bir şekilde hareket etmesinin önünde bir engel teşkil etmektedir. Devletlerin gündemlerine odaklanmaları ve uluslararası arenada uluslarüstü bir otoritenin olmaması gibi sorunlar, gıda güvenliği sorunlarıyla baş etmede yetersiz olduklarını ve gıda güvenliğine yönelik tehditlerin devam edebileceğini göstermektedir. Daha da önemlisi, küresel gıda fiyatlarındaki artışlar, özellikle gıda ithalatına bağımlı gelişmekte olan ülkelerde, hane halkının gıdaya erişimini tehlikeye atmaktadır. Gıda harcamalarını çok yüksek olan haneler, artan gıda fiyatları karşısında ülke içinde toplumsal huzursuzluk yaratabilir. Ayrıca, küresel gida pazarındaki gıda arz ve talebindeki istikrarsızlık, küresel endişeleri tetikliyor. Gıda ithalatçısı ülkelerin küresel gıda pazarındaki istikrarsızlıktan kolaylıkla etkilenebileceği görülmektedir. Bu da gıda güvenliğini riske atar.

Çevresel zorluklar açısından, iklim değişikliğinin etkilerinin ve yoğunluğunun artması, tarımsal üretim ve gıda sistemlerinin vazgeçilmez unsurları olan su ve toprak kaynakları üzerindeki baskı gıda güvenliğini etkilemektedir. Özellikle tarımsal üretim için önemli olan uygun sıcaklık, zengin arazi ve yeterli su sağlanması çevresel sorunların en başındadır. Gıda güvenliğinde en önemli faktörün "gıda bulunabilirliği" olduğu düşünüldüğünde, çevresel zorluklar sütunlar için temel bir tehlike oluşturmaktadır. Bu, ülkelerin sorumluluğu olarak görülse de çevresel zorluklar hem küresel hem de ulusal bir yanıt gerektirmektedir. Küresel alanda, FAO ve BM gibi uluslararası kuruluşlar, iklim değişikliği ve bunun gıda güvenliği üzerindeki etkileriyle mücadele etmek için yoğun bir şekilde çalışmaktadır. Özellikle FAO, bölgesel iş birliklerini yatırımlar, mali ve teknik yardımlarla desteklese de ülkelerin uyum ve azaltma hedefleri de iklim değişikliğinin gıda güvenliği üzerindeki etkileriyle mücadelede yetersiz kalabilmektedir. Spesifik olarak, iklim değişikliğinin önde gelen nedenlerinden biri olan atmosferdeki sera gazı birikimi, ülkelerin etkin olmayan gelecek hedefleri ile artmaya devam ediyor. Örneğin, küresel karbon salan ilk iki ülke olan Çin ve ABD, küresel gıda arzına katkıda bulunurken aynı zamanda iklim değişikliğinin etkilerini de katkıda bulunmaktadır.

Teknik zorluklar açısından, öncelikle Genetiği Değiştirilmiş Organizma (GDO) ile organik üretim arasındaki avantajlı ve dezavantajlı durumlara dikkat çekilmektedir. Hızla artan dünya nüfusu için çeşitli üretim teknikleri ön plana çıkar. İki farklı görüşün olduğu GDO ve organik üretim teknikleri popüler konulardandır. Bu nedenle, bazı bilim insanları GDO'ların başarısını ve gerekliliğini vurgularken, bazıları da GDO'larla ilgili endişelerini vurgulayarak, gıda güvenliğini sağlamanın daha iyi bir yolu olarak organik üretimi önermektedir. Buradaki en önemli tartışma, GDO'ların önemli bir teknolojik gelişme olmasına rağmen, sağlık ve çevre sorunları dikkate alındığında bir ülkede kamusal ve politik kaygılar yaratmasıdır. Organik tarım, küresel çapta ekilen alanları göz önüne alındığında çevre ve sağlık için vazgeçilmez bir teknik olsa da organik tarım ile tüm dünyaya yeterli gıdayı temin etmenin zor olacağı ve maliyetlerinin yüksek olacağına dikkat çekilmektedir.

Ek olarak, COVID-19 gibi pandemiler ve Ukrayna-Rusya savaşı gibi bölgesel çatışmalar, gıda güvenliği politikalarını şekillendirmekte ve küresel gıda tedarik zincirini etkilemektedir. Birincisi, COVID-19 salgını, ülkeler tarafından getirilen kısıtlamalar ve yasaklar nedeniyle hem uluslararası hem de ulusal düzeyde bir duraklama ve aksamalara neden oldu. Bu, iş gücündeki ve hanelerin gelirlerindeki azalma gibi ekonomik krizler de dahil olmak üzere gıda sistemlerini etkilediği için bir zorluk olarak ortaya çıkmaktadır. Ayrıca ülkeler bazında birbirini takip eden seyahat ve ticaret kısıtlamaları gıda arzı açısından oldukça sorunlu bir duruma dönüşmektedir. Ülkelerin sağlık koşullarını önceliklendirme konusundaki kısıtlamaları, gıda güvenliğini her düzeyde tehdit etmektedir. Gıdaya erişim konusunda zaten hassas ve kırılgan yapıdaki ülkeler, aksamalardan ve duraklamalardan ilk etkilenenler olmaktadır. Bununla birlikte, COVID-19'un etkileri, ülkelerin ekonomik durumu ve hızlı tepki verme kabiliyeti nedeniyle farklılık göstermektedir.

Son olarak Ukrayna-Rusya savaşı 2022 yılının ilk çeyreğinde literatüre girmesine rağmen gıda güvenliği, gıda kıtlığı, gıda tedarik zinciri gibi konular üzerinde tartışmalar yaratmaya devam ediyor. Bu, zaten COVID-19'dan etkilenen dünyada toparlanmaya çalışan ülkelere zorluklar oluşturmaktadır. Ayrıca Rusya ve Ukrayna dünyanın en önemli tarım ihracatçıları olduğu için Rusya ve Ukrayna tarım ürünleri ithal eden ülkeler savaştan hızla etkileniyor. Öte yandan, bu durum diğer ülkelerin küresel gıda arz açığını doldurmak için adımlar atmasına yol açacaktır. Örneğin, ABD ve Brezilya temel tarım ihracatçılarındandır. Bu nedenle, belirli ürünlerde tarımsal kapasiteleri arttırmaları, gıda açığını ve artan gıda fiyatlarını ortadan kaldırmak ve aynı zamanda ekonomik çıkarları karşılamak için kaçınılmaz olacaktır. Ancak iki ülke arasındaki savaşın ne zaman biteceği bilinmediği sürece yükselen fiyatlar, azalan gıda arzı ve ticaretteki aksaklıklar gıda güvenliğini olumsuz etkilemeye devam edecek.

Özetlemek gerekirse, tarih boyunca gıda her zaman bir konu olmuştur. Bununla beraber, gıda güvenliği yeni bir olgu değildir ve ulusal, küresel ve hane düzeyinde her zaman bir sorun olmuştur. Gıda güvenliğinin karmaşık ve çok boyutlu doğası nedeniyle, bu tez, birçok akademisyenin gıda güvenliğinin uluslararası ilişkilerdeki mevcut mekanizmalar ve kurumlarla sağlanabileceğini tartışmasına rağmen, bunların gıda güvenliğine yönelik ortaya çıkan küresel zorluklarla başa çıkmak için yeterince kapasitede olmadığını savunmaktadır. Daha önce de belirtildiği gibi, küresel ekonomik sistemdeki iniş ve çıkışlar, iklim değişikliğinin artan etkileri, GDO ve organik üretim

gibi teknik dinamikler, COVID-19 gibi pandemiler ve Rusya-Ukrayna savaşı gibi bölgesel çatışmalar, gıda güvenliğini sağlamada küresel çözümleri içeren artan küresel zorluklar yaratmaktadır. Pandemi ve Ukrayna ile Rusya arasındaki çatışma, gıda sistemleri, haneler ve ülkeler de dahil olmak üzere dünyanın birbirine ne kadar bağlı olduğunu gösteriyor. Bu bağlamda, küresel olarak insanlar için yeterli besleyici ve erişilebilir gıda sağlamak için gelecekteki gıda krizlerine karşı daha yetkin, dirençli, sürdürülebilir ve etkili bir çerçeve oluşturulmalıdır. Tarımsal üretim ve gıda sistemlerinin kırılgan yapılarından güçlendirilmesi gerektiğinin altı çizilmelidir. Bununla birlikte, gıda güvenliğine yönelik ortaya çıkan küresel zorluklarla başa çıkmak için bu tür uluslararası mekanizmalar henüz oluşturulmamıştır.

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