



المركز السوري
لبحوث
السياسات
Syrian Center For
Policy
Research

FOOD SECURITY AND CONFLICT IN SYRIA




JUNE, 2019




TABLE OF CONTENT


Acknowledgment	4
Executive Summary	6
Introduction	10




Chapter 1 : Methodology	12
The concept of food security and food sovereignty and measurement	14
Key dimensions of food security	15
Research Constraints	15



Chapter 2 : The Pre-conflict political economy of agriculture	18
Preface	20
Contribution of agriculture to the Syrian economy before the conflict	23
Internal Migration	27
Poverty levels for agriculture workers	29




Chapter 3: Food Security in Syria	30
Introduction	32
Food Security Index	33
Availability of food	37
Access to Food	47
Utilization	51
Stability and Sustainability	55




Chapter 4 : Determinants of food security	62
Model Building	64
Model Results	64
Food as a weapon in conflict situations	66



Chapter 5 : Policy Options to Address Food Deprivation	68
---	-----------



English References	76
Arabic References	77
Appendix 1: Field survey of the population situation	80
Appendix 2 Food Security Index determinants, regression results	86



ACKNOWLEDGMENT

This report was prepared by the Syrian Centre for Policy Research, SCPR, in collaboration with the American University of Beirut, AUB, to develop research and studies on food security in conflict situations. The research was funded by a grant from the International Development Research Centre (IDRC) of Canada to the Department of Environmental Health, Faculty of Health Sciences at AUB.

The research was developed in phases; (i) the 2014 Population Status which was designed to assess the economic and social conditions inside Syria. This survey assessed the status of food security in the country as well; (ii) various studies and researches conducted by the SCPR to assess economic and social performance in Syria during conflict; (iii) the debates and discussions conducted during the 'Knowledge Production to Achieve Prosperity in Rural Areas in the Arab World' conference held in September 2016, which contributed to the development of the concepts and framework of the report, as well as during the 'Agriculture and Land' technical workshop in January 2017. The research also benefited from the preparatory discussions for the "Arab Watch" report on the right to food, by the Arab NGO Network for Development.

The methodology of the research was overseen by Professor Martha Mundy, who made exceptional efforts in supporting the development of the report, generously participating, leading discussions and reviewing the final research. The SCPR team thanks her for her valuable contribution and support. The SCPR team highly appreciates the contributions of Dr. Rima Habib in managing the research project on behalf of the AUB, and also thank Mr. Karim Sabagh for his contribution to the discussions of the research methodology and its results as well as for his participation in the organization of the related workshops.

The report authors from SCPR Ramia Ismail, Rabie Nasser, Nabil Marzouk, Zaki Mehchy and Ali Rustom. The SCPR recognises the contributions of Bassel Kaghadou, Omar Dahi and Philippe Chite in the development of the report, its messages and recommendations. The overall project was managed by Rabe Banna. The Arabic editing was done by Jad al Karim Jiba'i. Sadiq al Amin designed the report, and it was translated into English by Alissar Kaghadou.

The Centre thanks the important contribution of Hassan Katana through his background paper on the agricultural sector and food security in Syria.

We also wish to thank all the researchers, experts, and volunteers who participated in the research.

Disclaimer:

The views expressed herein are solely those of the author and do not reflect the opinion of the American University of Beirut.

Copyright © 2019 Syrian Center for Policy Research, Beirut, Lebanon.

For inquiries or comments: Syrian Center for Policy Research:

Email info@scpr-syria.org

Website scpr-syria.org

May 2019

EXECUTIVE SUMMARY

The research aims to analyze the political economy of food security in pre-conflict Syria and the role of public policies in the availability, accessibility, utilization and sustainability of food. It also provides a guide to measure the food security situation during the conflict based on the Population Status Survey, to assess the impact of the conflict at the national and local levels.

The research examines the demographic, social, economic and institutional determinants of food security during the conflict and provides suggestions for policy options that can address the deteriorating of the food security situation in Syria.

Although armed violence has declined in 2019, the components and triggers of violence persist with the accumulation of human, material and institutional losses and the exacerbation of injustice and humanitarian needs. The conflict has changed Syria into a country suffering from severe food crises in terms of availability, use, sustainability and distribution.

The violation of the human right of access to food is one of the darkest aspects of the conflict. The systematic denial of food has been used as a tool of conflict by the all warring forces. The right to food, in addition to being a basic human need, is the basis for preserving a decent life.

The Human Rights Charter states that the right to adequate and healthy food is an obligation that must be provided to all citizens. The Charter recognizes the importance of an adequate economic, social and political environment as a base for food security, poverty reduction and deprivation.

Agriculture in the Syrian Economy before 2011

- The agricultural sector is one of the most impor-

tant sectors in the Syrian economy. The average annual growth rate of the sector for the period 1970-2010 was about 3.9 per cent with a contribution to the overall GDP growth of about 23 per cent. The sector is economically interrelation with other sectors such as industry, construction, reconstruction and energy. The sector's contribution was inconsistent due to its high impact on climate conditions.

- The sector share of GDP fell from 32 per cent in the 1970s to about 22,4 per cent in the first decade of the new millennium, reaching 17 per cent in 2010. The share of the agricultural sector in total employment fell from about 50 per cent in 1970 to about 14 per cent in 2010.
- The state engaged in policies that excluded farmers from participation in decision-making leading to poor representation and poor accountability. The lack of effectiveness of the sector's governing institutions, the neoliberal economic policies adopted since the 1990s and resulting in reduced public investment and subsidies, all these elements combined, contributed to increased inequalities, poor distribution, waste of resources, and boosted the role of rentier sectors such as real estate.
- Public policies governing agricultural sector have a direct impact on the geographical distribution of the population, notably the trend of migration from rural to urban. The rural population increased from 43 per cent of in 1970 to 54 per cent

in 2010. Development indicators show that the richest areas in terms of agricultural production, especially the eastern and northern regions, are the most deprived in Syria in various developmental indicators.

- The public policies increased poverty levels, notably agriculture workers received the second lowest wage in the economy, making 58 per cent of these workers living in extreme poverty in case of reliance solely on agriculture wages. Women working in rural areas suffer particularly from poverty as a result of low wage levels and existing social conditions.

Food Security Index and the Impact of Conflict

- The results of the food security index show that Syria had high levels of food security prior to the conflict, but the dimensions of the index indicate that the strengths are availability and accessibility while the utilization, stability or sustainability of the food suffers due to poor sources of income and unsustainable use of natural resources.
- All dimensions of the food security index declined, but the most significant decline was access to food at about 48 per cent, affected by the siege and restrictions on the movement and the decline in purchasing power. This was followed by a decrease of 37 per cent, 25 per cent and 23 per cent, respectively. In the period 2014–2018, the index fell by about 8 per cent, although the access dimension improved by about 3 per cent as a result of the decline in the siege of the military operations. However, abundance, stability and use of food dimensions continued to decline.
- The results showed a significant disparity between the regions. The most deteriorated governorates on the food security index were Al-Hasakah, Ar-Raqqa, Aleppo, Quneitra, Deir el-Zour and Idleb, which declined at rates greater than the national average.

Conflict and Production Factors

- Estimated from quantities of production, the agricultural GDP in Syria decreased by about 50 per cent, or half, compared with 2010, and both

plant and animal products declined by 49 per cent and 51 per cent, respectively. Although the fighting was less in 2018, the sector witnessed deterioration in agricultural production, especially in rain-fed irrigated crops, due to adverse climatic conditions.

- Despite the decline in agricultural production, the sector formed a protection network for many Syrians during the tragic conflict conditions, to secure work opportunities and food.
- The conflict has led to massive and uneven destruction of human, institutional, physical and environmental factors. In terms of manpower, hundreds of thousands of people have been killed, millions injured, about half of the population has been forcibly displaced, and the number of agricultural workers has fallen to about half between 2010 and 2018. The sector has lost many of qualified personnel.
- On the institutional level, several systems impacting agricultural policies emerged. These emerging 'systems' centralized around the conflict by using agricultural resources and food products for the prevalence of the dominant powers, and by violating the rights to protection, food and property. Each warring party targeted the food security of the other.
- The conflict has led to significant destruction of agricultural physical resources, including natural resources, infrastructure, equipment and livestock. These resources were directly targeted by shelling, looting, vandalism, and indirectly through encroachments on lands and destructing forests. The scarcity of production inputs, such as energy, fertilizers and seeds, and its increased prices also contributed to the deterioration of production.

Access to Food

- The dimension of access to basic foodstuffs declined as a direct result of siege policies. Forced displacement and restrictions on safe movement contributed to the sharp decline in the dimension, leading to widespread war economics such as monopolization, royalties, looting, destruction of individuals' properties, loss of employment opportunities and income sources, and

poverty.

- Siege strategies during war represent a most serious violation, as society is starved through “collective punishment” until submission. Some 2.5 million people have faced sieges between 2015 until 2018, with a peak in 2017 when around 970,000 people were simultaneously under sieges in Ghouta, Deir el-Zour, Aleppo, Al-Rastan and other areas. Siege conditions included denial of access to food and humanitarian assistance, restrictions on the movement of populations, and targeting of besieged areas with various types of weapons.
- The considerable efforts of local communities, expatriate groups and international organizations to provide humanitarian assistance have been unable to cope with the huge needs generated by the conflict. They have been largely influenced by the conflict forces, which impacted the allocation of these resources serving war economies. Furthermore, these initiatives have overemphasized the relief side rather than the development side.
- The dimension of access to food was also influenced by demand factors, with a population of 19.4 million in 2018. The country witnessed high mortality rates, declining fertility rates and waves of asylum abroad of some 5.3 million people, left 21 per cent of Syrians out of the country, reducing demand for food.
- Living costs continued to increase, at the same time income sources, wages and job opportunities decline. Many families lost their breadwinners, forcing them to rely on subsidies that do not meet their daily needs. Based on statistical evidence and expert evaluations, (SPCR) estimates that the consumer price index (CPI) has risen sharply, as the prices of some commodities rose more than ten times pre-conflict levels. Policies to reduce support for major commodities such as oil derivatives and electricity, as well as the drop in the value of the Syrian pound have contributed to significant jumps in prices. The real wage average was about 24 per cent of the wage for 2010.
- Poverty and deprivation rates reached a high level of 93.7 per cent by the end of 2017 based

on the household threshold for poverty of an average of 181,000 Syrian Pounds per month, while extreme poverty reached 59.1 per cent in the same year.

Utilization

- The results of the research show a significant deterioration in the quality of available food, and a clear imbalance in food composition during the conflict, where the reliance on cereals on the expense of meat, milk and vegetables increased. This evidenced by the decline in nutrition indicators for children during conflict, notably in areas that have suffered heavy clashes or sieges.
- Access to improved drinking water decreased from 89.1 per cent prior to the conflict to 32.6 per cent during the conflict. The index for availability of cooking gas declined from 98.3 per cent prior to the conflict to 38.3 per cent during the conflict with besieged areas hit the hardest.

Stability and Sustainability

- The results indicate a deterioration of the stability dimension due to increased dependence on imports and food assistance, deterioration of living conditions and income, as well as environmental degradation.
- The food sources index, which reflects the degree of stability of food supplies for Syrian households, shows a decline in the share of food from local sources. Relative dependence on humanitarian assistance and on imports has increased, especially in border areas.
- Work provided 47 per cent Syrian households’ income sources during the conflict, although its contribution declined significantly from 2010 by about one-third. International organizations contribute only 6 per cent, comparable to the contribution of local NGOs.
- Trade of agricultural and food products between Syria and neighboring countries has also continued in irregular ways. Neighboring countries have been a major source of the population’s need for agricultural and food products especially in border towns and cities.

Food Security Determinants

- Results show that the most important determinant of the food security is the institutional performance of dominant forces in the region. Tyranny, exclusion, marginalization, discrimination between the population and the use of armed violence undermine the right to food and lead to the deterioration of food sovereignty. Institution-building on authoritarianism and violence leads to the consolidation of food deprivation, which in turn is a factor in sustaining violence.
- Social capital is positively related to food security, which indicates the importance of trust, solidarity, cooperation and volunteerism in alleviating the food security crisis of the Syrians during the conflict. The breakdown of social relations through polarization, the spread of violence, hatred, discrimination, rejection of the other, and politicization of identity has contributed to the deterioration of the food security situation.
- The results showed a negative relationship between the spread of conflict economy activities and the food security index. Engaging in illegal activities such as smuggling, theft, royalties, looting and participation in fighting was associated with deteriorating food security. As the structure of power and wealth is changed through violence, the impoverishment of society was exploited and the building blocks of everyday life were destroyed by the subjugating powers. The spoils of war provided incentives for loyalists and involvement in violence.
- The highest priority is to stop violence and to dismantle authoritarian institutions through a radical transformation process that ensures broad community participation to build participatory, efficient and accountable institutions capable of addressing the grievances and harm of conflict, establishing respect for rights, and ensuring human security. Secondly, building the productive economy in the face of the economics of violence, through positive stimulation of productive work and of the participation of men and women in economic activities not based on rent, exploitation and waste of resources, requires a focus on rural stimulation and agricultural production. Furthermore, working on community reconciliation and investment in building trust and solidarity among individuals as an essential part of addressing the causes of food deprivation.

INTRODUCTION

Bitter years have passed for Syrians, the result of an intractable conflict. Despite the recent decline in violence, the main foundations of violence remain with the accumulation of human, material and institutional losses, as well as increase in injustice and humanitarian needs. The conflict has changed Syria into a country suffering from severe food crises in terms of availability, use, sustainability and distribution. The violation of the human right to food is one of the darkest aspects of the conflict; the systematic denial of food has been used as a tool of war by conflicting forces. The right to food, in addition to being a basic human need, is the basis for preserving a decent life. The Human Rights Charter states that the human right to adequate and healthy food is an obligation that must be provided to all citizens. The Charter recognizes the importance of an adequate economic, social, and political environment as an essential foundation for food security and the reduction of poverty and deprivation.

The conflict has undermined food security. Hundreds of thousands of people were killed or injured, integral parts of infrastructure and the elements of production have been destroyed, notably agricultural and industrial facilities, and plant and animal wealth, environmental degradation, and fragmentation of markets. The armed violence forced peasants to leave their lands, and security forces on

all sides restricted access to lands and markets.

Despite the humanitarian assistance provided to the Syrians internally and abroad, the quantity, distribution methods and effectiveness of this assistance has been marred by many shortfalls due to sieges and the intensity of hostilities in many areas, in addition to the severe loss of assets, infrastructure and natural resources, and exclusive policies against individuals and local communities. Humanitarian assistance does not provide a sustainable solution to acute food security deterioration.

This research aims to analyze the political economy of food security in pre-conflict Syria and the role of public policies in the provision, use and sustainability of food. It will provide a guide to measuring the food security situation in conflict, based on a Population Status Survey, to assess the impact of conflict at the national and local levels. The research examines the demographic, social, economic and institutional determinants of food security during the conflict and provides decision-makers suggestions for policy options that can contribute to addressing the deteriorating food security situation.



CHAPTER 1: METHODOLOGY

METHODOLOGY

The methodological framework of research is based on the broad concept of development as an extension of human choices through empowerment, capacity-building and equal opportunities for all, within an environment that guarantees human rights, including the right to food.

The research discusses the concepts of food security and food sovereignty and focuses on the importance of ensuring healthy and appropriate food for communities in sustainable ways that guarantee the rights of future generations and preserves the environment. Using the analytical framework of the political economy of food security, the main actors in production, distribution, consumption and the impact of public policies on food security are examined.

The specificity of the research comes from the analysis of food security in the context of conflict. A composite guide to measuring food security has been developed based on the Syrian Population Survey to measure the impact of conflict on food security dimensions at the local and national levels. The research used econometric tools to identify key determinants of food security indicators in order to identify the possible causes of food insecurity during the conflict. Based on the results of the analysis of the various instruments, the research suggests alternative policies to overcome the effects of conflict on food security.

The determinants of this research include the lack of data, difficulty of access and various bias under harsh conflict conditions, institutional constraints, as well as frequent and irregular population displacements. To mitigate these challenges in the future, researchers, humanitarian actors, and policy makers must work together to develop and implement effective frameworks and tools to ensure that food security abuses are documented immediately and that the international community provides relief according to the needs of the local community.

1.1 The concept of food security and food sovereignty and measurement

- According to the Food and Agriculture Organization of the United Nations (FAO), food security is achieved when all members of society have the physical and economic capacity to access adequate, safe and nutritious food at all times, to meet their food needs and preferences, so as to lead healthy and effective lives. This definition focuses on a multidimensional concept of food security, which includes four main dimensions: food availability, access to food, quality of food intake, and sustainability of the three previous long-term factors (FAO, 2006). The organization stresses the importance of the economic, social, and political environment as a fundamental context that enables countries to provide the necessary food security for their citizens and to reduce poverty. Democracy and the protection of human rights are obvious prerequisites for the food security of community members (FAO, 1996).
- Civil society organizations and a group of non-governmental organizations meeting in Nielsen, Canada in 2007 criticised the concept of Food Security and adopted the concept of Food Sovereignty. This includes six additional criteria that take into account the importance of food as a basic need to be made one of the priorities of government policies, as food should not be considered a mere commodity. The criteria include supporting sustainable livelihoods, respecting the work of food producers, localization of food systems as well as resistance to dependence on remote and unaccountable firms. The

concept of food sovereignty ensures the right of all to benefit from and participate in access to land, grazing, water, seeds, livestock, fish and other natural resources, and emphasizes the development of knowledge and skills through local research and studies which contribute to supporting local production. Finally, sustainable action ensures the preservation of ecosystems and natural resources.

1.2 Key dimensions of food security

The main concepts of food security are:

- **Food availability** : This dimension is on the supply side of food security and is determined through adequate food production, stock levels and import possibility, domestically or internationally, to ensure food security for families and individuals. Food availability is determined by stages of production, storage, distribution, marketing and exchange (FAO, 1997). The availability is measured through indicators of agricultural production, output, stocks and imports.
- **Access to food** : This axis addresses those policies which ensures families and individuals accessibility to available products in a sufficient, adequate and efficient manner. This is mainly related to incomes, spending, markets, and prices. The causes of hunger and malnutrition arise from food scarcity, the lack of access to available food, and poverty. The process of collecting information and the degree of reliability of this information is controversial (Barret, 2010). This dimension can be measured by assessing government policies and conducting market studies through income and distribution indicators, prices, operations and marketing.
- **Utilization** : This dimension examines the quality of available food to guarantee that food is sufficiently safe and nutritious to ensure an active and healthy life. This can be measured through several indicators including: health status, water quantity and quality, food diversity and nutritional status of individuals, biological utilization of macronutrients found in food (such as potassium, magnesium and iodine) and micronutrients (i.e. vitamins, mineral salts and secondary plant materials) for both adults and children.
- Food availability alone does not reduce food insecurity if people do not benefit from food properly, which is guaranteed by good nutrition and health education. Thus, food security is achieved only by obtaining sufficient nutrients for a productive and healthy life. As a result, sanitation, education and health care are important tools for food security (Tweeten, 1999). Demographics and levels of education for family members also determine household preferences, which affect the type of food purchased (Garrett and Ruel, 1999).
- **Stability and sustainability of food** : This dimension includes food stability: access to and provision of food at all times, which including the availability of food stocks, disaster mitigation and risk management resulting of market mechanisms. Food supply stability and accessibility can be measured through sustained production, trade, inventories, changes in consumption, changes in income and the prevalence of temporary or chronic hunger (Boeing, 2016).
- The global food crisis from 2008 has promoted re-examination of the role of the state in developing policies to ensure sustainable food security through supporting the agricultural sector, increasing food production and raising productivity to meet the growing demand for food. However, the most pressing issue today is access to food, which is linked to public policies such as redistribution of resources, income and employment. Additionally, linking food to good nutrition is essential to secure social protection, especially in emergencies and crises (Gordillo and Ménde, 2013).

1.3 Research Constraints

This research was carried out in a context of armed conflict that led to a climate of fear, anxiety, polarization, displacement and instability. These circumstances greatly affect the ability to verifying accuracy and reliability of data and surveys carried out. Despite considerable effort given in designing and implementing the survey, processing results carefully according to the research constraints is very important, and highly recommended by the research team.

Processing results carefully according to the research constraints is very important, and highly recommended by the research team

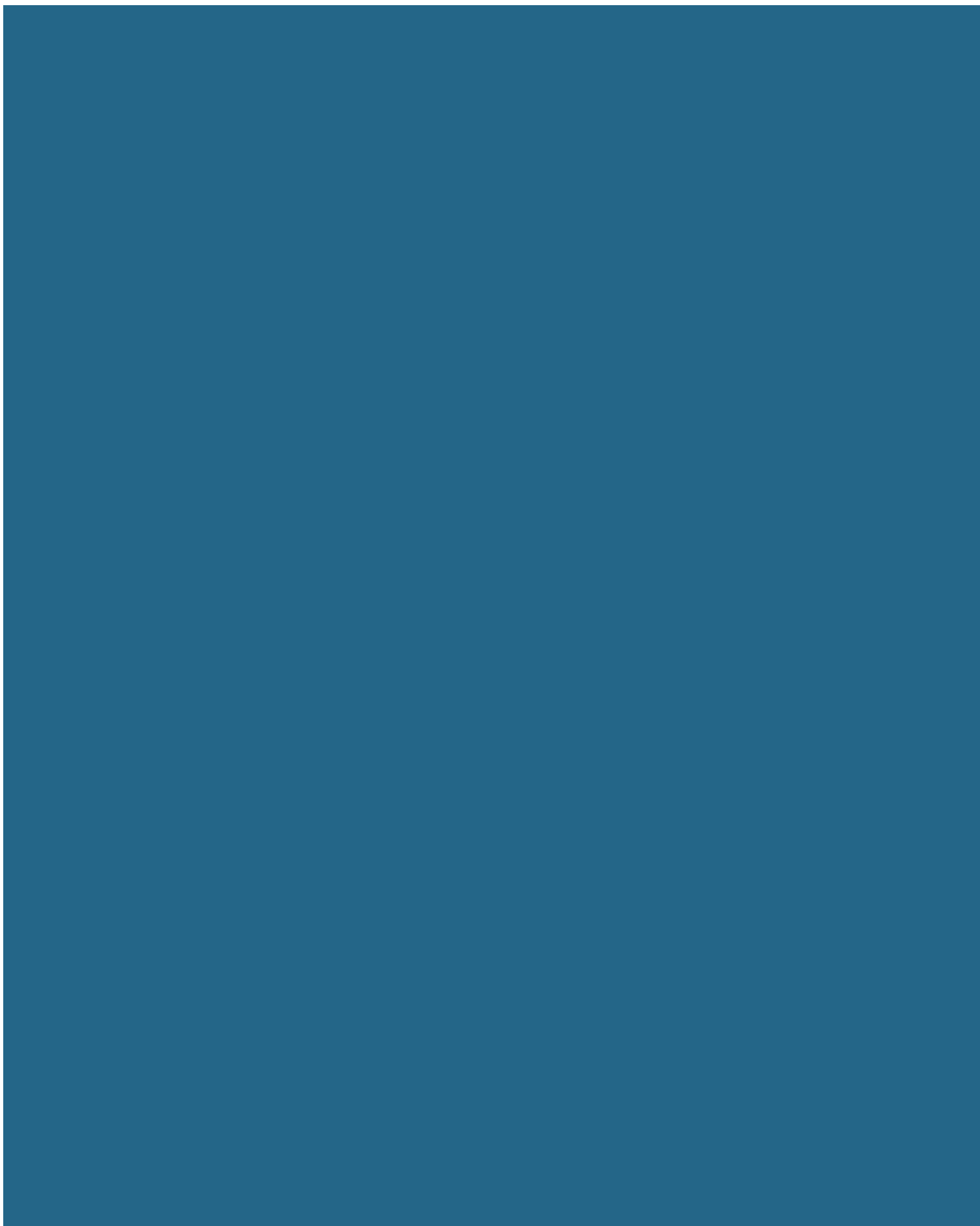
Constructing composite indices to measure qualitative and quantitative indicators and to classify them into different development phenomena can be a controversial issue, and may create reservations concerning resulting in over-simplification of complex phenomena and bias in the selection of index indicators. However, the team emphasized the importance of the indices, and its ability to break down results by dimensions and regions, and its ability to highlight urgent imbalances. Also, it is important to use the same method and tools to assess social phenomena in all regions of Syria, which makes the results comparable. the team conducted several sensitivity tests to assure the robustness of results. Another advantage of this report's method is the test of the relationship between food security and its potential economic, health, educational, demographic and institutional determinants.

Due to the inability to carry out surveys at the household level in the context of population fragmentation and difficult security conditions,

the survey relied upon three key informants with specific characteristics in each region studied, bringing the total number of respondents to 2,100 across all of Syria. Despite the cross-referencing of the results of the three key informants at the regional level, there is potential for bias in the expression of the nature of social relations among the inhabitants of the region. The question of the pre-conflict period may have bias associated with the war, thus exaggerating the positives of the past as well as the possibility of forgetting the true situation before a certain period of time.

It should be noted that analysis at the national or local level does not substitute for detailed case studies of each region according to the importance and priority of research or of specific phenomena. It also does not substitute statistical studies at the level of individuals and households using random statistical samples, which is the next step of the current research, where the focus will be on specific studies in specific areas.

Constructing composite indices to measure qualitative and quantitative indicators and to classify them into different development phenomena can be a controversial issue



CHAPTER 2: THE PRE- CONFLICT POLITICAL ECONOMY OF AGRICULTURE

2.1 PREFACE

Agriculture has been a long-standing activity in Syria since prehistoric times. Fossil evidence suggests the emergence of agriculture and cattle breeding and its transformation into an economic activity that contributed to the development of ancient civilizations from the 10th century BC in the Fertile Crescent (Levatin and McMahon, 2008)

benefitting from the moderate Mediterranean climate and the network of available rivers. The agriculture contributed to the stability of human societies, the growth of culture and the development of religious beliefs and rituals as well as to the establishment of institutions or rules regulating the relations between humans. Agriculture required the regulation of land, crop protection issues and exchange terms as well as cooperation in irrigation efforts and distribution of yields.

The techniques used throughout the ages have been developed through the evolution of methods of agriculture and tools of irrigation and fertilization, as well as the development of trade exchange, benefiting from agricultural surplus. The region also suffered from drought due to the semi-arid nature of the region and climate variability.

Agriculture production remained close to the limits for subsistence for thousands of years until the Industrial Revolution, which caused a shift in production (Maddison, 2003) through the use of machinery. Mechanization (and later automation) in addition to developments in biodiversity science and environmental research, led to expansion in agricultural production at record rates. The results of the Industrial Revolution reached Syria in the early 20th century, leading to an increase in the usage of machinery after independence; yet, some ancient methods and tools, such as the Roman plow, still exist today.

The agriculture sector formed an economic pillar of Syria under the French Mandate and after independence in 1946, but it suffered from lack of investment, marginalization of farmers and neglecting rural areas in general, poor management of natural resources, especially water resources, and heavy dependence on rainfed agriculture as well as repeated years of drought.

After independence, the “leftist” forces and parties expanded, focusing on confronting the exploitation of peasants and workers by “feudal” landlords and the emerging bourgeoisie in major city centers, in addition to expanding the role of the state in securing education and health services and improving infrastructure through the adoption of centralized economic planning. This was reflected in the agrarian reform law of the 1950s in the era of unification with Egypt and was strengthened with the Baath’s accession to power in 1963 and the promulgation of the Agricultural Organization Act in 1964. These radical transformations led to the emergence of central state institutions and increased influence of peasants in political centers. The rural citizens benefited from free education and employment in the public sector (especially the military establishment) and investment in irrigation projects and dams such as the Euphrates dam and the later development of agro-industries.

However, the development model in Syria has suffered from the absence of participation and accountability, the dominance of political tyranny,

Low Equilibrium Development provided infrastructure and basic life necessities such as electricity, supporting major food commodities, free education and health services. Nevertheless, in political terms, there was a denial of participation and accountability, repressive security status, constraining the general knowledge, the weakening of scientific research and the hinderance of high-productive sectors

and continued violence and fighting in the region, beginning with the Israeli occupation and its frequent expansionist wars and conflicts between regional entities, besides, the failure of institutions in balanced and efficient resources management. The extraction of Syrian oil in 1970s and the direct and indirect aid of the oil-producing countries contributed to the emergence of rentier economy, corruption and crony capitalism.

The Syrian Center for Policy Research (SCPR) characterizes the pattern of economic development beginning in the 1960s of last century as Low Equilibrium Development. It provided infrastructure and basic life necessities such as electricity, supporting major food commodities, free education and health services. Nevertheless, in political terms, there was a denial of participation and accountability, repressive security status, constraining the general knowledge, the weakening of scientific research and the hinderance of high-productive sectors. The General Federation of Farmers represented the semi-official agricultural trade union organization established by the Baath party in 1964, which regulates farmers' issues. It is one of the forms of party control over trade unions and cooperatives at the national level, where the cooperative and trade union institutions, as "front organizations" implemented the directives of power and the distribution of benefits and incentives rather than the interests of the societal forces it allegedly represented (SCPR, 2013).

Government Five-Years development plans, beginning with the third one, included expansion of public investment in irrigation and land reclamation projects (especially after the investment in the Euphrates dam), the increase of irrigated and rainy of arable lands, support of the agricultural sector, and the organization of agricultural production by promulgating Law No. 14 of 1975. This laid out the agricultural development strategy and the annual agricultural production plan, as well as the organization of strategic crop pricing and marketing by government institutions thus determining the form, methods, and the size of support provided to farmers. The law addresses the problems and difficulties facing the development of agricultural production and the development of legislation and laws governing it. The subsidy of agricultural crops was adopted through the government's purchase of crops at preferential rates, especially the strategic

crops of wheat, barley, chickpeas, lentils, beets, cotton and tobacco, which resulted in important incentives for farmers to grow these crops. Support was also provided for fertilizers, animal feed. The role of the Agricultural Cooperative Bank and Commercial Bank expanded in the provision of agricultural loans, in addition to providing compensation in the event of major damage to crops. Agricultural credit was increased to enable farmers to acquire the means of production and modern technologies to aid the development of agricultural enterprises, livestock development, subsidized feed and veterinary care and animal health programs were provided and implemented (Katana, 2017; Salem, 2010). In addition, services like agricultural research outputs, guidance and training systems, agricultural education were provided to the farmers.

The 1980s witnessed drastic changes in development policies as a result of the first Gulf War, the cessation of Gulf aid, the Israeli invasion of Lebanon, the events of Hama in 1982 and the Western economic siege, accompanied by waves of drought, which led to a deterioration in agricultural production and deterioration of food security. These factors led to a sharp decline in the performance of institutions, increased corruption, a worsening budget deficit and accelerated rates of internal and external migration. The country had a large deficit in food, including flour, especially after the drought crisis in the late 1980s (Development and Environment, 2014).

The government adopted exceptional subsidy policies for wheat, cotton and beets in order to provide basic foodstuffs and sustain cloth production. These crops spread to large areas, earning farmers their benefits, but at the expense of other vital crops. Medium-term loans for fruit tree planting, which contributed to the expansion of citrus and fruit production, were introduced in the 1990s. Yet the increases in agricultural production during the 1990s was accompanied by major imbalances, notably an emphasis on water-consuming crops such as cotton, beets and wheat, poor irrigation methods, over-exploitation of groundwater and desert tillage, resulting in negative impacts of desertification, soil salinization, loss of biodiversity and bias in subsidies to farmers producing strategic crops. Some of the industries that were implemented in previous periods without accurate studies harmed

The support for strategic crops was in response to the food insecurity crisis of the 1980s, but since the promulgation of Decree No. 35 by the Ministry of Economy in 1986, allowing public-private partnerships, the general trend of economic policy moved towards economic liberalization, which allowed the establishment of public-private partnerships

the environment in a significant way, such as paper and fertilizers factories, as well as cement factories.

The support for strategic crops was in response to the food insecurity crisis of the 1980s, but since the promulgation of Decree No. 35 by the Ministry of Economy in 1986, allowing public-private partnerships, the general trend of economic policy moved towards economic liberalization, which allowed the establishment of public-private partnerships. Later, Law No. 10 of 1991, marking the beginning of economic liberalization, allowed the private sector to invest in all sectors except extractive industries. The government stopped issuing five-years development plans from 1985 to 2000, signaling a shift towards market policy consolidation.

In Syria the agricultural sector is a model of mixed or pluralistic economy, wherein agricultural property and production area domain of the tax-exempt private sector. The role of the state is based around the construction of infrastructure, especially related to land reclamation and irrigation. The government was also involved in agricultural production, support for production inputs, research and training, facilitation of financing and intervention in marketing through the purchase of crops at subsidized prices. Since the 1980s, the role of the state gradually declined, but this trend crystallized clearly in the 1990s as support was lessened and foreign trade was liberalized.

The move towards a phased reduction of agricultural subsidies began with the reduction of number of strategic crops marketed by the government, to five (wheat, barley, cotton, beets and tobacco), with subsidies for feed and fertilizer production.

The government continued support to farmers by providing services to assist in the development and

improvement of production while encouraging the private sector to increase investment (Katana, 2017).

In the 1990s, there was an increase in capital invested in agriculture, along with technological development and the expansion of cultivated and irrigated land (as the report will discuss later in detail). This has led to an increase in agricultural and animal production. The production exceeded the local demand for many crops, whether for household consumption or for the industrial sector, leading to the exportation of agricultural surplus. The industrial sector linked to agriculture also developed, notably textile and food industries (Katana, 2017).

However, desert cultivation and overgrazing, led to the deterioration of the natural pastures in Al-Badia and the acceleration of desertification as a result of the Government's decision in 1990s to allow the cultivation of Al-Badia lands.

This law was finally suspended by Al Badia Law in 2006. The uncontrolled use of water and illegal drilling of wells, as well as the use of conventional irrigation methods, led to the deterioration of the water balance. The export of raw agricultural materials also resulted in the loss of value added from manufacturing processes (Westlake, 2001; Najafi et al., 2010; Katana, 2017). The focus on water-consuming crops and the attempt to shift to modern irrigation has increased land salinization and water deficit, resulting in significant losses in natural resources and land productivity. It is estimated that 530,000 hectares of land in the Euphrates basin, equivalent to more than 40 per cent of irrigated land area in Syria, are affected by different levels of salinity (General Commission for Scientific Agricultural Research, 2015).

Since the 1980s, the role of the state gradually declined, but this trend crystallized clearly in the 1990s as support was lessened and foreign trade was liberalized

In the new millennium, neoliberal economic policies were expanded through gradual liberalization of energy prices, expansion of the role of the private sector, decline in public investment, gradual withdrawal of many forms of support such as public health services

In the new millennium, neoliberal economic policies were expanded through gradual liberalization of energy prices, expansion of the role of the private sector, decline in public investment, gradual withdrawal of many forms of support such as public health services, and expansion of trade openness. The new economic structure led to a rise in prices and the cost of living, the absence of social protection, especially for farmers and workers in the unorganized sector, and a decline in job creation in productive sectors, especially agriculture. Poverty increased and real estate has become the vanguard sector. The country experienced two waves of sharp real estate speculation in the first half of the 1990s and then in the new millennium, opening the door to 'war' on agricultural land. This greatly affected the structure of the economy and contributed to promoting rural-to-city and out-country migration.

Economic reform policies were adopted as part of a neoliberal approach to price liberalization and free movement of capital, but they were not accompanied by institutional reform, accountability, law enforcement and control of corruption. Although the Ninth Five-Year Plan (2001-2005) and the Tenth (2006-2010) included a shift towards a social market economy, including a focus on productivity enhancement and investment in human capital, technology and knowledge, implementation focused on economic liberalization.

Plans that aimed at a poverty reduction in the most deprived rural areas, such as the countryside of Aleppo and Al-Jazeera, in fact widened and marginalized many social sectors, including farmers. The sectors that boomed under neoliberal policies, those of finance and real estate did not create many jobs. The former developmental stability (implicit social contract) was dismantled, and coupled with the absence of alternative policies, caused a reduction of farmers' status, as their political role or voice was not increased in public life or in power. The modest government response to the 2008-2009 drought exacerbated the marginalization of agriculture and farmers: approximately 60 thousand families from the eastern region forced to flee to the Damascus countryside and Daraa.

During the period 2000 to 2010, a decline in oil production contributed to the search for alternatives to compensate for the contribution of oil to

production, exports and public revenues, but the change in development policies was limited to economic liberalization measures, without a radical change in institutions and without addressing the imbalances associated with inefficiency, corruption and exclusion. These factors were reflected in the expansion of the informal sector and the expansion of economic and social inequality, which benefited the influential elite in the so-called crony capitalism and focused attention in the sectors of communications, banks and real estate in return for decline in agriculture.

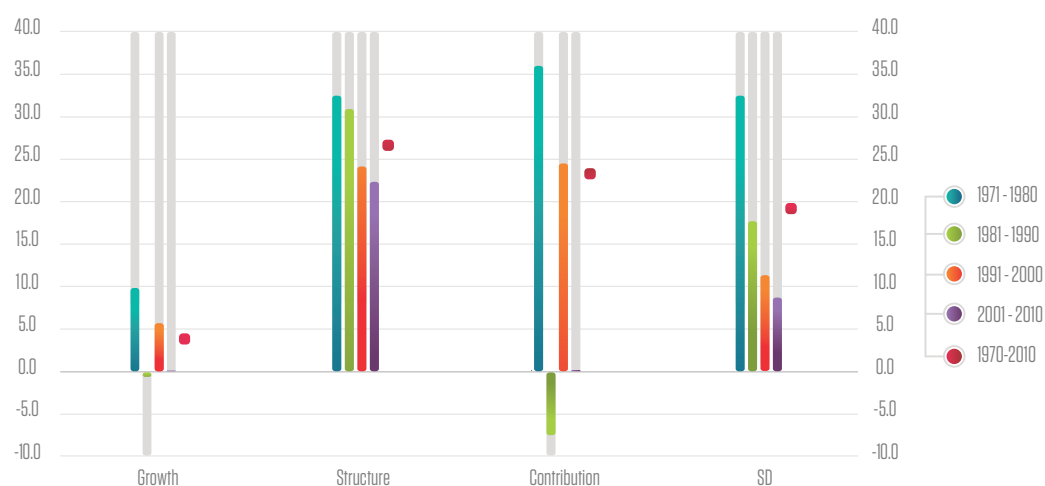
During the period 2000 to 2010, a decline in oil production contributed to the search for alternatives to compensate for the contribution of oil to production, exports and public revenues, but the change in development policies was limited to economic liberalization measures, without a radical change in institutions

2.2 Contribution of agriculture to the Syrian economy before the conflict

Since 1970, the economy achieved relatively high economic growth rates according to the available data. The average annual growth rate for the period 1970-2010 was approximately 5.6 per cent, and the average annual population growth rate for the same period was approximately 3 per cent, i.e. the per capita GDP grew at an annual growth rate of about 2.6 per cent.

The agricultural sector plays a vital role in the Syrian economy. The average annual growth rate of the agricultural sector reached about 3.9 per cent with a contribution to the total growth of about 23 per cent. In addition, the agricultural sector has a rich interlinkage with other sectors such as food, textile, construction, construction and utilities (Figure 1).

Figure 1: GDP of the agricultural sector in Syria 1970-2010: growth, structure, contribution to total growth and standard deviation.

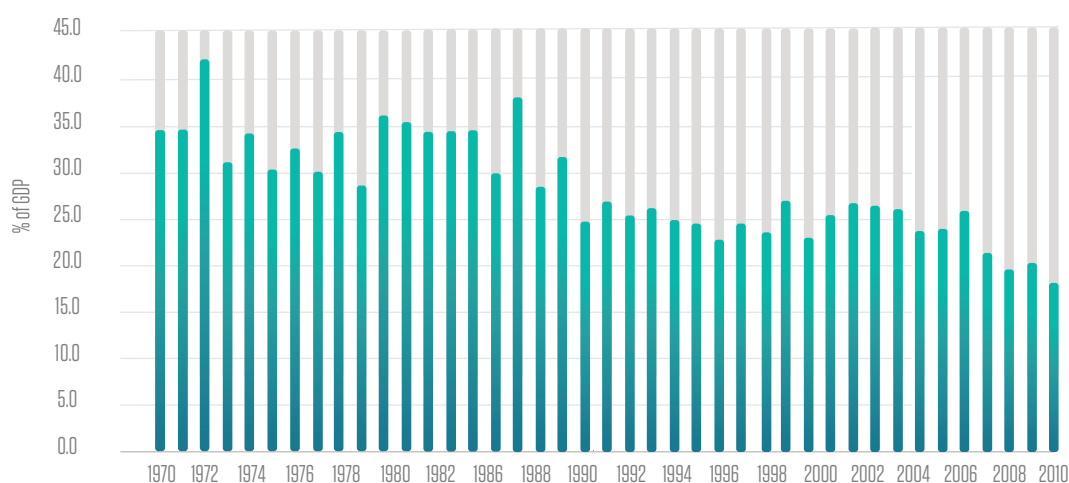


Source: Central Bureau of Statistics - Syrian Center for Policy Research

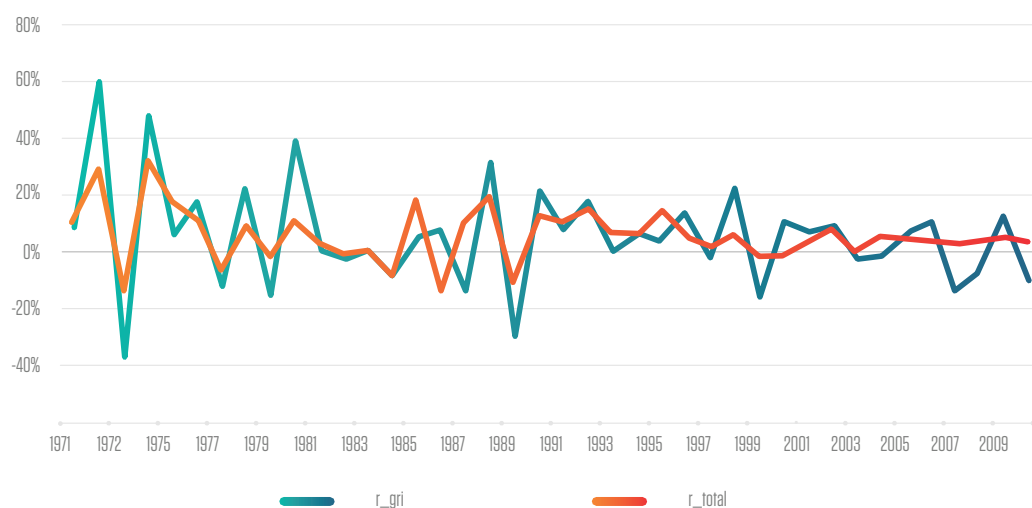
Figure 2 shows that the share of the agricultural sector has declined significantly since the 1970s, reflecting the traditional structural shift in developing economies where growth rates of industrial and service sectors accelerate at a faster pace than the agriculture sector, which is limited by land and environment conditions. The sector share of GDP fell from 33 per cent in the 1970s to about 22 per cent in the first decade of the new millennium, reaching 17 per cent in 2010. The economic growth of the agricultural sector is highly volatile, with the sector growing by 10 per cent in the 1970s but

declining in the 1980s. The average growth rate for this period was negative and returned to a positive growth rate of 5.7 per cent in the 1990s but became close to zero in the first decade of the millennium. Both the sectors' contributions to GDP growth and the standard deviation of growth rates show that these severe agro-economic crises in the 1980s and the first decade of the millennium are influenced by climate conditions on the one hand and general policies (economic, agricultural, social) on the other (Figure 3).

Figure 2: Share of agriculture GDP of total GDP 1970-2010



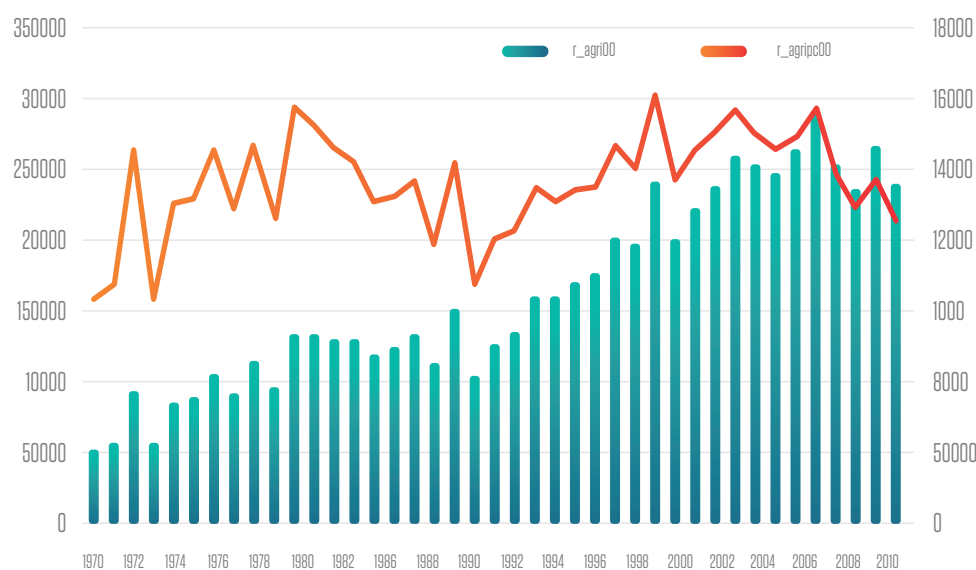
Source: Central Bureau of Statistics - Syrian Center for Policy Research

Figure 3: Overall GDP growth rate and growth of agriculture sector, 1971-2010

Source: Central Bureau of Statistics - Syrian Center for Policy Research

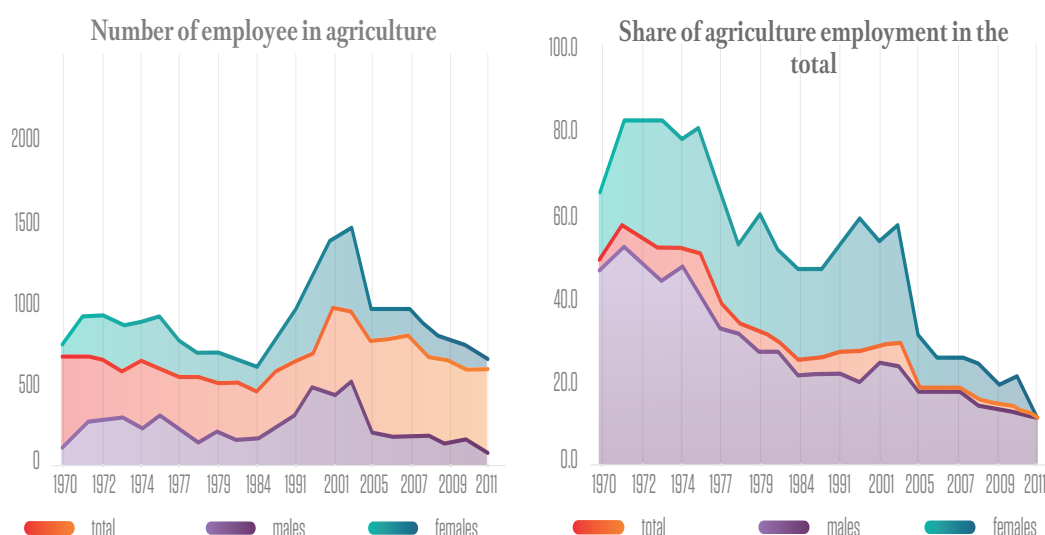
Figure 3, shows the strong correlation between volatility of GDP growth and the agricultural sector growth, and despite the stability phase of the 1990s, the results show that the volatility of the sector have returned in the new millennium, as a consequences of the inability to expand the implementation of modern irrigation, the continuation of excessive water consumption and the decline in agricultural subsidies, and the inability to create alternative work in high-productivity sectors.

Although agricultural output doubled about four times during the 1970-2010 period, agricultural growth rates were associated with population growth rates; as a result, the per capita agricultural production did not increase. It is worth mentioning that population growth rates declined from 3.3 per cent in the 1970s to 2.7 per cent in the 1990s with a decline in fertility rates that slowed down by the end of the decade and the population growth rate returned to 2.9 per cent in 2010 (Figure 4).

Figure 4: Agricultural GDP and per capita agricultural GDP at constant prices, 1970-2010

Source: Central Bureau of Statistics - Syrian Center for Policy Research

Figure 5: Number and share of employment in agriculture by gender for the period 1970-2010



Source: ILOSTAT and Syrian Center for Policy Research calculations

Figure 5 shows that the share of agricultural employees in the Syrian economy declined from about 50 per cent in 1970 of the total employees to about one third in the early 1980s and about a quarter in the early 1990s. During the 1990s, the share of agriculture employees increased to 30 per cent. In the first decade of the millennium, the share of agricultural workers fell sharply to about 14 per cent in 2010.

Paradoxically, the number of employees in the agricultural sector increased to a peak in 2002 of about 1440 thousand employees, including 508 thousand females, but the last decade witnessed a sharp decline in the number of workers in the agricultural sector even before the last drought in 2007-2008. That brought, the number of workers in the sector to 655 thousand male and female workers, lower than the number of workers in agriculture in 1970.

This decline affected the livelihoods of rural families and low-skilled workers and contributed to the reduction of their participation in the labor force. This reflects a decline in the priority of the agricultural sector and in the role of farmers and rural people in public policies without an economic alternative that creates jobs and reduces poverty. Overall it shows a lack of development balance.

Figure 6 shows a trend of the decline in public in-

vestment and increase of private investment during the period 1996-2010, reflecting the economic policies that focused on reducing public investment according to a neo-liberal approach. Although the development plans developed by governments in the last decade paid lip-service to increasing public investment efficiency and size, the implementation was in the opposite direction. Private investments increased at a high rate in the first decade of the millennium and exceeded public investments for the first time in 2007. These private investments went to the investment in equipment and machinery, in contrary, there was a small contribution of private investment in construction. On the other hand, public investments mostly went to construction, which shows the integrated roles between the private and public sectors.

The sharp drop in public investment with the drought years and the failure of a shift to drip-irrigation have made public investment policy a contributing factor to the decline of agriculture rather than helping the sector and farmers overcome this critical stage. The estimations of the capital stock in the agricultural sector shows that it was a public capital stock, which concentrated on irrigation and reclamation projects, was more than three times of the capital stock of the private sector.

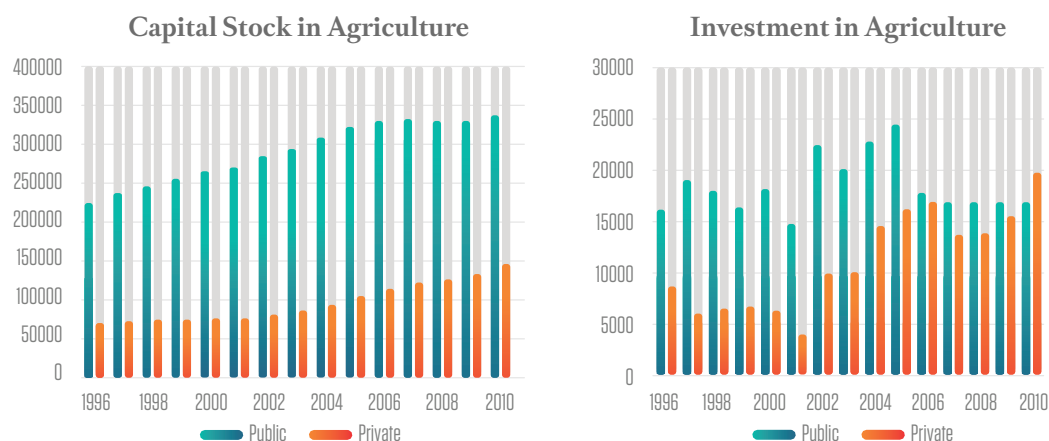
Furthermore, most of the agricultural production,

In the first decade of the millennium, the share of agricultural workers fell sharply to about 14 per cent in 2010

The first decade of this millennium witnessed a sharp decline in the number of workers in the agricultural sector even before the last drought in 2007-2008. That brought, the number of workers in the sector to 655 thousand male and female workers, lower than the number of workers in agriculture in 1970

Private investments increased at a high rate in the first decade of the millennium and exceeded public investments for the first time in 2007. These private investments went to the investment in equipment and machinery, in contrary, there was a small contribution of private investment in construction.

Figure 6: Public and private investment in agriculture at constant prices 1996-2010



Source: Central Bureau of Statistics - Syrian Center for Policy Research

except irrigation, is carried out by the private sector, and the last decade witnessed an increase in the accumulated investment of this sector, while the public investment rates did not exceed the depreciation rate of public capital stock in agriculture (see figure 7).

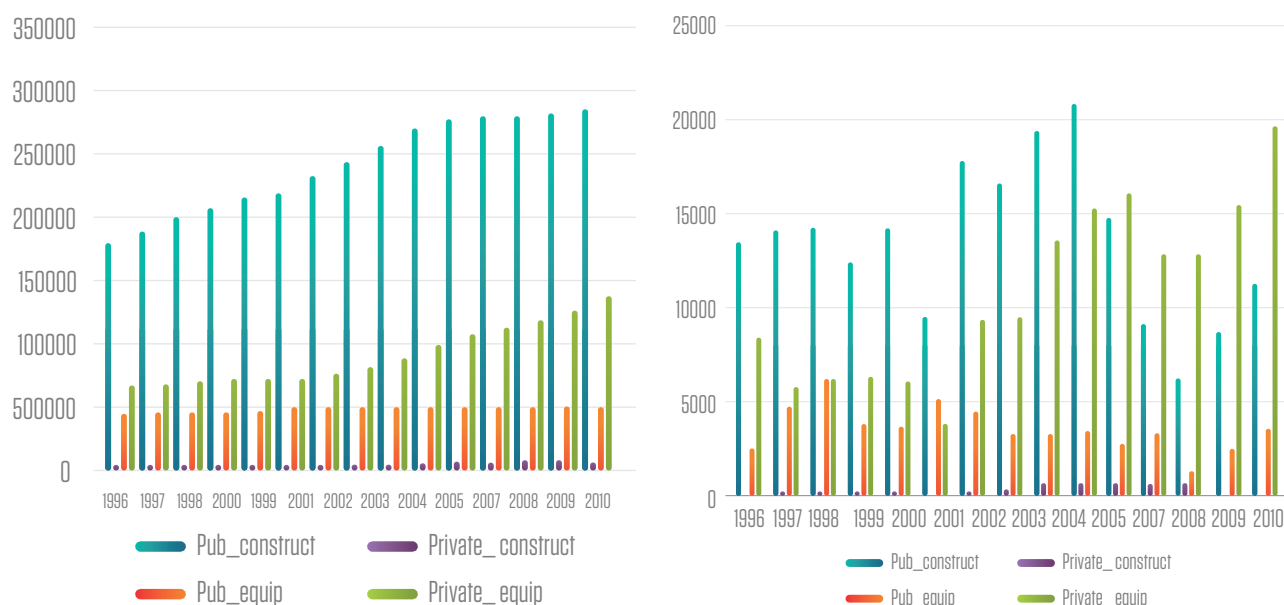
2.3 Internal Migration

Public policies governing agricultural sector have a direct impact on the geographical distribution

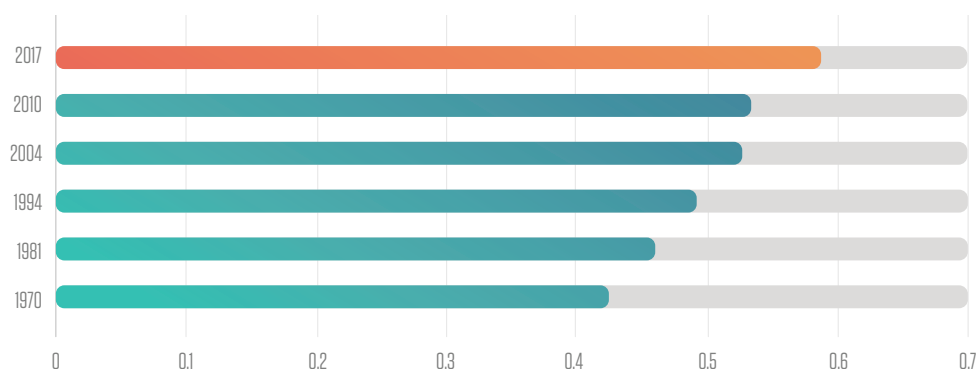
of the population, notably the trend of migration from rural to urban. Figure 8 demonstrates that the proportion of urban population rose from 43 per cent of the population in 1970 to 54 per cent of the population in 2010, accompanied by the relative decline in agricultural employment and production rates.

The richest areas in terms of agricultural production, especially the eastern and northern regions (excluding Aleppo city) were the most deprived

Figure 7: Structure of public and private investment in agriculture between construction, development and equipment



Source: Central Bureau of Statistics - Syrian Center for Policy Research

Figure 8: Share of urban population in total population, 1970-2010

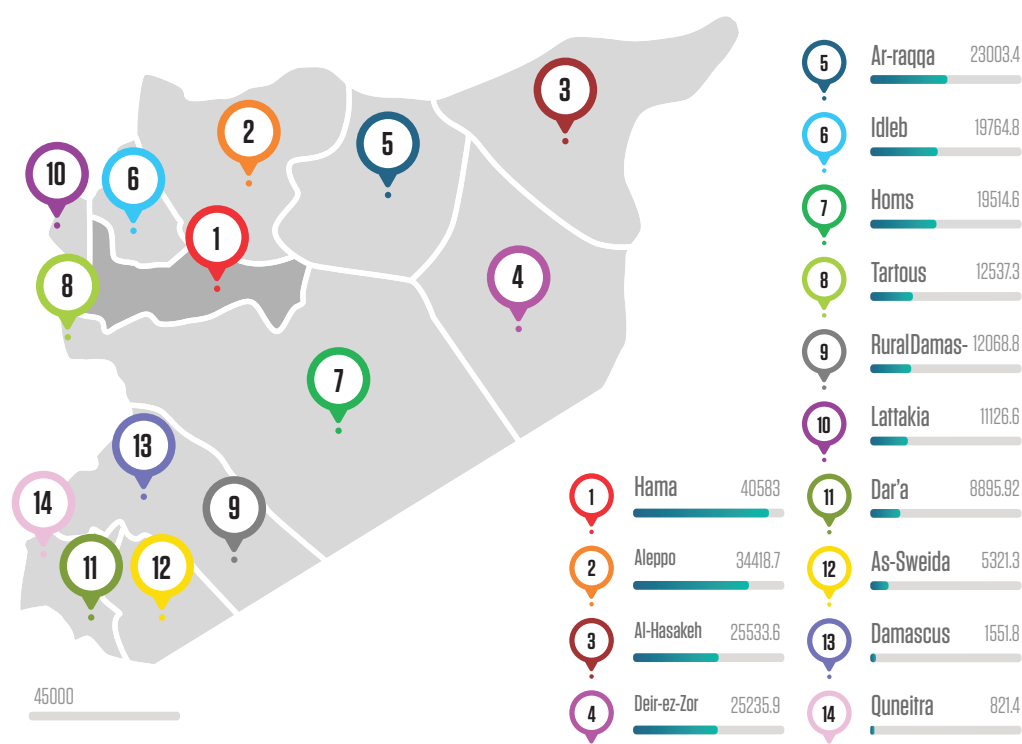
Source: Central Bureau of Statistics - Syrian Center for Policy Research

areas in Syria in terms of various developmental indicators such as education, health status, and poverty.

These disparities encouraged rural migration and a gradual decline in participation in the agriculture sector, supported by public policies that favored the service sectors at the expense of productive sectors.

Plant production (especially grains) is mainly concentrated in the eastern region and the Aleppo countryside, and animal production is concentrated in Hama, the eastern region and Aleppo.

The disparity in agricultural production is affected by the availability of agricultural land, the availability of water and the labor force, as well as public policies and the concentration of investment (Figure 9).

Figure 9: Agricultural GDP at constant prices by governorates in 2010

Source: Central Bureau of Statistics - Syrian Center for Policy Research

Comparison of the national extreme poverty line and the total wage of workers in the agriculture sector reveals that 58 per cent of them live in extreme poverty if they rely on wage work in agriculture with the overall poverty line, 72 per cent of the agriculture workers are poor; the majority of agricultural workers and their families suffer from poverty as a result of low wage

2.4 Poverty levels for agriculture workers

For men and women, work in agriculture associates with informality, as it was usually seasonal work, lacking social protection and decent working conditions, including the absence of contracts and security. Unpaid labor was particularly endured by females. Analysis of wage levels in the agricultural sector reveals they are very low compared to both the poverty lines and the average wages at the national level, thus making agricultural workers especially vulnerable to poverty, exploitation and marginalization. The analysis of the 2009 Labor Force Survey shows that the wages of primary and secondary labor for agricultural workers are the second lowest in the national economy; wages in home services are the lowest. Comparison of the national extreme poverty line and the total wage of workers in the agriculture sector reveals that 58 per cent of them live in extreme poverty if they rely on wage work in agriculture. In comparison with the

overall poverty line, 72 per cent of the agriculture workers are poor; the majority of agricultural workers and their families suffer from poverty as a result of low wage levels (Table 1).

The bargaining power and active participation of workers in the agricultural sector have declined consequent to economic policies that emphasized a service economy, and declining role of the state, as neoliberal policies have reduced support without improved social protection or working conditions for men and women in the food sector. The exclusive model of development and the policies that promoted inequality have led to expansion of deprivation and reduced opportunities for participation in productive sectors. Ignoring environmental sustainability has also led to the deterioration of natural resources. These factors have made the available food availability unstable and unsustainable.

Table 1: Prevalence of poverty by economic activity in case of dependence on wages as the sole source of income for 2009

Economic sectors	General Poverty Rates	Extreme Poverty Rates
Real estate brokerage, rent	24.10%	43.50%
Education	24.10%	42.70%
Health, social work	28.80%	44.40%
Financial brokerage	33.80%	46.20%
Mining	34.40%	46.40%
Electricity, gas, water	37.90%	63.60%
Wholesale and retail trade	42.70%	61.10%
Transport, storage, telecom	43.40%	67.40%
Public administration, defense	45.00%	66.80%
Country average	45.90%	64.60%
Hotels and restaurants	46.10%	68.00%
Manufacturing industries	46.80%	67.50%
Social services	54.10%	70.60%
Construction	55.00%	71.00%
Agriculture, forestry, hunting	57.90%	72.50%
Home services	62.00%	82.90%

Source: Labor Force Survey 2009 Central Bureau of Statistics - Syrian Center for Policy Research



CHAPTER 3

FOOD SECURITY IN SYRIA

3.1 INTRODUCTION

Many surveys and studies have been conducted on food security in Syria, mostly by UN organizations such as FAO, WFP, UN Office for Humanitarian Affairs (OCHA). One study (FAO study) undertaken in collaboration between FAO and WFP in 2018 concluded that the food security situation in Syria has improved in many parts of the country due to improved security and access to markets. However, the overall situation is still deteriorating in areas where there is conflict.

This study relied on sources collected through focus groups composed of key informants and “representative” family interviews covering 6,012 households to obtain the ‘Mobile Vulnerability Analysis and Mapping Data (mVAM)’ to study and analyze the level of vulnerability to food insecurity. The mission estimated the proportion of vulnerable households in food deficit through two indicators: Food consumption and asset exhaustion strategies. The results showed that the proportion of the most fragile households fell by 13 per cent between October-June 2018 compared to the same period the previous year. The study was based on an assessment of the quality and quantity of food based on food expenditure, as well as the measurement of macro- and micro-nutrients. The study also created a measure of the level of pressure on households through the reduced Coping Strategy Index (rCSI), which consists of five adaptation strategies (reliance on less favored and less expensive food, food borrowing and dependence on relatives and friends, limited meat quota, restricting adult consumption for feeding young children, and finally reducing the number of meals per day). The results showed that adaptation remained high, at a rate of 24 per cent among households who adopted an adjustment system to cope with food shortages (FAO & WFP, 2018).

In the OCHA briefing report and in the report on humanitarian needs (HNO) 2018, the number of

food insecure Syrians was estimated at 6.5 million; with a further 4 million at risk of food insecurity

, accounting for 54 per cent of the population inside Syria. According to the study, compared with the previous year, the number of Syrians suffering from severe food insecurity has declined from 37 per cent to 33 per cent, but the number of those exposed to the risk of access to this situation has doubled. Three factors led to this result: lack of security, lack of financial resources and limited access to food (WoS-Food Security Sector, 2017).

These important studies face several challenges, including the use of necessarily inconsistent tools such as focus groups and family interviews, without explaining how the results are integrated into the FAO study. In addition, household surveys suffer from major obstacles, including the absence of a survey framework due to massive population movements and the lack of a reliable census or estimates of the population. Moreover, the inability to reach many areas makes the results biased. In terms of food security, fear of providing information at the family level within conflict conditions affect the responses of families concerning their resources or personal security in the place of residence. In addition, the organizations conducting the study provide humanitarian assistance, often directly, thus creating potential levels of bias in the responses. In the OCHA study, it solves the

issue of family biases through key informants at the population community level and covers most areas. However, the methodology of choosing of participants suffers from the variety of survey operators and unclear criteria for key informants, for example the key person can be a UN employee or part of an organization that receives aid from the surveying organizations. The study does not select more than one key informant for each region to ensure that there is no bias in the answers. Finally, the food security studies focus on aspects of supply-related security, sometimes related to supply or use, but does not cover all aspects of food security from availability, access, use and sustainability.

In order to overcome some of these challenges, this research is based on a complete survey of the whole of Syria. It was implemented by the choice of key informants according to specific criteria and the selection of at least three persons in each region. The results were also compared with the available secondary data to limit the bias of answers. The survey is designed to cover key aspects of food security and includes several specific determinants

of food security, such as war economies, access to public services, levels of violence, social relations and institutional performance.

3.2 Food Security Index

A composite index of food security has been developed based on the concept of food security presented in the Methodology section and based on the results of the Population Status Survey, which measures the state of food security at the local level (698 areas covering the whole of Syria) and the national level for 2014 (Annex 1 provides a detailed explanation of the methodology Population Survey). The research team then used the available secondary data and expert estimates to cross-reference the results and subsequently to implement projections for 2018. The food security index consists of four main dimensions: availability, accessibility, utilization, and sustainability, and measures the food security situation before and during the conflict. Indicators in the survey were used to measure these four dimensions as shown in Table 2.

Table 2: Dimensions of the Food Security Index

composite index	sub-indices	dimensions of sub-indices	weighting	projections 2018
Food Security Index	Availability	The availability of basic foodstuffs	%25	Animals and Plants Production
	Access	The ability to get the basic foodstuffs	%25	Food security surveys and Human Needs Reports
	Utilization	The Quality of food	%7.5	Nutrition Survey
		The availability of drinking water	%7.5	Water production
		The availability of cooking Gas	%2.5	The consumption of house gas
		The Structure of Food	%7.5	Nutrition and food security surveys
	Stability	The sources of basic foodstuffs	%12.5	Imports
		The source of Income	%12.5	GDP and Poverty rates and the extent of the aids dependency

The following is an explanation of the indicators used to build the index:

- **Availability:** The level of availability of basic foodstuffs. To study the level of availability of food, the questionnaire included a question about the availability of the basic foodstuffs with three options. Each option includes “pre-conflict” and “conflict” choices. The assessment of the availability of basic foodstuffs (bread, cereals, vegetables, fruits, meat, dairy and cheese): that “bad” indicates insufficient quantitative availability of basic food items for most individuals. “Medium” indicates the quantitative availability of foods for some individuals, and “good” refers to the quantitative availability of foods for most individuals. The missing items and unavailability reasons were explained by the key informants.
- **Access :** Access to food. To study the level of access to food, the questionnaire included a question about the degree of household access to basic food items so that three of the options are answered. Answers include one “pre-conflict” option and one “conflict” option, rated by three levels: “bad” indicates most households are unable to obtain basic food items. “medium” refers to the ability of some households to access basic food items. “good” indicates that most households have access to the main food items. The explanation includes the reasons for the lack of access to the main foodstuffs and whether the household relies on the purchase of food or humanitarian aid.
- **Utilization :** To study the level of utilization, a set of indicators that reflect the quality of food for humans was developed as follows:
 1. Quality of food: To examine the quality of basic foodstuffs (bread, cereals, vegetables, fruits, meat, dairy and cheese) before and during the conflict, the questionnaire included a question about the quality of the basic foodstuffs so that the answer is one of three options: “bad” indicates terrible quality of staple foods, “middle” refers to the acceptable quality of most basic food items for a portion of individuals, and “good” refers to the good quality of most of the main existing foods. The explanation part asks the reasons for the poor quality such as storage, transportation, production and other problems.
 2. Drinking water availability: The respondent is asked to distinguish between a pre-conflict period and a conflict period. Water is considered “bad” if there is no access to water due to the lack of access to water through the public network and water is not suitable for drinking needs requiring sterilization and filtering, and so people relied mainly on alternatives such as tank water for most of the housing area considered. “Middle” refers to the occasional availability of improved water in the region, “good” means there is improved water regularly available in most of the area. The explanation section asks the reasons for the terrible quality of water (if any) and the reasons for the difference between the pre-conflict area and during the conflict (if there is any difference), in addition to the cost of access to improved water.
 3. Cooking gas availability: One choice is made for a pre-conflict period and one is for the duration of conflict. The situation is considered to be “bad” if there is no way to obtain cooking gas and alternative sources such as firewood are used for most of the housing in area under study. It is “medium” if there is insufficient cooking gas and intermittent cooking gas for most of the studied area, and “good” for adequate and systematic cooking gas in most of the dwellings in the area. The explanation section asks the reasons for the lack of gas (if any) and the reasons for the difference between pre-conflict and conflict (if any).
 4. Proportional composition of food consumption: The percentage of the share of each major food group in the total food consumption of households, the total should be equal to 100 per cent.
- **Sustainability and stability of food :** This indicator is studied through two main indicators:
 1. Proportional composition of income sources: The percentage of each food group’s share of total food consumption of households should be equal to 100 per cent for both “pre-conflict” and “during” conflict.

2. Proportional composition of food sources:
Includes the percentage of the share of each major food source from the total supply of these substances, equal to 100 per cent for each “pre-conflict” and during conflict.

3.2.1 Building the index

The indicators were weighted in the overall index based on the literature for similar studies and on expert consultations. The research applied simple formulas that rely on equal weighting of the main dimensions. In utilization dimension, food quality, structure and drinking water were equally balanced within the dimension (30 per cent each) and cooking gas was weighted by 10 per cent. In the sustainability dimension, the relative composition of sources of income and food sources were weighted equally (50 per cent). The dimensions were built after all the indicators were mapped to values between zero and one, in addition to the weight of the population of the studied area, when aggregated at the governorate level and at the national level. The four dimensions took values between zero and one to build the food security index as follows:

$$FSI_t = \frac{1}{4} (AV_t) + \frac{1}{4} (AC_t) + \frac{1}{4} (UT_t) + \frac{1}{4} (ST_t)$$

As:

FSI_t Food Security Index takes a value between zero and one, where zero reflects food insecurity and one means best performance.

AV_t Availability dimension and takes a value between zero and one.

AC_t Access dimension takes a value between zero and one.

UT_t Utilization dimension takes a value between zero and one.

ST_t Stabilization dimension takes value between zero and one.

In a subsequent step, the food security index and its dimensions in 2018 were presented at the national level based on secondary data indicating the status of the sub-indicators or determinants of food security, which are indicative results.

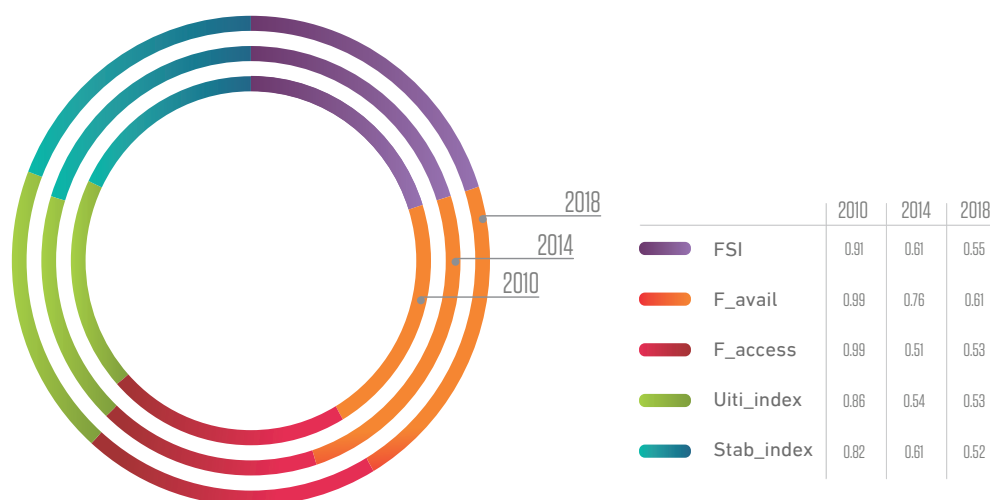
3.2.2 Food Security Index

The results of the food security index show that Syria had high levels of food security prior to the conflict, but the dimensions of the index indicate that the strengths are availability and accessibility while the utilization, stability or sustainability of the food suffers due to poor sources of income and unsustainable use of natural resources.

During the conflict, Figure 10 shows a sharp decline in the level of food security by about 34 per cent between 2010 and 2014, reflecting the catastrophic effects of the conflict on the denial

There was a sharp decline in the level of food security by about 34 per cent between 2010 and 2014, reflecting the catastrophic effects of the conflict on the denial of food security to the population. All dimensions of the food security index declined, but the most significant decline was access to food at about 48 per cent

Figure 10: Food Security Index and its four dimensions at the national level for 2010-2014-2018



Source: Population Status Survey - Syrian Center for Policy Research projections

of food security to the population. All dimensions of the food security index declined, but the most significant decline was access to food at about 48 percent, affected by the siege and restrictions on the movement and the decline in purchasing power. This was followed by a decrease of 37 per cent, 25 percent and 23 percent, respectively.

In the period 2014–2018, the index fell by about 8 per cent, although the access dimension improved by about 3 per cent as a result of the decline in the siege, but the availability, stability and utilization dimensions fell by 20 per cent, 14 per cent and 1 per cent, respectively.

The catastrophic results at the national level reveal considerable variation among regions.

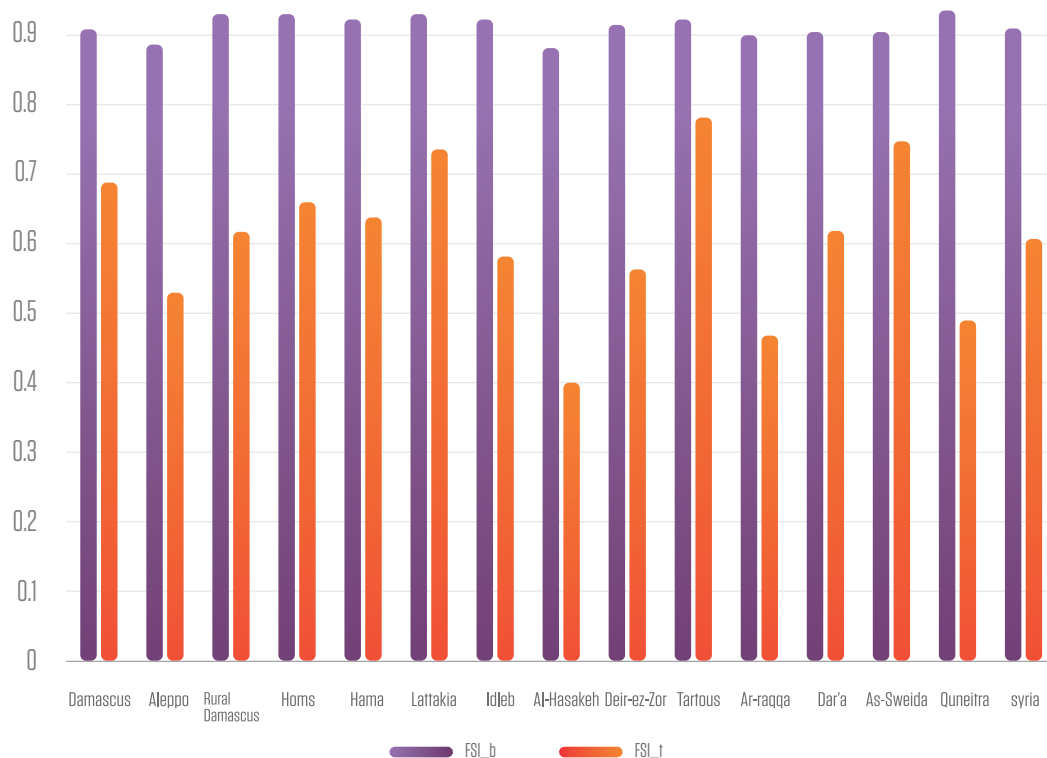
Figure 11 shows the severity of the deterioration in the food security index in Al-Hasakah, Ar-Raqqa,

Aleppo, Quneitra, Deir el-Zour and Idleb, which declined at rates greater than the national average.

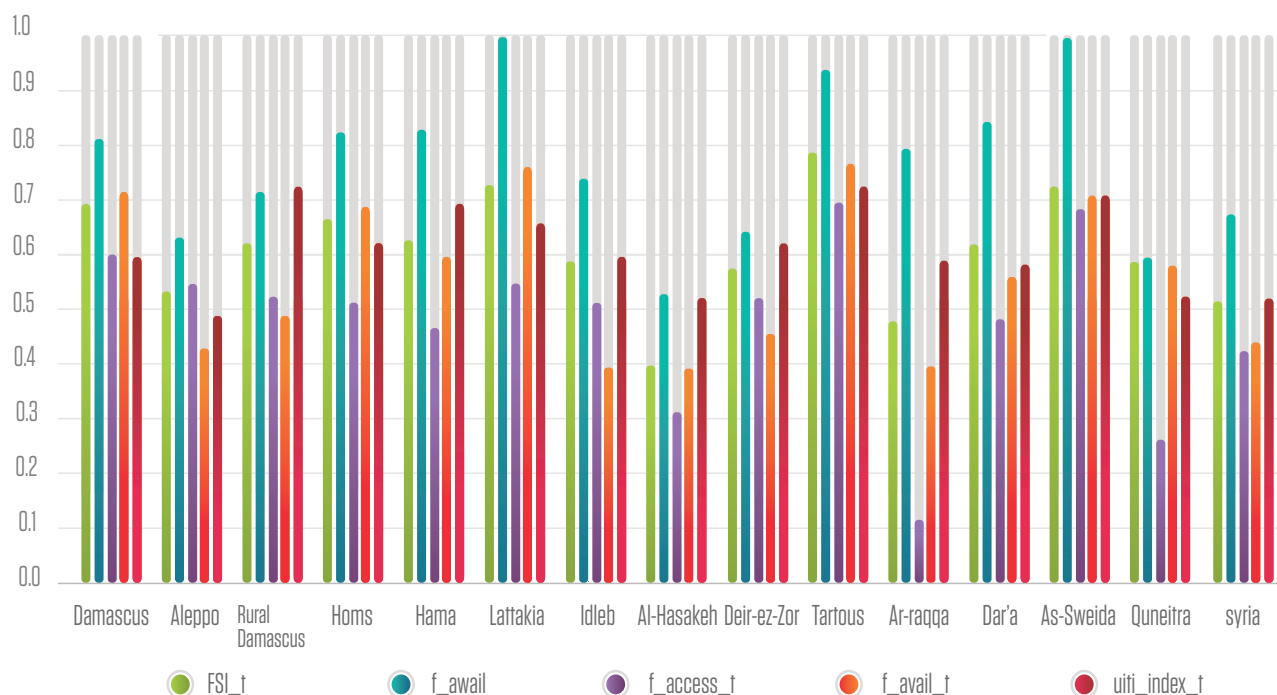
These governorates have witnessed an intensification of military operations and widespread violations compared to other provinces. The governorate averages also mask disparities at the local level, with regions such as East Ghouta, Al-Rastan and neighborhoods of Deir el-Zour and Aleppo suffering the most from the minimum level of food security.

At the governorate level, Figure 12 shows the suffering of different populations in terms of the access dimension, for example in Ar-Raqqa, Al-Hasakeh and Quneitra. Although some governorates enjoyed high levels of availability such as Lattakia, Sweida and Tartous, access levels were much weaker.

Figure 11: Food security index at the governorate level for 2010–2014



Source: Population Status Survey – Syrian Center for Policy Research projections

Figure 12: Food security and its dimensions at the governorate level in 2014

Source: Population Status Survey - Syrian Center for Policy Research projections

3.3 Availability of food

The food availability index declined significantly during the conflict in the entirety of Syria, where the percentage of those who responded that it was sufficiently available to most households declined from 97 per cent before the conflict to 60 per cent during the conflict. The results showed disparities between the Syrian regions and governorates, and that the suffering was concentrated in the areas that witnessed an intensification of hostilities and siege conditions.

The results showed that the non-government-controlled areas of Al-Hasakah, Aleppo, Deir el-Zour and Idleb endured the greatest difficulties in terms of food availability for most families. Siege was one of the most frequent reasons cited for the lack of food, as well as subjugating powers preventing the supply of food, thus encouraging smuggling and raising monopoly rates. On the other hand, the government-controlled governorates of Lattakia, Sweida and Tartous had foodstuffs at reasonable availability. The main food supply factors are discussed below.

3.3.1 Supply factors

3.3.1.1 Climate conditions

Climate conditions affect agricultural production significantly, as more than two thirds of Syria's agricultural land is rainfed. The region has always experienced weather fluctuations. Studies have shown that the overall trend of global warming in the region is consistent with global warming models affected by human activity and agriculture and economic activities based on high-carbon energy sources, therefore, drought periods can no longer be attributed to natural change alone. In addition to drought and climate change, Syria has faced the emergence of new diseases, including wheat rust disease. This has led to a decline in food security for the population of the Badia region and the northeastern region in the governorates of Al-Hasaka, Ar-Raqqa and Deir el-Zour. The region experienced major droughts in the 1950s, 1980s and 1990s, yet the 2007-2009 drought was the worst. The country was affected by this drought, which hit the north-east, leading to a decline in agricultural production, which is usually about a quarter of the

The results showed disparities between the Syrian regions and governorates, and that the suffering was concentrated in the areas that witnessed an intensification of hostilities and siege conditions

gross domestic product, resulting in the death of a large number of herds, especially sheep, and a doubling of grain prices (Selby et al. 2017, Kelly et al. 2015). The country has not experienced a severe drought during the 2011-2018 conflict.

3.3.1.2 Cultivable lands

The arable land accounts for 33 per cent of the total area of Syria, 70 per cent of which is dependent on rainfall and 90 per cent of this area has a rainfall rate of less than 300 mm per year. This is the minimum required to complete the winter crops for their agricultural life cycle. The remaining 30 per cent of the cultivated area is irrigated.

In spite of their scarcity agricultural lands have been subject to encroachments over the last 30 years, particularly since 2000, by the construction of residential buildings and industrial, crafting and service facilities due to a lack of regulatory zoning and plans to meet the population needs and the requirements of industrial and business development. During the conflict in 2011-2016, the encroachment on agricultural land was devastating and resulted in the removal of fertile lands and reclaimed land within the government irrigation schemes of agricultural investment. Meadows, pastures, forest and grazing areas were also subject to large amounts damage by burning and cutting during the conflict, resulting in massive environmental devastation and the loss of vegetative cover required for animal resources (Katana, 2017).

According to the Ministry of Water Resources, out of 4.6 million, 1.6 million hectares can be irrigated. It is estimated that less than 500,000 hectares were irrigated during 2017 and 2018, of which 300 thousand were irrigated from public networks. Most irrigation-based fields suffer from a low level of watering, either because of the intermittent availability of water or because farmers cannot afford fuel or energy to run their pumps at the frequency required to provide adequate irrigation. Al-Hasakah farmers confirmed that their fields were irrigated twice instead of thrice (FAO & WFP, 2018).

According to Ministry of Agriculture statistics, the area of cultivated lands during this period decreased from 4.6 million hectares in 2011 to 4 million hectares in 2016. Fallow areas increased from 1.2 million hectares in 2011 to 1.7 million

hectares in 2016, of which 395 thousand hectares were irrigated and 698 thousand hectares were rainfed due to:

- The lack of security or the presence of military actions in the study area, the presence of debris of war in agricultural land (mines, etc.), the destruction of the structure of agricultural land as a result of the passage of military machinery, or the salinization of some lands to as a result of the destruction of irrigation channels and intentionally or voluntarily flooding of land, to prevent reinvestment without reclamation.
- The migration of farmers from their places of origin to safer areas or to urban areas.
- Loss of farmer's means of production, agricultural equipment and well-pumps, as they were stolen or destroyed
- The difficulty of securing production requirements due to their scarcity, high prices and monopolization (fertilizers, seeds, fuels, pesticides) and lack of financial resources for farmers to purchase them.
- Lack of agricultural labor force in rural areas to implement agricultural work and services.

The continued investment in land acquisition does not mean the lands were cultivated by farmers who own them, as there are large areas held as investment by influential people or seized by persons controlling the land without legal title (Katana, 2017).

It should be noted that the quantity and quality of weapons used in the conflict poses a serious environmental threat to arable land, as toxic substances have caused soil contamination, which adversely affects the quality of agricultural land and its cultivability or productivity. Although there is no evidence to measure the impact of soil poisoning, which is an important issue for the future research agenda, thousands of photographs, videos and testimonies documented the subjection of agriculture to various types of weapons. In addition, the 2014 Population Survey monitored the spread of oil refining activities in the eastern region, which resulted in significant contamination of agricultural land and local water sources.

3.3.1.2 Water Resources

Water resources in Syria consist of rainwater, per-

According to the Ministry of Water Resources, out of 4.6 million, 1.6 million hectares can be irrigated. It is estimated that less than 500,000 hectares were irrigated during 2017 and 2018, of which 300 thousand were irrigated from public networks

Thousands of photographs, videos and testimonies documented the subjection of agriculture to various types of weapons. In addition, the 2014 Population Survey monitored the spread of oil refining activities in the eastern region, which resulted in significant contamination of agricultural land and local water sources

Official statistics show the large increase in unlicensed wells between 2000 and 2010, where the number of wells doubled from about 64 thousand in 2000 to about 131 thousand in 2010

Figure 13 shows the sharp decline in irrigated areas during the conflict in spite of an increase in unlicensed wells after 2013

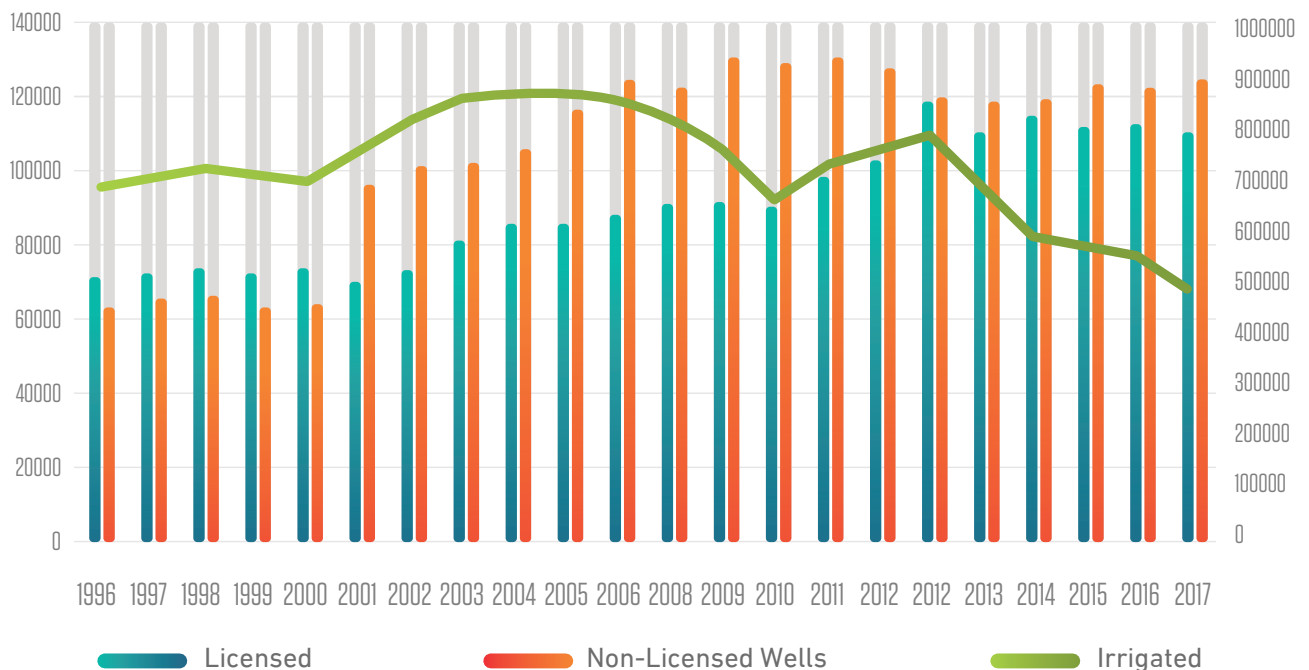
manent rivers, temporary runoff, springs and wells. The average of surface and groundwater renewable water, as well as Syria's incoming share of Euphrates, is estimated at about 16 billion cubic meters per year. In contrast, water needs are much higher than this. The agricultural sector invests 85-88 per cent of available surface and groundwater resources. The Ministry of Water Resources sets the water budget annually and determines the assigned amounts for each sector (Katana, 2017).

The water crisis is due to scarcity, drought, limited precipitation and irregularity, as well as misuse and control of the aquifer (Mike Westlake, 2001), as well as groundwater depletion due to the drilling of wells and the use of conventional, uncontrolled irrigation methods (Najafi 2010). Although the modern irrigation law was passed in 2000 and the modern irrigation project was adopted in the tenth five-year plan, it did not succeed. Official statistics show the large increase in unlicensed wells between 2000 and 2010, where the number of wells doubled from about 64 thousand in 2000 to about 131 thousand in 2010. Paradoxically, the increase in the number of unlicensed wells is accompanied

by the decline of irrigated areas between 2005 and 2010 as shown in Figure 13.

The conflict has destroyed many parts of Syria's infrastructure, including water infrastructure. The drinking water network has been heavily damaged, looted and vandalized, as have Syria's major water resources like the Tabaqa dam and purification plants in hotspots severely impairing the ability to provide water for the population. Water projects such as the Tigris irrigation project, targeting 200,000 hectares, and the Halbieh and Zalbieh irrigation project, meant for 26,000 hectares, have also been suspended. Drinking water institutions have faced difficulties in securing disinfectants, leading to the spread of diseases. On the other hand, the ongoing power outages impacted the operation of many wells that provide the cities and towns of Syria with water. Many water sources were contaminated, such as water bodies or groundwater, especially in oil-rich areas, where there is production and refining of oil in primitive ways, as well as frequent bombing (Shawqi, 2016).

Figure 13: Areas irrigated by wells and numbers of licensed and unlicensed wells 1996-2017



Source: Syrian Agricultural Group, Ministry of Agriculture

Figure 14 shows the sharp decline in irrigated areas during the conflict in spite of an increase in unlicensed wells after 2013. These statistics do not include unlicensed wells in many areas due to lack of access and control, where surface and ground-water encroachment has multiplied. In 2018, unauthorized drilling of artesian wells continued in Al-Hasakah, Daraa, Homs and Hama, but less wells were drilled in 2018 due to high drilling costs and fuel prices (FAO & WFP, 2018).

3.3.2 Contribution of agriculture to the Syrian economy during the conflict

The agriculture sector is one of the main components of the economy in Syria. Its importance has increased during the conflict due to its role in providing food security and maintaining the minimum living conditions for many of Syrian households that participate directly or indirectly in agricultural activities.

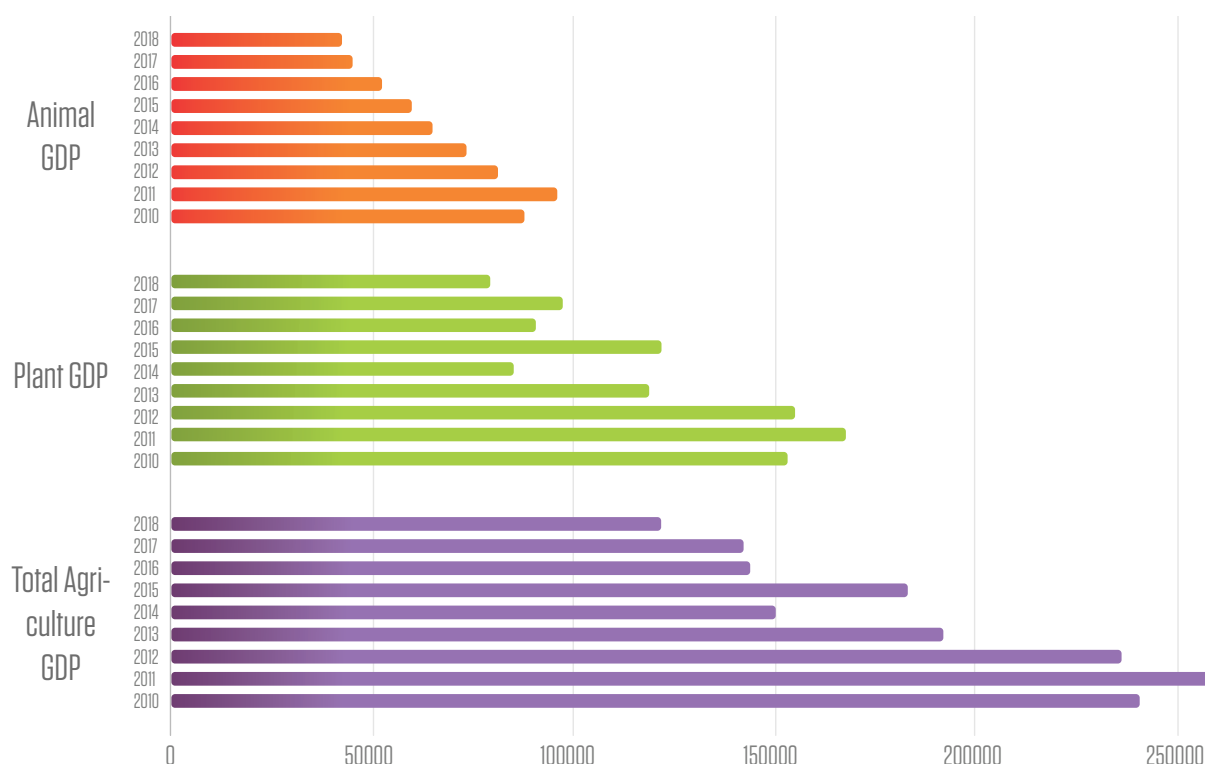
However, the sector witnessed dramatic deterioration as the armed conflict continued to affect agricultural production adversely through the

destruction of irrigation systems and the looting of its means, the difficulty of access to land in many areas, the lack of production requirements, especially fertilizers, seeds and fuel, the difficulty of transportation of products to markets, and the lack of necessary manpower.

Estimated from quantities of production, the agricultural GDP in Syria decreased by about 50 per cent, compared with 2010, and both plant and animal products declined by 49 per cent and 51 per cent, respectively. Agricultural production improved in 2011 due to the good rainy season and the absence of military operations. Subsequent years saw a steady decline in the agricultural sector, except in 2015, when Syria witnessed good climatic conditions that permitted an increase in the productivity of agricultural land. It is estimated that the gross domestic product of the agricultural sector in 2015 achieved a positive annual growth for the first time since 2011, increased by 7.5 per cent compared to the sector's output in 2014. This growth is entirely due to the improvement of plant production, while animal production declined during 2015 (SCPR, 2016). The decline in agri-

Estimated from quantities of production, the agricultural GDP in Syria decreased by about 50 per cent, compared with 2010, and both plant and animal products declined by 49 per cent and 51 per cent, respectively

Figure 14: Agricultural, plant and animal GDP at constant prices, 2010-2018



Source: Agricultural Group, Central Bureau of Statistics - Syrian Center for Policy Research

Wheat production decreased from 3083 thousand tons in 2010 to 2024 thousand tons in 2014; it improved in 2015, but deteriorated sharply to reach about 1227 thousand tons in 2018

cultural production continued during 2016-2017. Although the military operations declined in 2018, the sector witnessed deterioration in agricultural production, especially in rain-fed irrigated crops, due to adverse climatic conditions.

Despite the decline in agricultural production, its fall was less than that of the sectors, increasing its relative importance in GDP; the sector contributed 17 per cent in 2010 to the country GDP and about 31 per cent in 2017. The sector formed a network of protection for many Syrians to secure food and a minimum income.

3.3.2.1 Plant production

The plant products grown in Syria are divided into six main groups: cereals, legumes, vegetables, industrial crops, fruits and other crops. These crops are cultivated according to the agricultural cycles specified in the agricultural production plan. According to the Agricultural Statistics Abstract, the cultivated area of these products decreased in 2018 by 13 per cent compared to the cultivated areas in 2010. The strategic crops (wheat, barley, cotton and beets) occupy 68 per cent of the cultivated area. Wheat is produced to ensure the needs of the population for food, barley to provide the needs of livestock from feed, cotton and beets to cover the needs of the industrial sector for agricultural raw materials. The remaining 25 crops occupy 32 per cent of the area and produce 31 per cent of agricultural product, their expansion depends on the availability of water resources and market demands for consumption, food processing or export.

Agricultural production has been severely affected by the escalation of the conflict, the spread of hostilities in most agricultural governorates, the lack of safety and difficulty of access for farmers to their lands, and the destruction of agricultural infrastructure, resulting in poor production and difficulties in marketing, even when farmers have been able to harvest crops. Agricultural production also suffered from the lack of required inputs or an inability to obtain them and monopolization and high prices on the part of suppliers. The government has also raised the prices of fertilizers and diesel and stopped agricultural lending from the Agricultural Bank, as will be presented in the report later.

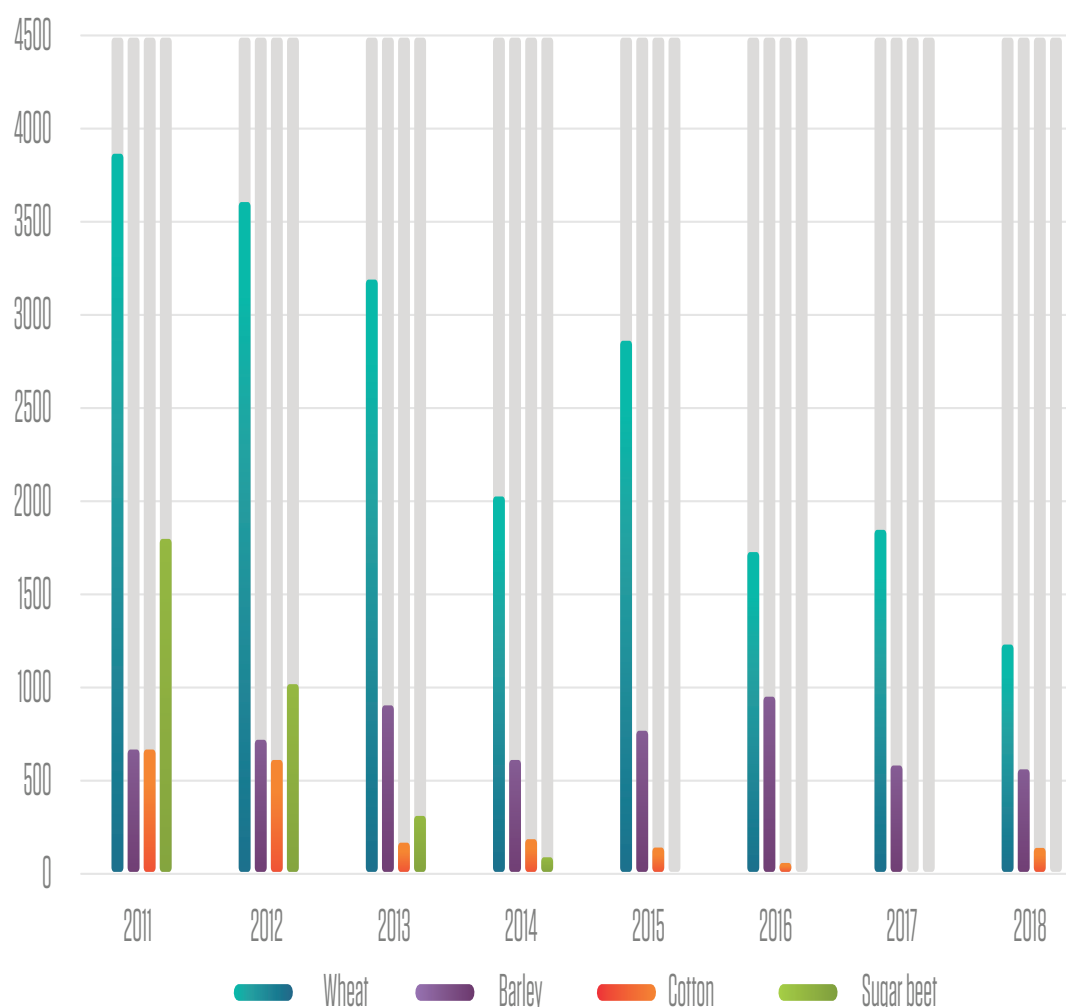
Wheat: Figure 15 shows that wheat production de-

creased from 3083 thousand tons in 2010 to 2024 thousand tons in 2014; it improved in 2015, but deteriorated sharply to reach about 1227 thousand tons in 2018, a decline of 61 per cent compared to 2010. 2018 shows the lack of rain, as well as existing conflict conditions, having a severe impact on wheat production. This is the lowest production of wheat since 1989, when Syria suffered from a severe food crisis as a result of a succession of droughts (Development and Environment, 2014).

The quantities marketed to the Grain Corporation during the conflict have also declined due to the government's partial retreat from its subsidy programs for this strategic crop. In terms of the decline in agricultural lending, restricted access to fertilizers (where only 10 per cent of the plan's needs have been provided in recent years and sold to members of agricultural associations, not individuals) and the provision of improved and high productivity seeds sufficient for only 8 per cent of the planned area (Katana, 2017). The state has lost its control over the marketization of wheat through the Grain Corporation despite the encouraging prices it has offered to farmers. Private grain marketization institutions have been set up outside government control, and farmers have engaged in informal selling. In addition, farmers retain a portion of the wheat produced for domestic consumption and to cover seed requirement for next year. A portion of the wheat crop is sold to the private sector so as to minimize costs of loading, unloading, transport and security risks (Katana, 2017).

Figure 15 shows that most of the crops from cereal products declined significantly during the conflict with production of grain falling only after hostilities began in 2012. As discussed, the pattern also reflects rainfall and climate factors.

Barley: Barley is an important strategic commodity as the first domestic source of animal feed. Its production costs are lower than those of other crops (Sharif, 2008). Barley cultivation is concentrated in Syria in the second, third and fourth settlement areas (where the land in Syria divided to different areas according to the rainfall rates) in the governorates of Ar-Raqqa, Al-Hasaka, Aleppo, Hama, Homs, Deir el-Zour, Idleb and Daraa. From Figure 15 appears that barley production remained around the level before the conflict until 2017, even in hot spots. Barley can withstand winter coldness up to -15 for a short period under Mediterranean

Figure 15: Quantities of agricultural production (strategic crops) for the period 2011-2018

Cotton and sugar beet were the main victims of the conflict, as their cultivation requires heavy irrigation and special care

Source: Agricultural Statistics Group - Syrian Center for Policy Research projections

conditions and can tolerate high temperatures and drought. The production of barley in 2018 was about 538 thousand tons compared to 680 thousand tons in 2010.

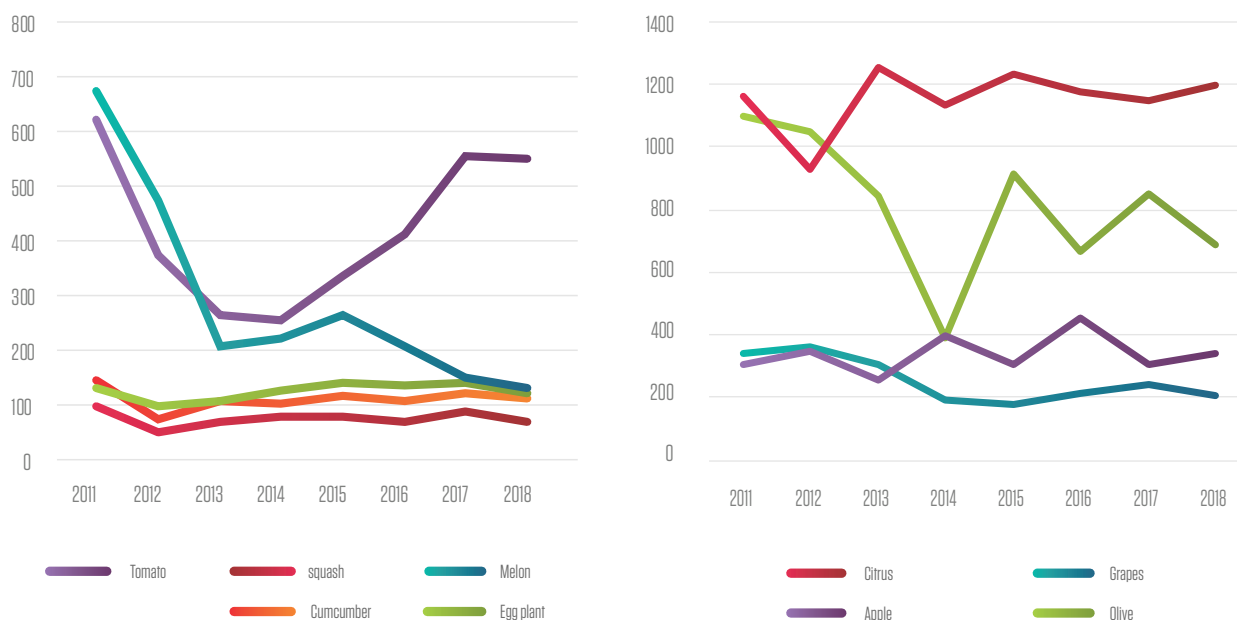
Cotton and sugar beet: The two crops were the main victims of the conflict, as their cultivation requires heavy irrigation and special care. Cotton production fell from 672,000 tons in 2011 to 124,000 tons in 2018. Sugar beet production fell from 1473 thousand tons in 2010 to only 5 thousand tons in 2018. Cotton is one of the pillars of the Syrian industry, where textile industries depend on the production of local cotton, and beets are the raw material for sugar factories.

Fruits and vegetables: Figure 16 reveal the decline in the production of most vegetables during the conflict, especially in 2013 and 2014. Some vegetables, such as tomatoes, cucumbers and eggplants, were relatively better in the period 2015-2018, but other crops such as melons and potatoes continued to decline during the conflict. As for citrus, the production of irrigated citrus is particularly concentrated in the governorates of Lattakia and Tartous, which have not been subjected to military operations or blockade. Citrus in particular maintained its level of production during the conflict.

Olive production declined gradually because of the lack of organic manure, the spread of disease exacerbated by the lack of required treatments, and

There was a decline in the production of most vegetables during the conflict, especially in 2013 and 2014. Some vegetables, were relatively better in the period 2015-2018

Figure 16: Quantities of agricultural plant production (fruits and vegetables) for the period 2011-2018



Source: Syrian Center for Policy Research projections

the continuation of combat operations in farming areas, where many of the farmers were forced to leave their land or not be able to discharge their production. Olive oil production also declined due to closure of many of the presses and bottling plants (Mohammad, 2017).

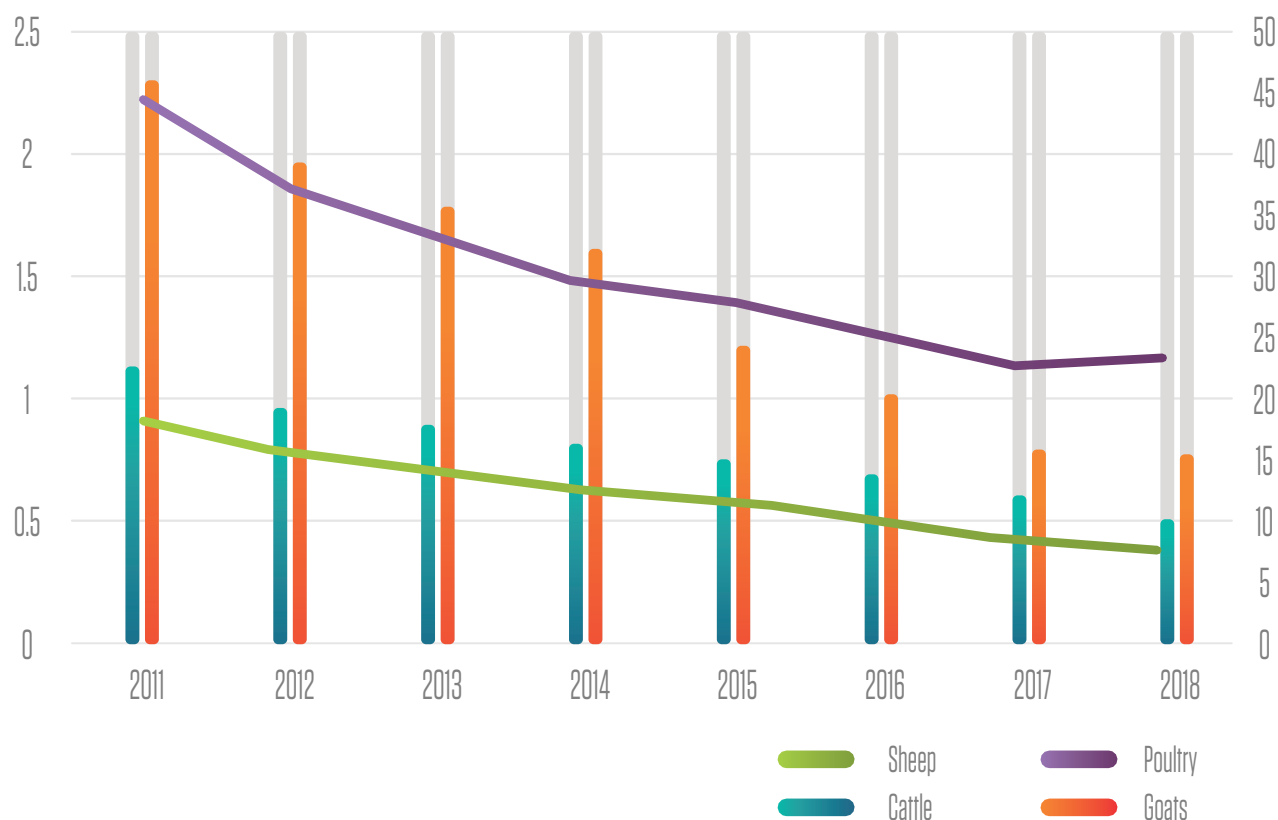
3.3.2.2 Animal Production

The pre-conflict drought of 2007-2009 decimated entire herds through thirst and hunger. During the conflict, the flocks of livestock decreased significantly due to the killing of animals during the hostilities, smuggling of sheep, cattle and goats to the neighboring countries and slaughter of many animals because of the inability to provide fodders, which amounts to about 70 per cent of the cost of animal production. The total needs of the Syrian livestock are from 14 to 17 million tons of fodders annually, 60 per cent of which is usually supplied locally. The cost of animal husbandry has increased as a result of the need to move continuously in search of pasture or to escape the conflict and the poor security conditions in the pastoral areas and zones of livestock is raised such as Deir el-Zour, Ar-Raqqa, Al-Hasaka, Daraa, rural Hama and rural Homs (Katana, 2017; Muhammad, 2016).

Figure (17) shows the decline in the number of animals from poultry, cattle, goats and sheep during the conflict. Heads of sheep have declined from 18 million in 2011 to 8 million in 2018. Those losses as well as those for other livestock and poultry represent a huge loss of wealth grown and accumulated over decades. Consequently, the quantity of animal products, such as meat, milk and eggs, which form a major part of food security, has been reduced as has their contribution to many food-processing domestic industries.

3.3.3 Agricultural production requirements

Agriculture in Syria has suffered from scarcity of production inputs and high costs. The conflict contributed to the decline in the production of energy, fodder, seeds and fertilizers, as well as imported inputs. The lack of security under military operations, the spread of looting, theft and sabotage, the liberalization of energy and key material prices, withdrawal of price supports and currency depreciation led to huge increases in the costs of production for farmers and, in turn to the quantity and quality of production. The state of energy, fertilizers and feed is discussed below.

Figure 17: Number of animals in millions

Source: Syrian Center for Policy Research projections

3.3.3.1 Energy

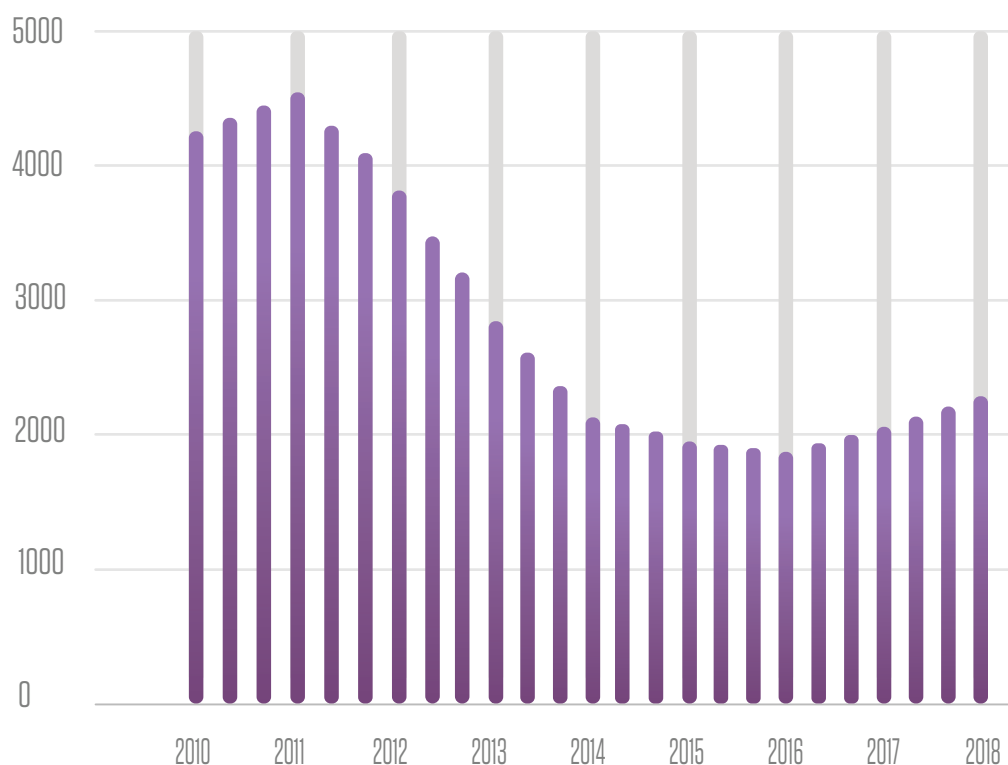
The 1990s witnessed a remarkable development in electric power, as generation, transformation and transmission and distribution networks were established. The capacity of power generation plants tripled from 1990 to 2011. Electricity production in Syria is overseen by the General Organization for Electricity Generation and Transmission as producer of 85 per cent of the total installed capacity, the General Establishment for the Euphrates dam in Ar-Raqqa of 10 per cent, the Ministry of Oil and Mineral Resources contributes 5 per cent distributed between 2 per cent in Homs and Baniyas, and the Directorate of Swedeah Oil fields in Rmailan 3 per cent.

The conflict led to 34 out of 54 electricity generating stations suspending service following armed confrontations, economic sanctions on this strategic industry, loss of control over oil and gas

wells and some thermal power stations, and finally sabotage and looting. Gas and power cuts were used as a form of combat pressure by all parties in the conflict (Mohammad, 2016).

Production of electricity declined by about 59 per cent in 2016 compared to 2010 and began to improve slightly to reach about half of the 2010 output (Figure 18). This was accompanied by a decrease in the availability of locally produced and imported petroleum products, affecting the productive economy in general and the agricultural sector in particular, which depends on electricity and oil derivatives in irrigation, agriculture and transportation. This has also impacted livestock farming raising, commercial especially poultry raising. The scarcity of energy sources corresponds a large increase in prices of electricity, diesel and fuel. For example, the official price of a diesel liter rose from 15 Syrian pounds to 180 Syrian pounds (2018) at the official price and parallel market price.

Heads of sheep have declined from 18 million in 2011 to 8 million in 2018. Those losses as well as those for other livestock and poultry represent a huge loss of wealth grown and accumulated over decades

Figure 18: Electricity production during 2010-2018

Source: Central Bureau of Statistics - Syrian Center for Policy Research projections

es in some areas have reached 300 Syrian pounds.

fertilizer consumption in 2017 is about 15 per cent of fertilizer consumption in 2011.

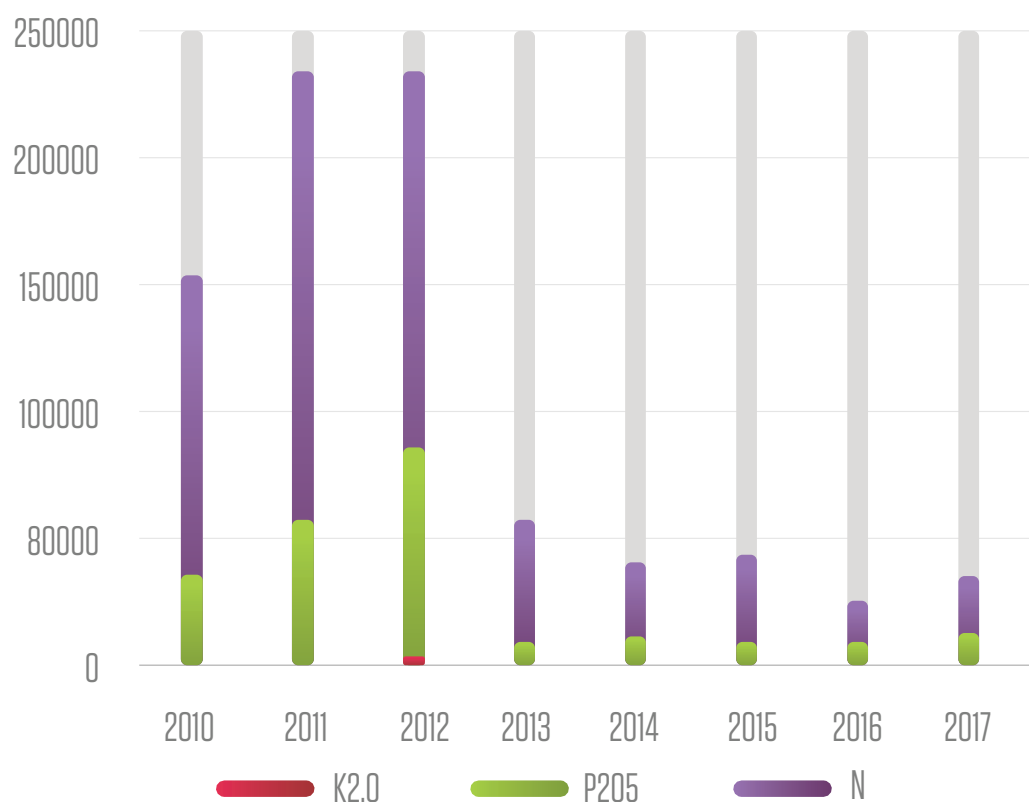
3.3.3.2 Fertilizers

Official prices of nitrogen fertilizer have risen significantly to 175,000 SYP per ton in 2018, an increase of 260 per cent over 2010, while the price of phosphorus fertilizer has increased by 200 per cent over 2010, and the price of potash fertilizer in 2018 to 412 thousand Syrian pounds per ton, an increase of 790 per cent over 2010.

The increase in fertilizer prices imported by the private sector is much greater. Private sector companies import compound fertilizers for the agricultural market, and their prices rose in line with the rise in the dollar against the Syrian pound. The price of a kilogram of balanced compound fertilizers increased from 70 SP in 2010 To 700 SP in 2014 and to 1000 SP in 2016 (Katana, 2017).

Figure 19 shows the increase in the quantities of fertilizers consumed in agriculture in 2011 and 2012 and their subsequent sharp decline. The total

Production of electricity declined by about 59 per cent in 2016 compared to 2010

Figure 19: Quantities of fertilizers consumed in agriculture 2010-2017

Source: Agricultural Statistics Group in 2017

The rise in fertilizer prices engendered a significant decline in production and a reduction in imports by two-thirds (Figure 20).

Security conditions, movement restrictions and price hikes constrained access to fertilizers for farmers. The reduced the use of fertilizers particularly impacted irrigated crops.

3.3.3.3 Fodder

The private sector imports fodders on the basis of the rules established by the General Establishment for Fodders. The annual consumption of livestock is estimated at between 14 and 17 million tons of fodder, 60 per cent of which is supplied locally from feed products, crop residues and harvest residues. The deficit is covered by importing 2.8 to 4 million tons per year (Katana, 2017). During the conflict, the value of locally produced and distributed fodder decreased. Actual needs for 2018 are estimated at 5.5 million tons of fodder and only

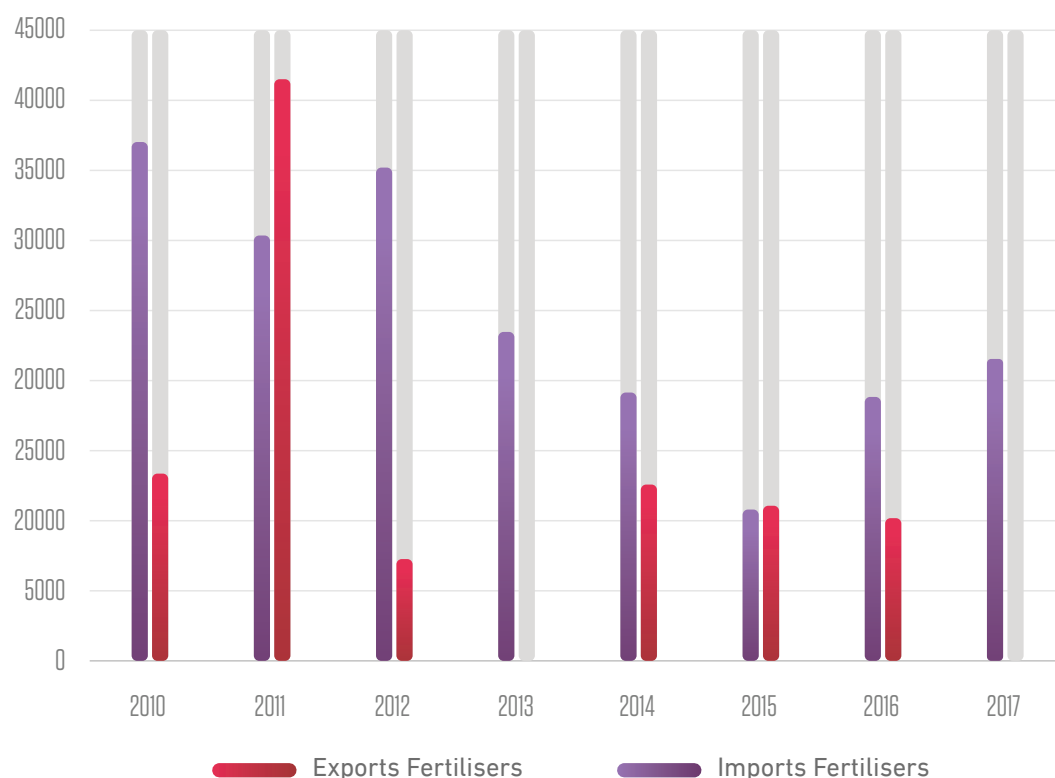
1.55 million tons are supplied through traders and farmers.

3.3.4 Total and agricultural employment

The population of Syria in 2018 was estimated at 19.4 million by SCPR. The poor living conditions and military actions in the hotspot areas of the northern, eastern and southern regions, both major agricultural areas, have contributed to the increase in the number of refugees and during the conflict, massively impacting the labor force in agriculture.

Agriculture is one of the most important sectors that require labor. Cotton is one of the largest crops absorbing labor, which needs twice as much as what wheat needs. For example, tobacco and beet require a large number of labor (Mike Westlake, 2001).

The proportion of employee in agriculture ac-

Figure 20: Value of imports and exports of fertilizers in Syria for 2010-2016

Source: WITS 2018

counted for 14.4 per cent of the total employment in 2010. This percentage has declined from previous periods due to the drought conditions on the one hand and the economic policies that marginalized the productive sectors including agriculture in favor of expansion in service sectors.

During the conflict, total employment declined sharply, with the employment rate falling from 39 per cent in 2010 to 20.9 per cent in 2017, and the unemployment rate reaching 52.7 per cent in 2017. This represented a loss of 2.8 million jobs by the end of 2017 (SCPR, 2018).

In the agricultural sector, employment decreased from 724 thousand in 2010 to about 200 thousand in 2014 and then gradually increased in 2018 to reach about half the number of workers in the sector for 2010. The number of female workers in the sector declined by about 40 per cent in 2018 compared to 2010, and the percentage of women employed in the agricultural sector has remained at the total number of workers in the sector at 20 per

cent for the period 2010-2018.

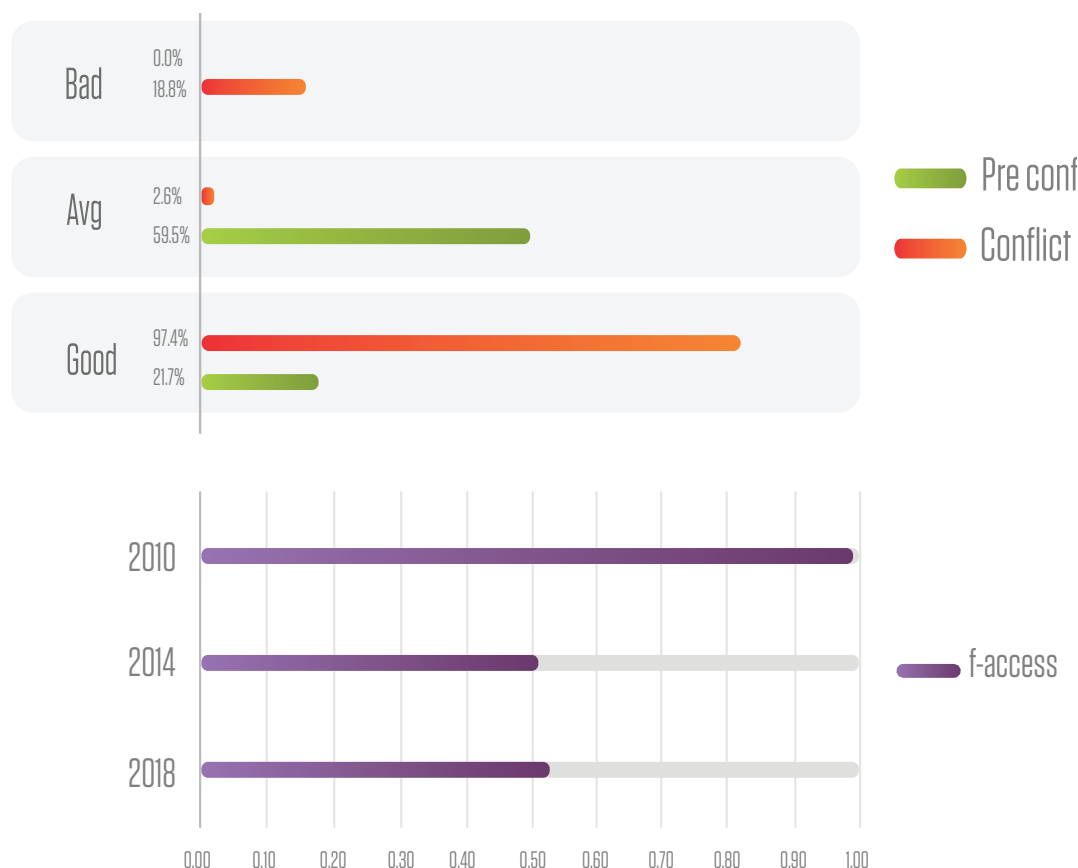
The purchasing power of wages has deteriorated as a result of high inflation rates, leading to higher poverty rates even for workers, where the prices doubled between 2010 and 2018 eight times and food prices increased more than other commodities (SCPR, 2019).

3.4 Access to food

The dimension of access to basic foodstuffs in the food security index was registered as the worst performing dimension, with only 21.7 per cent of the surveyed areas considering that most households were able to access basic foodstuffs during the conflict, compared with 97.4 per cent before.

Two-thirds of the areas studied responded that some households were partially able to obtain these materials, while estimations of households not able to obtain basic foodstuffs were 18.8 per cent of all households in the area.

In the agricultural sector, employment decreased from 724 thousand in 2010 to about 200 thousand in 2014 and then gradually increased in 2018 to reach about half the number of workers in the sector for 2010

Figure 21: Access to Basic food

Source: Population Status Survey - Syrian Center for Policy Research

These results varied widely among the governorates and regions in Syria.

The percentage of those who considered that most of the households were unable to obtain food-stuffs in the governorates of Ar-Raqqa, Quneitra, Al-Hasakah and Damascus countryside 79.8 per cent, 62 per cent, 50.6 per cent and 28.7 per cent respectively.

The results vary within the governorate: 38 per cent of the respondents from rural areas in Damascus confirmed that most of the families in their part of the Damascus countryside were able to get food due to the disparity in the security conditions, presence of siege, and the intensity of hostilities between different areas in the countryside of Damascus.

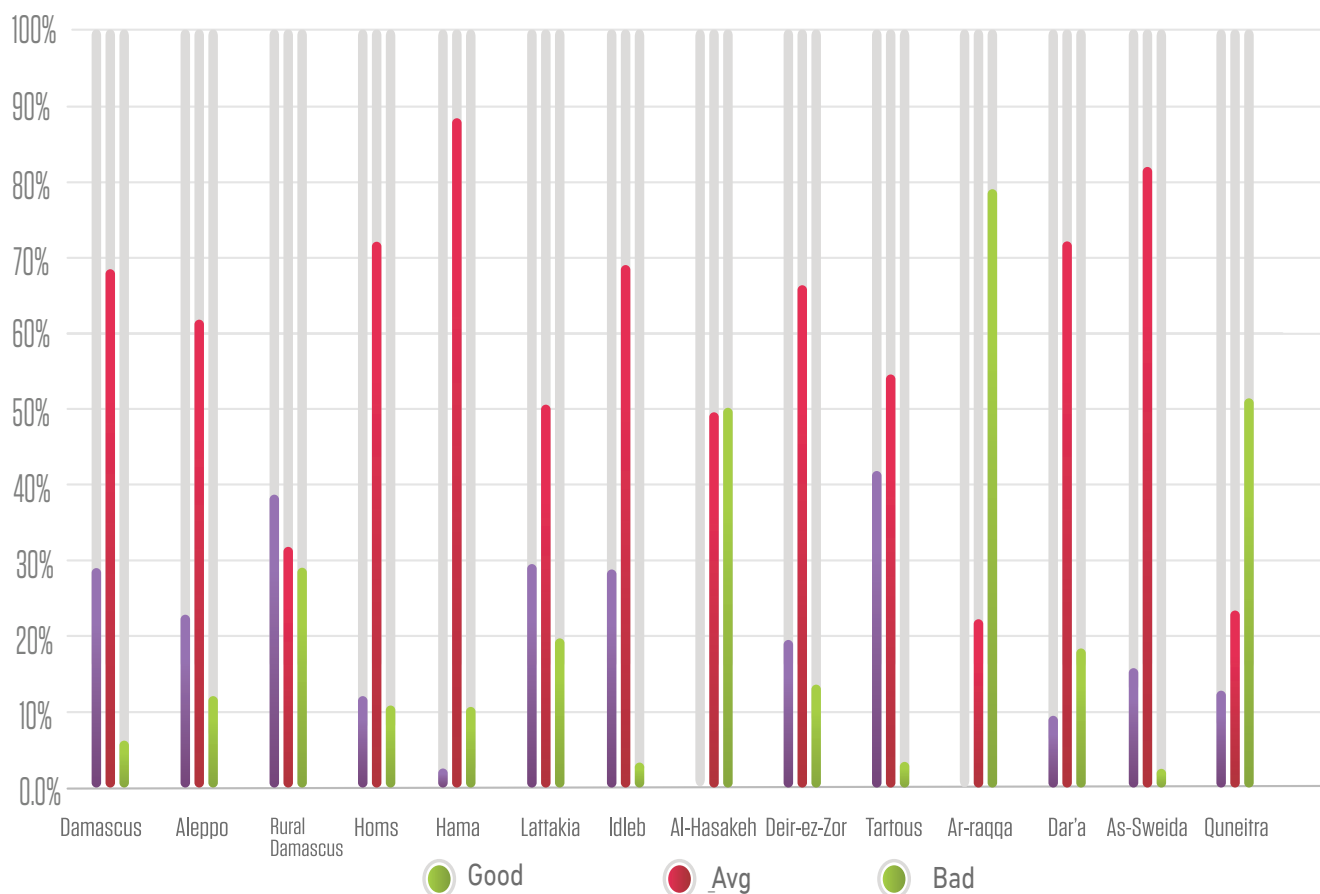
Those in areas such as the Dimas and the Qudsaya

district in the western areas of Damascus countryside, most families are able to obtain food, while areas such as Erbeen, Zamalek and Duma people endure great barriers with access to basic food-stuffs.

The survey period covers 2014 and the projections in the research indicate a slight improvement in 2018 as hostilities declined and the besieged areas shrunk, allowing more families to access food, but other factors such as poverty and lack of employment continued to deprive large segments of the population of food.

The access dimension relates to direct restrictions on food access as a blockade as well as restrictions on safe movement, but also to the demand side, that is the purchasing power of individuals. Below we discuss the determinants of demand based on available data and indicators.

The survey period covers 2014 and the projections in the research indicate a slight improvement in 2018 as hostilities declined and the besieged areas shrunk, allowing more families to access food, but other factors such as poverty and lack of employment continued to deprive large segments of the population of food

Figure 22: Access to basic food by individuals during the conflict at the governorate level

Source: Population Status Survey - Syrian Center for Policy Research

3.4.1 Demand factors

3.4.1.1 Population

The population was 19.4 million in 2018, with the population growth declining steadily as a result of the high mortality rate, especially among males. In addition, the birth rate declined sharply from 38.8 to 25 per thousand between 2010 and 2018 (SCPR, 2018). Waves of asylum abroad of some 5.3 million people (UNHCR, 2017), left 21 per cent of Syrians out of the country, reducing demand for food.

Residents living in Syrian territory suffered from harsh living conditions and a decline in economic capacity, especially in the besieged areas and areas of conflict, which witnessed massive destruction of infrastructure and serious security conditions. Studies have shown a significant change in the

distribution of the population between the governorates and the areas of IDP settlement in safer areas and cities. The population increased between 2014 and 2017 in Idleb and Damascus, while it decreased in Aleppo, Al-Hasakah and Ar-Raqqa (SCPR, 2018).

Conflict has played a major role in the food suffering of the population. A special report carried out in collaboration between FAO and WFP in 2018 shows that displacement is the main driver of food insecurity in the country, with 6.2 million displaced, of whom 1.3 million were displaced from January 2018 (many of which have been displaced more than once). The report also showed that the hard-to-reach population fell from 4.1 million in 2017 to 1.5 million. The number of people in besieged areas has dropped from more than 1 million people by the beginning of 2017 to zero by the end of 2018.

Overall prices rose eight times between 2010-2017. While the nominal monthly wages of wage earners reached 29,700 Syrian pounds in 2017, the real wage represents not more than 24 per cent of the real wage for 2010

3.4.1.2 Continued increase in living costs

Living costs continued to increase, at the same time income sources, wages and job opportunities decline.

Many families lost their breadwinners, forcing them to rely on subsidies that do not meet their daily needs. Based on statistical evidence and expert evaluations, the Syrian Center for Policy Research (SCPR) estimates that the consumer price index (CPI) has risen sharply, as the prices of some commodities rose more than ten times pre-conflict levels. Policies to reduce subsidies for basic commodities such as oil derivatives and electricity, as well as the drop in the value of the Syrian pound have contributed to significant surge in prices. That said, prices vary widely between the various Syrian regions, with, of course, the price being greatest in the besieged areas where monopolization on the one hand and difficulty of supply were the norm.

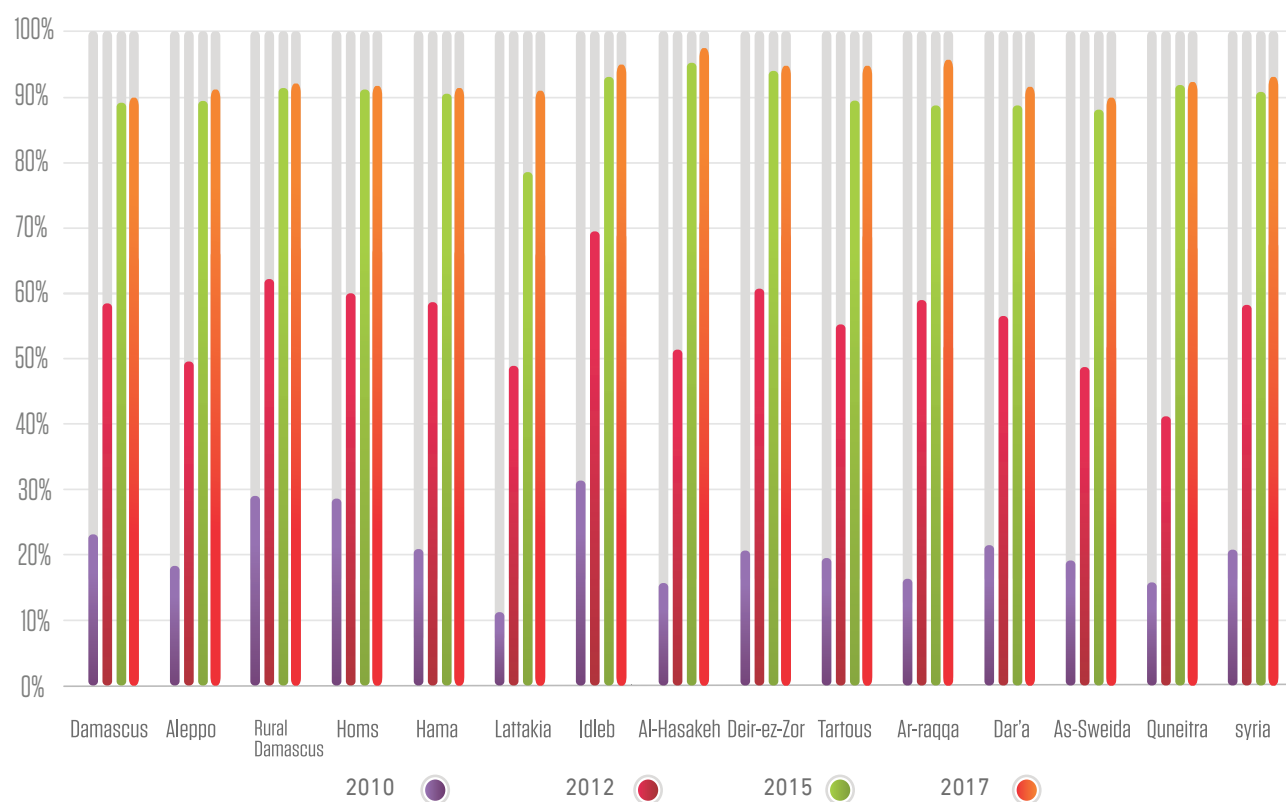
Overall prices rose eight times between 2010-2017. While the nominal monthly wages of wage earners reached 29,700 Syrian pounds in 2017, the real wage represents not more than 24 per cent of the real wage for 2010, according to the Syrian Center for Policy Research. This reflects the seriously degraded living conditions. The dependency rate of worker in 2017 reached 7.73 compared to 4.1 in 2010 (SCPR, 2019).

Poverty and deprivation rates reached a high level of 93.7 per cent by the end of 2017 based on the household line for poverty of an average of 181,000 Syrian Pounds per month, while extreme poverty reached 59.1 per cent in the same year.

This results from both the conditions of war and the policies associated with the violence economies. Figure 23 shows the general trend of total poverty by Syrian governorates, across recent years.

Poverty and deprivation rates reached a high level of 93.7 per cent by the end of 2017 based on the household line for poverty of an average of 181,000 Syrian Pounds per month, while extreme poverty reached 59.1 per cent in the same year

(Figure 23: Overall poverty prevalence in Syria by governorate (2010, 2012, 2015, 2017)



Source: SCPR estimates based on HIES 2009 - Central Bureau of Statistics

Some 2.5 million people have been victims of siege policies between 2015 until 2018

3.4.1.3 Sieges

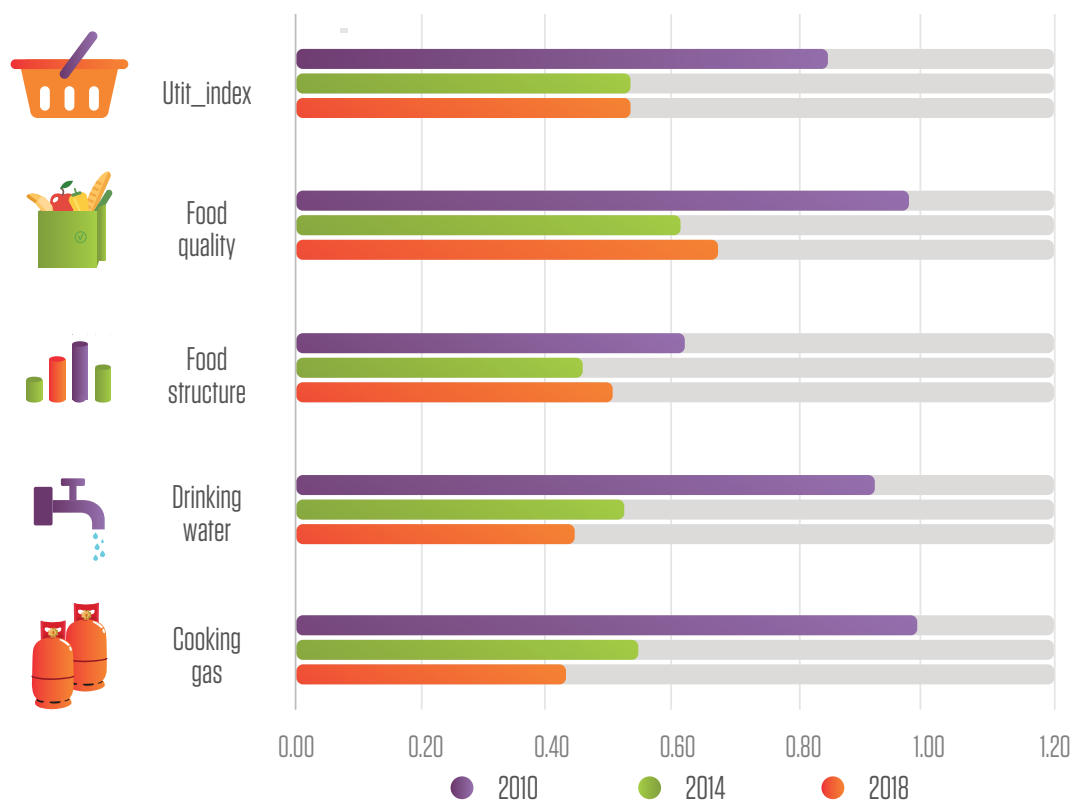
Siege strategies during war represent a serious violation, as society is starved through “collective punishment” until submission. Some 2.5 million people have been victims of siege policies between 2015 until 2018 (PAX, 2019), with a peak in 2017 when around 970,000 people were simultaneously under sieges (OCHA, 2018) in Ghouta, Deir el-Zour, Aleppo, Al-Rastan and other cities, neighborhoods and villages. Siege policies included denial of access to food and humanitarian assistance, restrictions on the movement of populations, and targeting of besieged areas with various types of weapons. Price differences could be few hundred times between the besieged and accessible areas. Besieged people suffered from hunger and lack of basic medical services. Many areas have also suffered from quasi-sieges, as they were partially blocked and faced shortages in to food and basic necessities of life. With sieges, violence economies flourished. The barriers between different spheres

of influence created opportunities for wealth through smuggling everything, from agricultural inputs, food, fuel to human beings. Dominant actors also exploited the local population by monopolizing materials, exploiting people’s needs and commanding production. Although siege conditions largely ceased by the end of 2018, the suffering of the people who have been under sieges has not yet ended, as the lack of food and health witnessed earlier has long-term effects, especially on children.

3.5 Utilization

Utilization is the third dimension of the Food Security Index and concerns the extent to which individuals benefit from the basic food available. It is composed of four sub-indicators: Food quality, food composition, drinking water and cooking fuel. The dimension declined about 37 per cent between 2010 and 2014 and maintained almost the same level in 2018 projections (Figure 24).

Figure 24: The utilization dimension in the Food Security Index and its sub-indices 2010-2014-2018



Source: Population Status Survey - Syrian Center for Policy Research projections

The deterioration in utilization reflects the decrease in the nutritional status of the population and accompanying increase in morbidity and an inability to perform vital functions. A dangerous effect is the stunting of children's physical and intellectual growth.

3.5.1 Quality of food

Results in 2014 showed of respondents in the areas studied 33,5 per cent considered the available food was of good quality, 55,7 per cent considered that it was medium quality, and 10,7 per cent considered that the existing materials were of poor quality; projections show a slight improvement in 2018.

These results indicate significantly reduced food quality compared to the pre-conflict period (Figure 25). According to respondents in the area studied, the reasons for the decline in quality were a lack of control over raw materials in the industry or the smuggled materials from the neighboring mar-

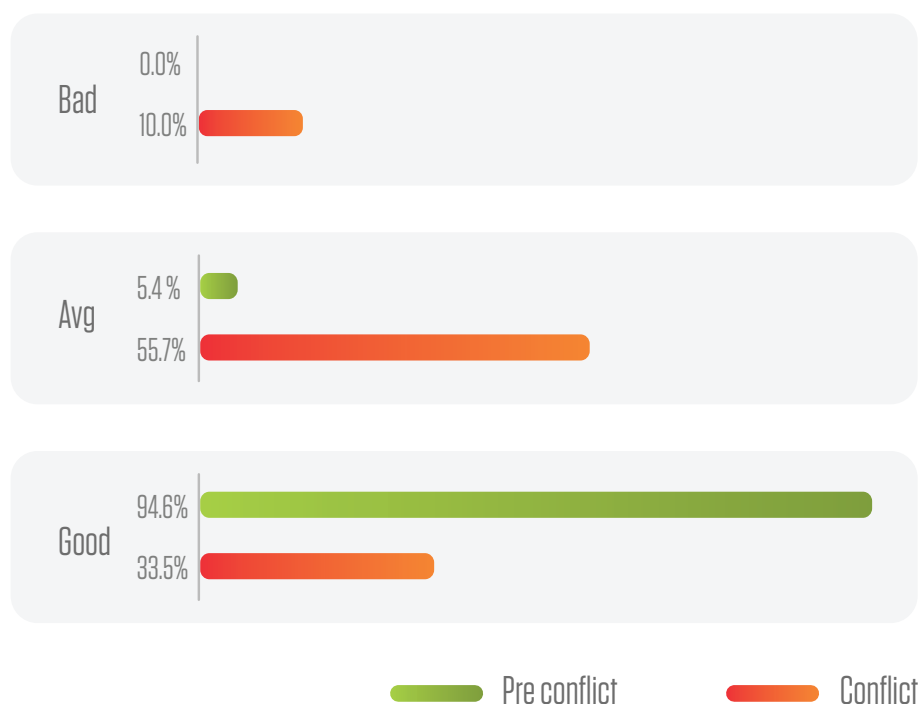
kets, the poor quality supplies, and the disparity between prices in good and poor product, often causing families to settle for low quality food, or even items not meant for human consumption.

Some attributed the poor quality of products to the monopoly and fraud practiced by sellers, especially in dairy products and cheeses. Furthermore, because of problems in transportation of food products (road blocking, long distance without proper preparation) and poor storage conditions because of intermittent electricity cuts products suffered spoilage.

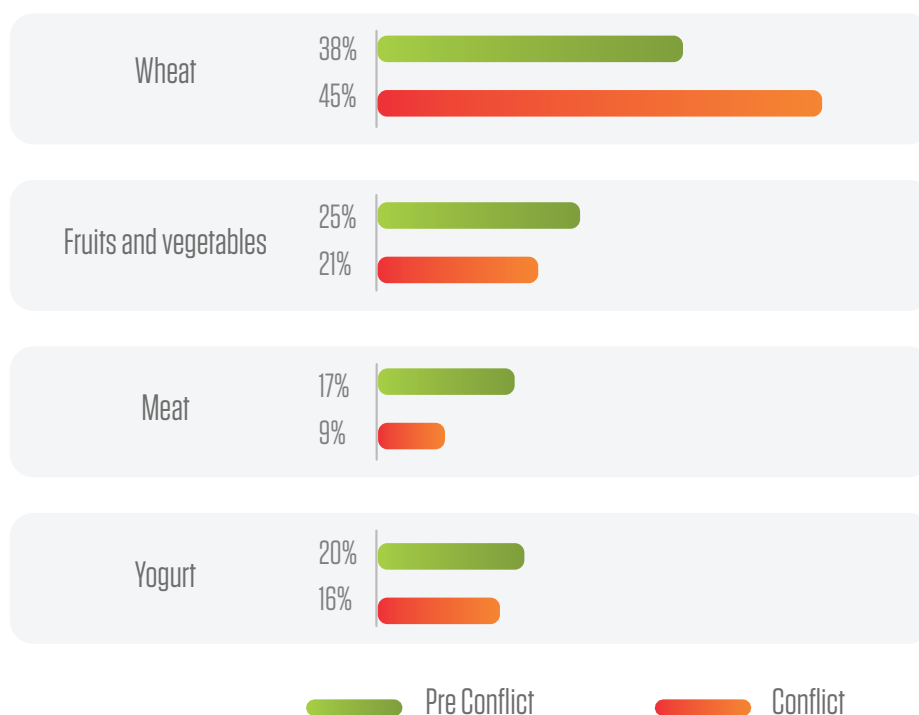
Results varied at the level of governorates and studied areas. The lowest quality products in the cities of Ar-Raqqa, Al-Hasakah, Aleppo, Deir el-Zour, Idleb and rural Damascus; most in areas that witnessed intense hostilities. The results showed that the quality of food remained relatively better in Lattakia, Tartous, Homs and Sweida governorates.

The deterioration in utilization reflects the decrease in the nutritional status of the population and accompanying increase in morbidity and an inability to perform vital functions. A dangerous effect is the stunting of children's physical and intellectual growth

Figure 25: Quality of food



Source: Population Status Survey Syrian Center for Policy Research projections

Figure 26: Relative composition of food consumption before and during conflict

Source: Population Status Survey Syrian Center for Policy Research projections

The obvious imbalance in food composition during the conflict, where bread come to make up 54 per cent of the relative composition of the food and vegetables only 21 per cent

3.5.2 Relative composition of food consumption

The relative composition of food consumption expresses the nutritional content of the food consumed by the individual. Nutritionists and specialists recommend that the daily diet should include a certain number of foods from five groups:

- Vegetables
- Fruits
- Bread, rice, pastries, wheat-based food
- Milk, yogurt and cheese
- Meat, poultry, fish, dry legumes, eggs and nuts.

For relatively good nutrition daily consumption should contain 40 per cent of bread and its derivatives, 13 per cent meat, 13 per cent milk and the like, and 34 per cent fruits and vegetables.

Figure 28 shows the obvious imbalance in food composition during the conflict, where bread come to make up 54 per cent of the relative composition

of the food and vegetables only 21 per cent.

Field studies of the nutritional status of children show inconsistencies in the results. A rapid nutrition survey targeting IDPs living in camps in 2014 in all governorates except Ar-Raqqa and Deir el-Zour (Ministry of Health, 2014) indicates a prevalence of stunting of children at 7.2 per cent.

In 2016, the Ministry of Health, with the support of UNICEF, conducted surveys in accessible areas in 11 governorates (Deir el-Zour, Idleb and Ar-Raqqa were not included, as well as the study did not include insecure areas of other governorates). This survey shows that the prevalence of global acute malnutrition (GAM) for children under five years of age in 11 governorates is only 3 per cent and severe acute malnutrition is 0.7 per cent based on weight on height (SMART, 2016). These findings do not indicate access to risk in the nutritional case of children. However, the discrepancy appears in studies covering areas beyond government control. In 2017, the SMART survey of areas not controlled by the government in Eastern Ghouta reported an

acute malnutrition rate of 11.9 per cent and a severe acute malnutrition rate of 1.6 per cent (PAC, 2017). The proportion of children under five years of age who suffer from acute malnutrition in the areas controlled by the opposition in Daraa governorate is 7.8 per cent of children (UNICEF, 2017).

As for the stunting of growth, its rates were much higher in areas outside government control. For example, the rate of stunting growth in Tal Abyad in Ar-Raqqa was 32.4 per cent (ACU, 2018). Similarly, the prevalence of stunting growth in Eastern Ghouta was 36 per cent (PAC, 2017) and 27.5 per cent in East Daraa (UNICEF, 2017) and 25.6 per cent in Aleppo.

The methodological challenges for nutritional surveys are the lack of a rigorous statistical framework due to high population mobility and inaccessibility, and a decline in the quality of survey implementation in the absence of the capacity to monitor the quality of implementation. The conflict has been a critical factor in bias in conducting and disseminating studies.

3.5.3 Availability of drinking water

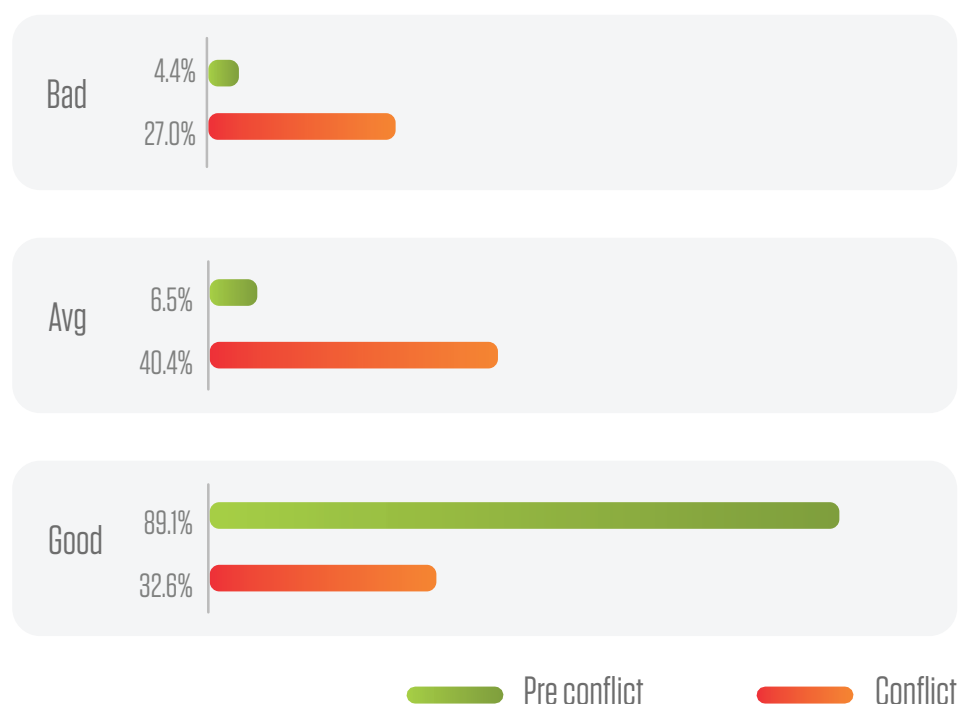
The Syrian population had difficulty in access improved drinking water since the beginning of the conflict, in addition to rising costs for water.

A recent study showed that Syrian households in some areas allocated 20-25 per cent of their income to water. Drinking water per capita declined to less than 600 m3 per capita per year during the conflict (Shawqi, 2016). Access to clean drinking water has become difficult even in safe areas. Access to clean drinking water decreased from 89.1 per cent prior to the conflict to 32.6 per cent during the conflict.

The survey found that 27 per cent of the households considered that the availability of drinking water was bad due to the lack of access to the water through the public network; the water they could find was not suitable for drinking and needed to be sterilized. People had come to rely on alternatives, notably water tanks (Figure 27).

Access to improved drinking water decreased from per cent prior 89.1 to the conflict to per cent 32.6 during the conflict. The survey found per cent of 27 that the households considered that the availability of drinking water was bad due to the lack of access to the water through the public network

Figure 27: Access to improved drinking water before and during conflict



Source: Population Status Survey Syrian Center for Policy Research projections

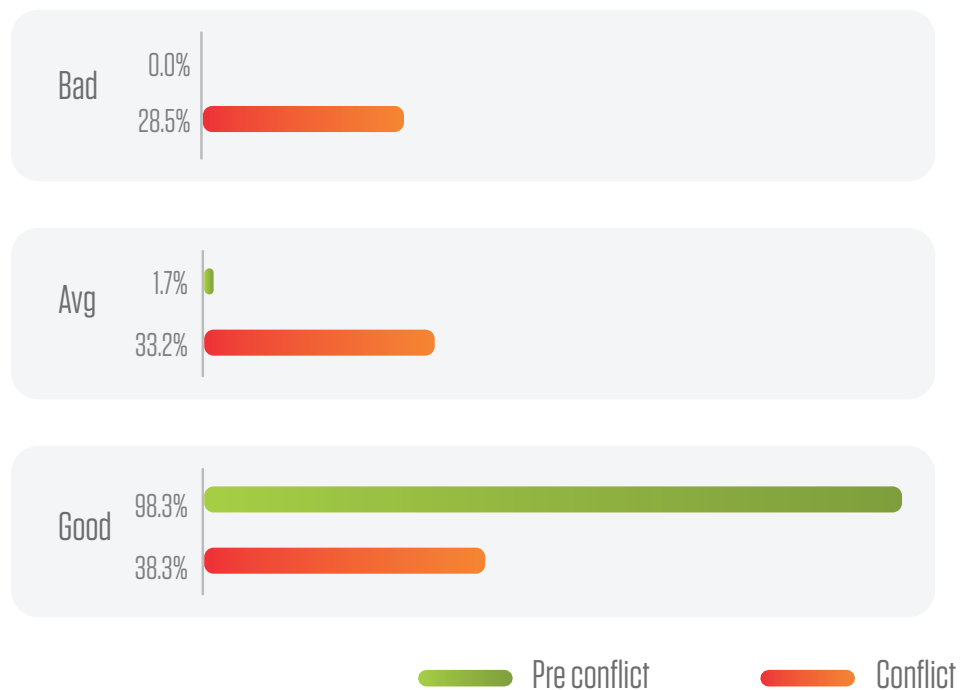
Cooking gas is essential today to provide healthy food. The index for availability of cooking gas fell from 98.3 per cent prior to the conflict to 38.3 per cent during the conflict

The reasons given for this are military operations that destroyed infrastructure, vandalism, looting, restrictions on movement, and most serious, the targeting and control of water resources as a form of collective punishment. Problems of water supply are compounded by rationing and power cuts as electricity is required to operate the pumps and insufficient water due to the increase in population following IDP resettlement in safe areas. The lack of improved water directly affects public health and leads to malnutrition and the spread of diseases.

3.5.4 Cooking gas

Cooking gas is essential today to provide healthy food. The index for availability of cooking gas fell from 98.3 per cent prior to the conflict to 38.3 per cent during the conflict, with besieged areas hit the hardest. Monopolization, difficulty of transportation, destruction of infrastructure, and the difficulty of importing contributed to the acute shortage of energy, including cooking gas in many areas (Figure 28).

Figure 28: Availability of cooking gas



Source: Population Status Survey Syrian Center for Policy Research projections

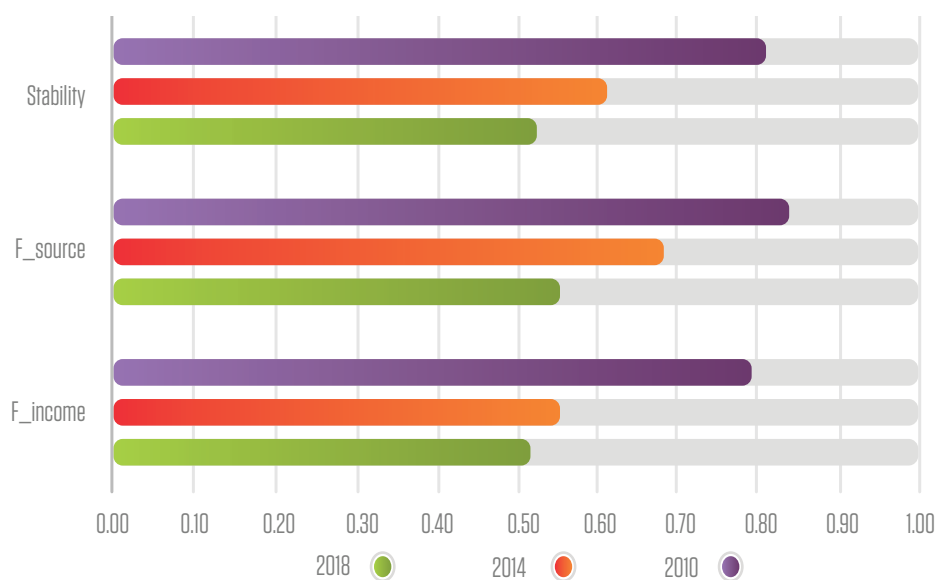
3.6 Stability and sustainability

The stability and sustainability dimension focuses on the availability of food in a reliable manner in terms of production, income and conservation of natural resources. The results in Figure 29 indicate a deterioration of the stability dimension by about 25 per cent between 2010 and 2014. The decline continued as projected in 2018 due to increased dependency on imports and aid, and the worsening of living conditions and individuals' income.

According to a study by FAO, by 2016, the stability

of food access and supply stability has declined comparing to the pre conflict level. More than 57 per cent of households in rural areas continue to grow food for their own consumption.

The proportion of income spent on food increased as incomes and household production dropped, while food prices rose sharply. Pre-conflict, 25 per cent of households spent more than half of their annual income on food, and now more than 90 per cent of households spend more than half of their annual income on food, indicating a sharp increase in poverty (FAO, 2017).

Figure 29: Stability component and its sub-indicators

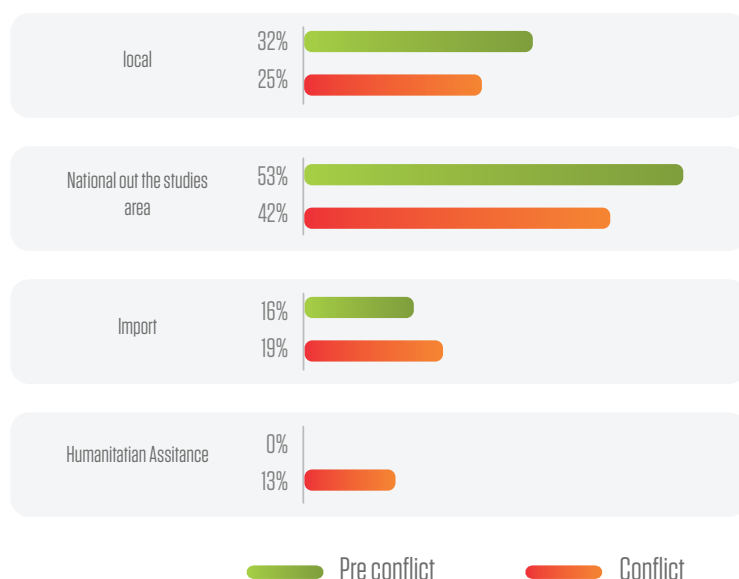
The results indicate a deterioration of the stability dimension by about 25 per cent between 2010 and 2014. The decline continued as projected in 2018 due to increased dependency on imports and aid, and the worsening of living conditions and individuals' income

Source: Population Status Survey Syrian Center for Policy Research projections

3.6.1 Food sources

Figure 30 shows the food sources index, which reflects the degree of stability of food supplies to Syrian households. The share of foodstuffs from local sources within or outside the study area within Syria, has declined. Relative dependence on humanitarian assistance and imports has increased

significantly, particularly in border areas. Many factors have contributed to the nature change in food sources, such as the availability of agricultural land and water, the intensity of fighting, proximity to the border, and sieges. For example, Douma under siege came to rely 100 per cent on local sources from the immediate area.

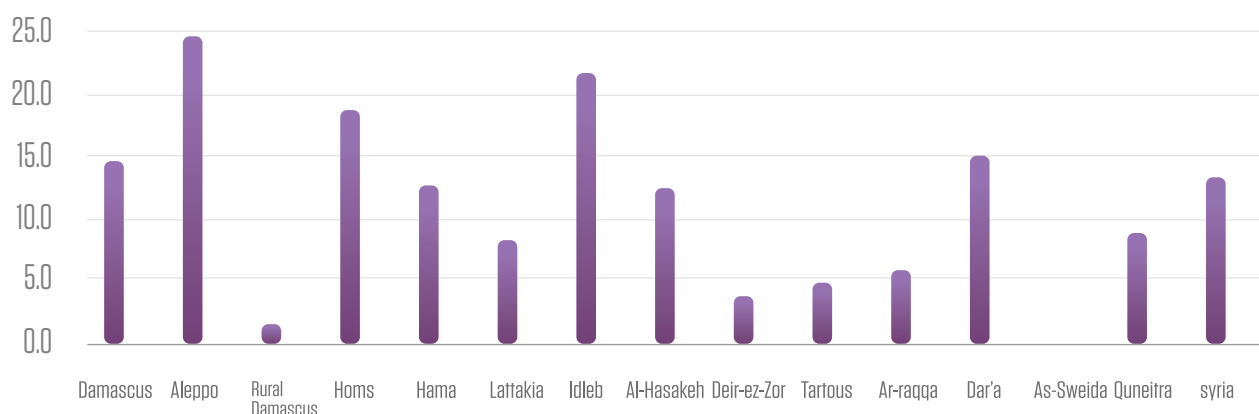
Figure 30: Main food sources index

Source: Population Status Survey Syrian Center for Policy Research projections

During the conflict the proportion of food from aid rose to 13 per cent nationally. Figure 31 shows that the largest portion of aids went to Aleppo, Idlib, Homs and Daraa, while the rural areas of Damas-

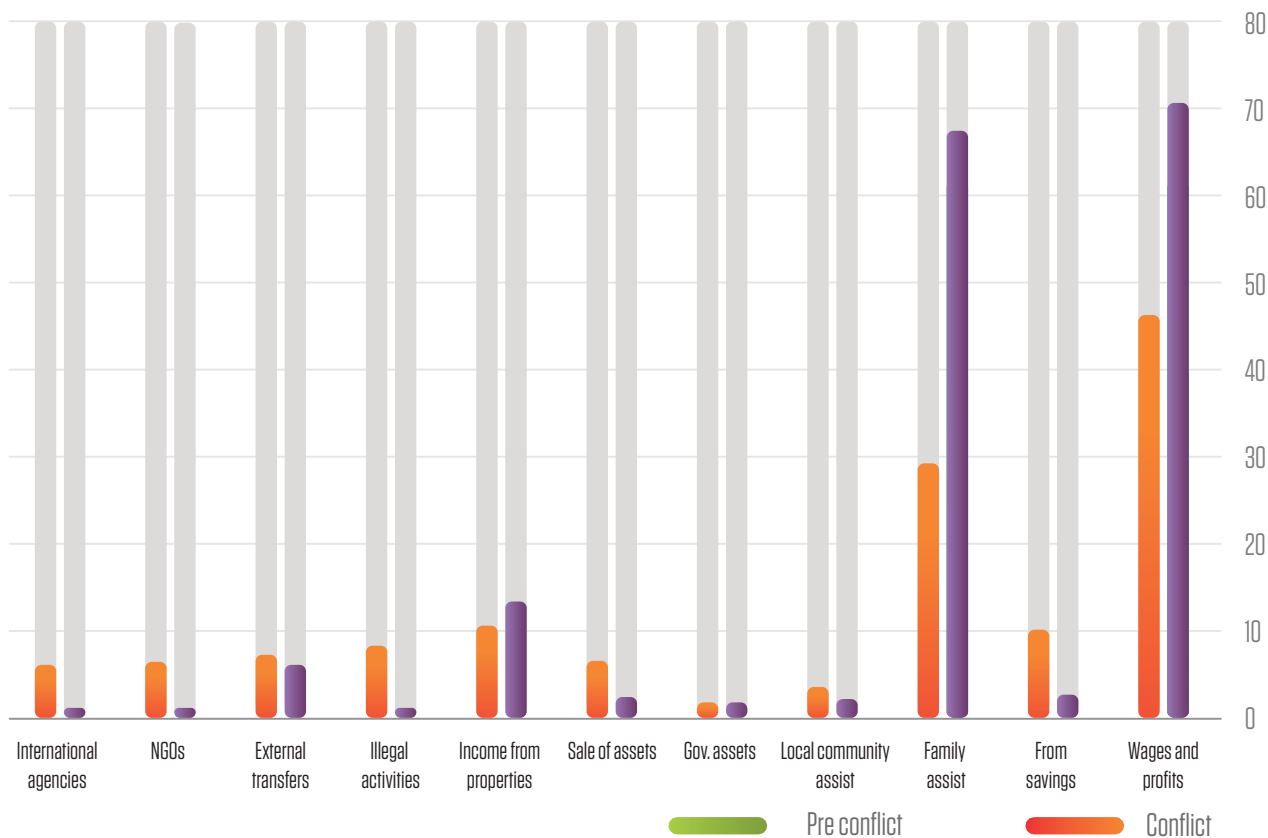
cus receive the lowest percentage, although they were among the worst affected during the conflict. This indicates the difficulty of reaching the needy areas.

Figure 31: Food items through humanitarian assistance by governorates during the conflict



Source: Population Status Survey Syrian Center for Policy Research projections

Figure 32: Relative distribution of sources of income before and during conflict



Source: Population Status Survey Syrian Center for Policy Research projections

3.6.2 Structure of household income sources

Work provided 47 per cent Syrian households' income sources during the conflict, although its contribution declined significantly from 2010 by about one-third. International organizations contribute only 6 per cent, comparable to the contribution of local NGOs.

Most international reports on the size of assistance in their performance assessment are based on the number of beneficiaries and not on the coverage of basic needs or the amount of support provided relative to the needs of the target population. UN organizations report that they cover the needs of four million people without indicating to what degree the assistance actually meets people's needs.

The results in Figure 32 show the increasing dependence of households on withdrawals from savings and the sale of property to meet the severe shortage of labor-related sources of income. We also note the increase in income associated with

illegal acts, which is evidence of the widening economies of violence used by authoritarian forces to harness human and material resources.

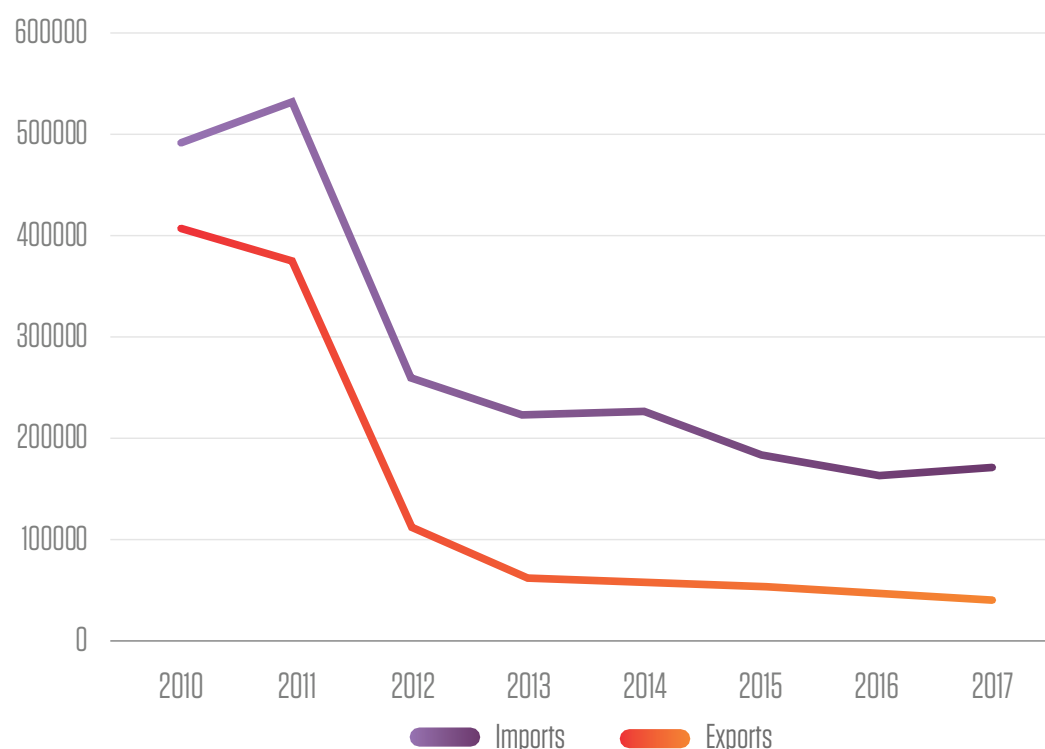
3.6.2.1 Import dependency

During the conflict, imports of food products from cereals, oil, rice, sugar and other agricultural and food products continued to cover the needs of the population. Traders bypassed the economic sanctions imposed on Syria through imports through intermediate companies.

This reflected negatively on the value of the goods, their standard specifications and quality. Trade of agricultural and food products between Syria and neighboring countries has also continued in irregular ways. Neighboring countries have been a major source of the population's need for agricultural and food products especially in border towns and cities. Figure 33 shows that imports during the conflict accounted for an average of 38 per cent as a percentage of GDP, accompanied by a sharp decline in exports.

Work provided 47 per cent Syrian households' income sources during the conflict, although its contribution declined significantly from 2010 by about one-third

Figure 33: Exports and imports as a share of GDP



The share of food products in total imports reached 40 per cent in 2013, which was the highest percentage of imports of foodstuffs for total imports and this share maintained at a high level during the following years

Source: Population Status Survey Syrian Center for Policy Research projections

Many agricultural policies and industrial activities, based on feasibility studies which neglected environmental factors, either at the planning or implementation stage, contributed fundamentally to environmental degradation and came to pose a threat to sustainable development

The share of food products in total imports reached 40 per cent in 2013, which was the highest percentage of imports of foodstuffs for total imports and this share maintained at a high level during the following years (Figure 34). The dependence on imports affects stability of access to food, negatively affects the balance of payments and leads to a deterioration in the value of the local currency, accompanied by higher prices. It also indicates the degree of food deficit and the deterioration of domestic production.

3.6.2.2 Environmental sustainability

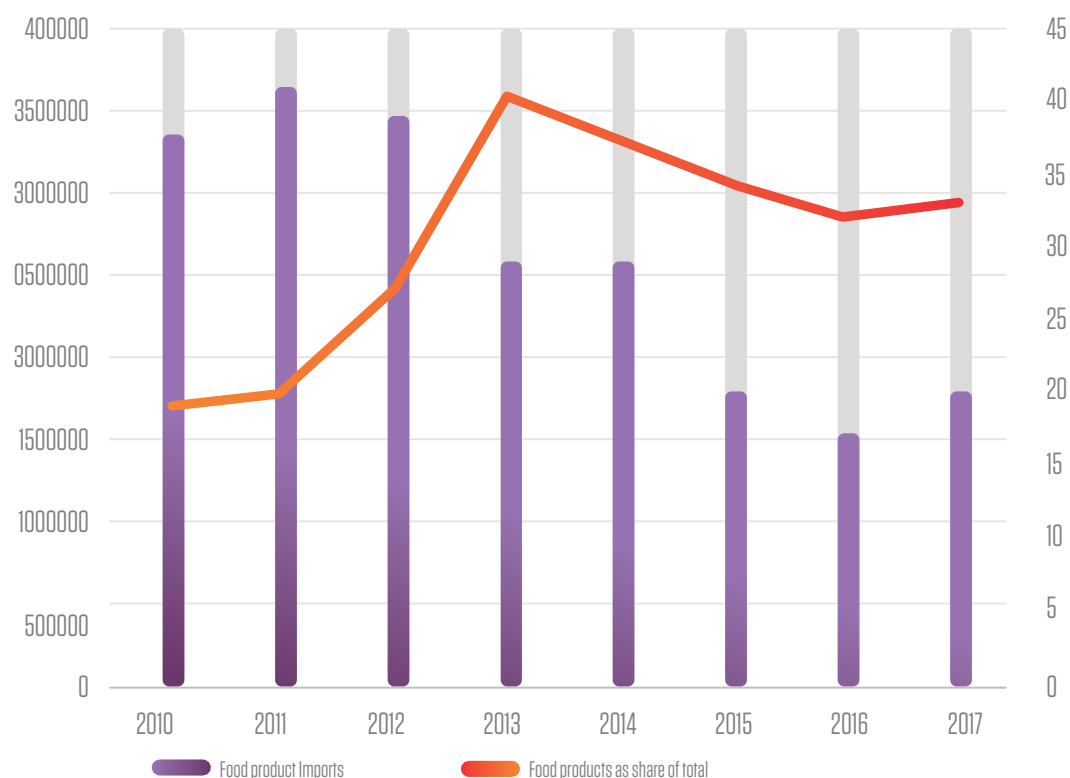
As the report mentioned earlier the region has always experienced fluctuations in the weather. Studies have shown that the overall trend of global warming in the region is consistent with global warming models affected by human activity, notably agriculture and economic activities based on high-carbon energy sources; it cannot, therefore, be attributed to natural change alone.

Many agricultural policies and industrial activities, based on feasibility studies which neglected environmental factors, either at the planning or implementation stage, contributed fundamentally to environmental degradation and came to pose a threat to sustainable development.

For example, desert cultivation and overgrazing and the random movement of machines have led to the deterioration of the natural pastures in Al-Badia. Desertification accelerated following the Government's decision to allow the cultivation of Al-Badia lands in 1990s, finally suspended by Al-Badia Law in 2006.

The use of uncontrolled water pumping and illegal drilling of wells, as well as of conventional irrigation methods, led to the deterioration of the water balance. The export of raw agricultural materials also resulted in the loss of value added from manufacturing processes (Westlake, 2001; Najafi et al., 2010; Katana, 2017).

Figure 34: Imported food products and their share of total imports



Source: Population Status Survey Syrian Center for Policy Research projections

As mentioned above, focusing on water-consuming crops and faltering the shift to the modern irrigation has increased salinity and water deficit, resulting in significant losses in natural resources and land productivity.

Thus, achieving increases in agricultural production during the 1990s was accompanied by major imbalances: an emphasis on water-consuming crops such as cotton, beets and wheat, biases against unsubsidized products, poor irrigation methods, over-exploitation of groundwater and desert tillage entailed negative impacts in desertification, soil salinity and loss of biodiversity.

Wars contribute significantly to the destruction of natural and human resources through the destruction caused by hostilities, looting, vandalism or toxic waste.

The historical examples of the environmental impact of wars are many, including the Vietnam War, where Agent Orange was widely used, a toxic herbicide and cause of health risks that continue to this day. Another example is the targeting of industrial sites and oil refineries in the Balkans that contributed to pollution of drinking water and soil in 1992, 1995 and 1999 (Zwijnenburg, 2016).

In October 2015, PAX published a study on the environmental and health impact of the conflict in Syria. The report cited four major issues arising from the conflict:

- Targeting and destruction of industrial facilities and major infrastructure as well as targeting military sites. Both may generate polluted areas due to the large quantities of hazardous and toxic substances located in such sites, especially industrial areas surrounding Aleppo, Homs and Damascus.
- The massive damage to residential areas and the exposure to the hazardous materials, leaving more than 60 per cent of the residential and industrial areas in Syria in danger. The conflict left millions of tons of rubble, often mixed with various types of medical, household and industrial waste. This can engender toxic respiratory problems caused by dust, skin diseases, cancers and congenital malformations caused by air pollution and the pollution of drinking water

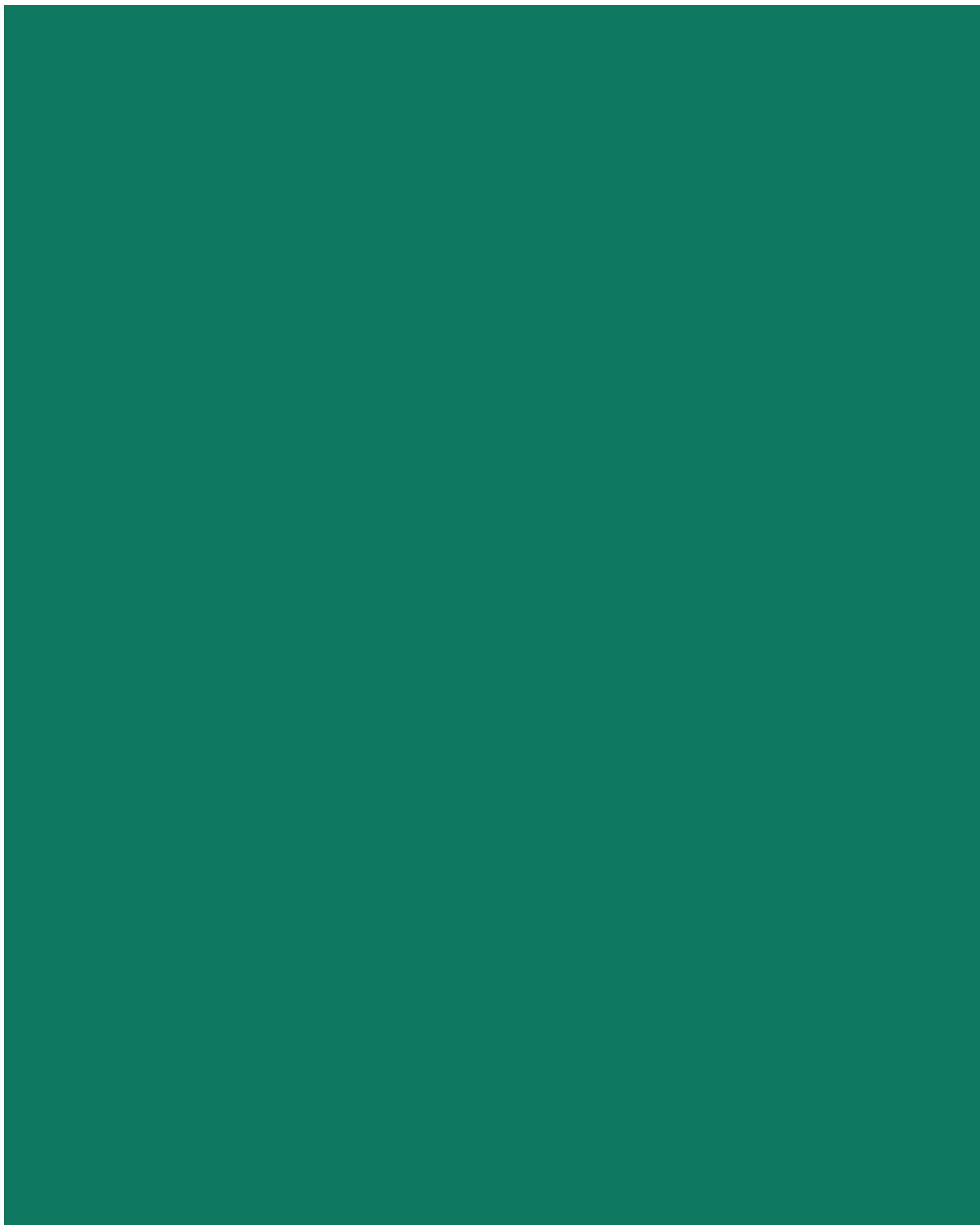
with heavy metals.

- Pollution caused by military materials, weapons and other explosive materials, resulting in the spread of toxic substances and heavy metals in residential areas may pose an immediate health hazard and long-term pollution threats to soil and water.
- The collapse of environmental governance and the absence of specialized waste management infrastructure and services, leading to a range of health risks. The accumulation of piles of waste on the roads can contribute to the spread of infectious diseases and contamination of soil and drinking water.

The study also showed a massive growth in domestic oil refineries at certain sites in Deir el-Zour; tens of thousands of these refineries in at least 37 locations in northeastern Syria are employing tens of thousands of civilians, including thousands of children, exposing them to toxic vapors and substances. These practices have also affected agricultural land and local water resources (Zwijnenburg and Pas, 2015).

In addition to pollution, the conflict has led to the waste of many natural resources such as forests and water resources as a result of destruction, vandalism or misuse, such as logging for heating or drilling of artesian wells in unsustainable ways. Waste and pollution factors affect the long-term potential of agricultural production and affect the quality of food production as well as directly damage public health.

The study also showed a massive growth in domestic oil refineries at certain sites in Deir el-Zour; tens of thousands of these refineries



CHAPTER 4

DETERMINANTS OF FOOD SECURITY

4.1 MODEL BUILDING

This section examines the determinants of food security and its relation to social, economic and institutional variables during the conflict. Accordingly, a cross-sectional and population-weighted regression model was developed and the overall food security index discussed in the previous sections was used as a dependent variable and a set of independent key variables were added. This test reflects the correlation between food security and the variables, and does not necessarily indicate a causal relationship between them. The research was based on data provided by the Population Survey (2014) during the conflict, and the model was tested for consistency and significance of results.

In the model, FSI was used as a dependent variable and a number of independent variables were chosen based on the literature and understanding of the research team consistent with the conflict situation in Syria.

The following independent variables were selected:

- **SCI:** A composite index of social capital.
- **Death:** Conflict-related mortality, to indicate levels of violence
- **Ins:** Institutions treated individuals equally to indicate relationships with institutions.
- **VE:** Involved in acts associated with violence to denote the relationship with violence economies
- **H:** A composite variable of several indicators of health status.
- **Idp:** Proportion of IDPs to the population in the hosting studied area.
- **Int_dep:** Percentage of the internally displaced to the population in the origin area studied.
- **Tot_dep:** Percentage of population displaced from the studied area inside and outside in the origin area studied.
- **Moh:** Adjustment for the variation between the governorates, not measured by the above variables such as cultural differences.

The regression was implemented according to three equations that differed in terms of the displacement variable. The first was the percentage of the total of the displaced from the area studied to the population. The second used IDPs (displaced to other areas inside Syria) from the area studied to the total population; the third used total IDPs to the total population of the studied area.

4.2 Model Results

The model presents an analytical reading of the relationship between the food security and a number of determinants affecting it, based on the

$$FSI1_i = c + SCI_i + Death_i + Ins_i + VE_i + H_i + Tot_dep_i + Moh_i + \varepsilon_i \dots \dots \dots (1)$$

$$FSI2_i = c + SCI_i + Death_i + Ins_i + VE_i + H_i + Int_dep_i + Moh_i + \varepsilon_i \dots \dots \dots (2)$$

$$FSI3_i = c + SCI_i + Death_i + Ins_i + VE_i + H_i + Idp_i + Moh_i + \varepsilon_i \dots \dots \dots (3)$$

construction of the Human Status Survey in 2014. The Table attached with appendix 2 shows the results of the model according to the three equations. The table shows the value of the parameters as well as the statistical error and statistical significance of the relationship as well as the standard coefficients, which measure the change in the food security index based on a change in one standard deviation of the independent variable. The standard coefficient can compare the importance of the role of independent variables (determinants).

- **Institutions:** Results show that the most important determinant of the food security is the institutional performance of dominant forces in the region. There is a statistically significant positive relationship between food security, institutional inclusion and non-discrimination among the population. In other words, imposition of power and the exclusion and mismanagement of the population in the areas studied is the central factor in the deterioration of the food security situation. This reflects the unprecedented use of armed violence by the conflict, the absence of the rule of law, the subjection of populations under siege or denial of access to food and decent living conditions. According to the analytical framework of the political economy of food, we see the emergence of many authoritarian forces during the conflict, destroying natural resources and infrastructure, harnessing resources for war, eliminating producers, distributors and consumers in the food security system, and displacing the population to sustain its hegemony. The various powers in play have wasted and destroyed human and material resources and forcibly redistributed wealth, power and opportunity to suit them as institutions of violence, intimidation and exclusion. These policies have resulted in enormous inequities and large disparities among social groups in terms of food security.
- **Public health:** The public health index, which was constructed from sub-indices that represented the prevalence of both infectious and chronic diseases during the conflict for adults

and children. The results of the model show a statistically significant positive link between the food security index and the state of health. These findings are consistent with previous literature that show the strong relationship between food security and the state of health in society. The failure of the food security system directly affects the health of individuals as well as the decline in the health system and living conditions.

- **Social Capital:** To measure the relationship between the food security index and social relations in the region studied, the Social Capital Index based on the Human Status Survey 2014 (SCPR, 2017) developed measure social networks, trust, values and customs in food security. The model shows the positive and significant relationship between the food security index and the social capital index. These results show the importance of trust, solidarity, cooperation and volunteering as factors in alleviating the food security crisis during the conflict. The breakdown of social relations through polarization, the spread of violence, hatred, discrimination, rejection of the other and politicization of identity through incitement based on religion, nationality, region or sex has contributed to the deterioration of food security. This is an issue that needs further research and investigation, as there is a large gap in knowledge of the role of culture and informal institutions in reducing the loss of security, including food security. Violence here covers murder, abduction, theft, looting, rape, child exploitation and monopolization, all of which lead to disintegration of social solidarity and of society's ability to cope with disasters and conflicts. Consequently, peace-building, integration and social cohesion are at the core of strategies to overcome food insecurity.
- **Deaths:** Syria has suffered huge loss of lives consequent to the intensity of military operations and gross violations during the conflict in Syria. The model uses the mortality rate resulting from the conflict among the residents of the area studied relative to its population. The

Results show that the most important determinant of the food security is the institutional performance of dominant forces in the region. There is a statistically significant positive relationship between food security, institutional inclusion and non-discrimination among the population

- results indicate a statistically significant negative correlation between the food security index and the deaths due to the conflict. It is an indicator of the extent of participation in or exposure to direct violence during the conflict. It has major implications; most of the dead belong to productive age groups, which will impact food security in terms of production and household capacity to provide income for food, as well as distorting the structure of families and communities.
- **Forced migration:** More than half of Syria's citizens have been displaced due to conflict, whether internally or externally. They have lost the environment in which they built relationships and businesses, to become susceptible to all kinds of violation and marginalization. There are three indicators of migration; the first is the percentage of all displaced individuals (including refugees abroad) to the area's population. It shows the statistically significant negative relationship between the food security index and forced migration, as populations fled from areas that had acceptable conditions to have food security. This result also applies to the percentage of internally displaced persons in the second model, where internal forced migration rates rise with the decline of food security. Finally, in the third model, we used the percentage of IDPs present against the total population of the area studied. The results show a statistically significant positive relationship between the percentage of IDPs in the area and the food security index; in other words, the IDPs seek to move to areas with higher percentages of food security, including areas that receive nutritional or humanitarian aid. This connection shows the importance of including the decline in food security when addressing the issue of the voluntary return of IDPs to their areas, so as to guarantee decent life conditions.
- **Violence economy:** The indicator used was involvement in illegal activities notably smuggling, theft, looting, and participating in hostilities. The results showed a negative relationship between the spread of violence economy activities and the food security index. As the structure of power and wealth is changed through violence, the impoverishment of society was exploited and the basic conditions of everyday life were destroyed by the subjugating powers. The spoils of

war provided incentives for loyalists and involvement in violence. This new economic structure produced warlords and trans-border capitalists, the dominant actors directly contributing to the food deprivation of most citizens by looting, monopolization, market speculation, smuggling, unlawful taxation and the exploitation of humanitarian aid through monopolization or discriminatory distribution. Dismantling the war economy is an important strategy to transform into the regions of Syria into inclusive, productive economies providing food security through productive activities for fair opportunities and resource sustainability.

4.3 Food as a weapon in conflict situations

Food insecurity threatens political and social stability, expands the potential for political unrest and emerges as the most serious indicator of institutional failure. Food insecurity clearly reflects political institutions, levels of development, past conflicts, social safety nets and population pressures. Armed conflict negatively affects food security as food is used as weapon between the conflicting parties. It is necessary to focus on methods and mechanisms that protect human beings and ensure that they receive adequate food even in situations of armed conflict (Henk-Jan Brinkman and Hendrix, 2010; Gleditsch et al. 2002; Collier et al. 2003).

The nexus between food insecurity and conflict can be explained by expectations of people who join the conflict to promote the economic and social grievances (where food security one of these grievances); and to what extent this conflict may improve the future human life of those people or conversely to what extent may bring damages. (Gurr, Humphreys and Weinstein, 2008; Blattman and Miguel, 2010). Studies have confirmed that the proportion of conflict and violence is relatively higher in low-income countries or countries without ineffective human rights institutions (Von Braun, 2008).

The problem of the Syrian situation was complex. Food security levels were relatively high in terms of abundance and accessibility before 2011, but were accompanied by weaker levels of sustainability and equality. Levels of food poverty were very low, but the conflict contributed to a disastrous food

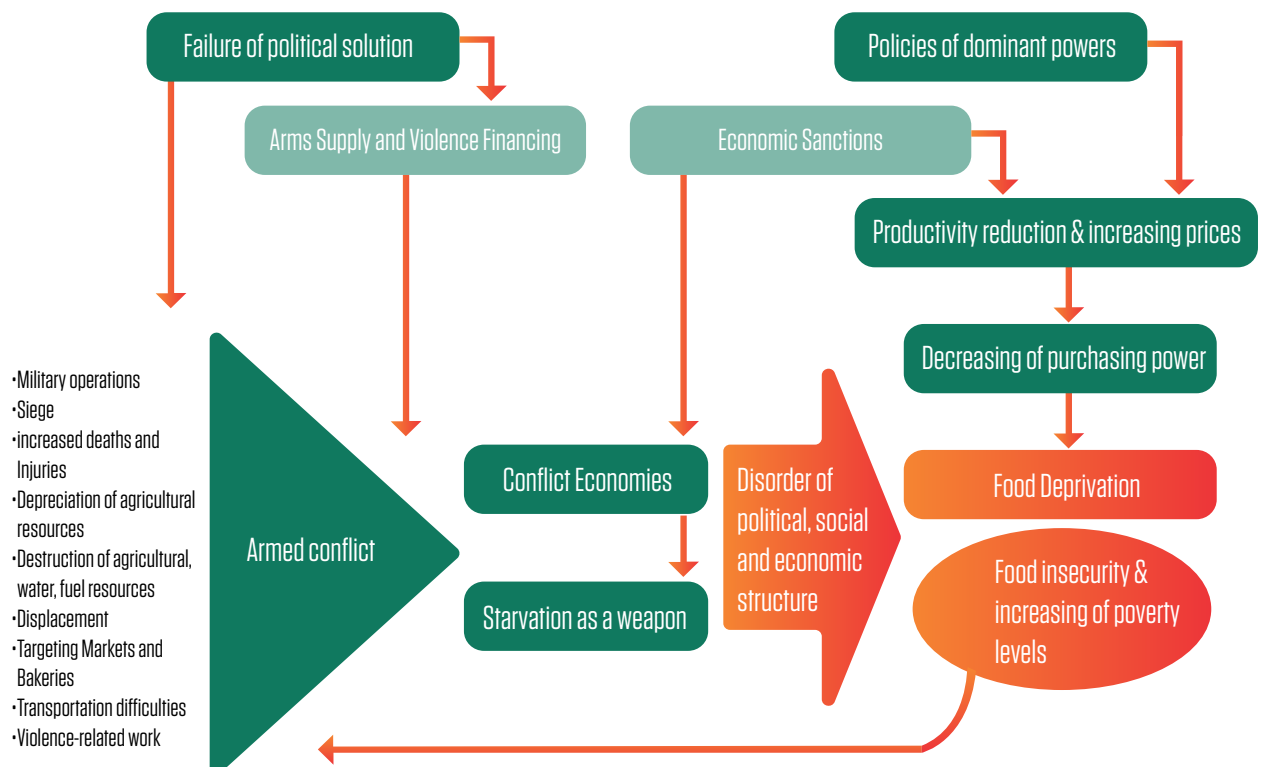
The structure of power and wealth is changed through -violence, the impoverishment of society was exploited and the basic conditions of everyday life were destroyed by the subjugating powers. The spoils of war provided incentives for loyalists and involvement in violence. This new economic structure produced warlords and trans-border capitalists

security situation, which made the country largely dependent on humanitarian assistance. The question is how the role of food security has changed from a tool of stability to a tool of conflict, and has food insecurity become a trigger for continued violence? How has uneven access to food contributed to strengthen the social rifts and the political polarization?

In the case of the conflict in Syria, **the armed clashes exacerbated the food crisis but have become both cause and effect**. Armed conflict caused the destruction of natural and natural agricultural resources, infrastructure, energy and water resources. It resulted in a high number of deaths and an increasing number of displaced people living in difficult living conditions. Economic collapse in turn attracted the labor of specific groups of the population. Many joined fighting in the war because there were no alternatives capable of providing a minimum standard of living. In turn those who refused to be involved in the war came to face increasing poverty and marginalization.

Food was used as a weapon by all conflicting parties through sieges tactics and the targeting of popular markets, bakeries and water resources to subjugate the people. The conflict also contributed to the rise in prices caused by the decline in production, incomes and employment opportunities, the adoption of policies to reduce support and social protection, the channeling of resources towards military spending, as well as looting, theft and resource monopolization. The deterioration of the food security situation has resulted in a narrowing of the options available to individuals and the widening of the oppressed class, leading to greater involvement in war. The amount of foreign aid targeting marginalized and poor groups not been able to meet their growing needs in the absence of political solution initiatives. As a result, the conflict has persisted for many years, and continues in some areas, resulting in further food shortages. Figure 35 shows the vicious circle between violence and food insecurity.

Figure (35) Relationship between armed conflict and food security





CHAPTER 5

POLICY OPTIONS TO ADDRESS FOOD DEPRIVATION

This report presented an analysis of food security in Syria before the conflict, in terms of the political economy of agriculture, and during the conflict. A composite index for food security was constructed and its results for before and during the conflict analyzed according to its sub-dimensions: availability, access, utilization, stability and sustainability. Finally, an econometric food security analysis identified the determinants contributing to the worsening food security situation during the conflict.

Prior to the conflict, Syria enjoyed high levels of availability and access to food but suffered from poor use and sustainability as well as uneven regional performance. The development model in Syria witnessed radical transformations in the new millennium with the adoption of neoliberal policies that marginalized the agricultural sector, reduced subsidies, reduced the role of farmers and the countryside, reduced employment creation, expanded the informal economy and increased poverty. Environmental challenges have also been exacerbated by the absence of strategies for sustainability.

The conflict has formed new political, social and economic structures centered on violence and injustice and has resulted in a catastrophic deterioration in food security rates affecting the lives of millions of people. Violations of rights have been compounded by the absence of the right to food. The food security dimensions of human, material and social capital have suffered heavy losses, as dominant actors used food deprivation to subjugate and punish the population. Sieges were one of the darkest parts of the conflict, with millions suffering from starvation policies.

Food deprivation has affected all Syrians but in varying degrees as the conflict deepened population

disparities by region, gender, political affiliation and loyalty to various actors. According to regions and social strata, people experienced different intensities of military operations, displacement, destruction of infrastructure, the decline of social capital, the deterioration of public health and economic activity, the absence of the rule of law, and the spread of looting and vandalism.

The considerable efforts of local communities, expatriate groups and international organizations to provide humanitarian assistance have been unable to cope with the immense needs caused by the conflict. The economies of violence have also absorbed part of the aid to serve subjugating actors and warlords.

Suggestions and recommendations:

The concept of food sovereignty affirms the right of everyone to benefit and to share in natural resources and production. This entails support for sustainable livelihoods, respect for the work of food producers, localization of food systems, and the need to develop knowledge and skills through the development of research and studies that contribute to local production and to maintaining the ecosystem and natural resources. Thus, work on achieving food security in its broadest sense is linked to several economic levels: the national, the

According to regions and social strata, people experienced different intensities of military operations, displacement, destruction of infrastructure, the decline of social capital, the deterioration of public health and economic activity, the absence of the rule of law, and the spread of looting and vandalism

local, and the household. The different sectors of agriculture, irrigation, energy, services and the environment need to be brought together in research to improve food security. In addition, there must be an appropriate environment to achieve this, through a democratic functioning to guarantee public and private freedoms, and protection of the human rights.

The recent Syrian experience highlighted fundamental gaps in the analytical framework and policies proposed to achieve food security. The right to food must be ensured in times of peace and those of war, which requires a clear mechanism to counter the use of food as an instrument of war with the objective of forcing members of society to make compromises on their basic human rights, freedom and dignity. The use of food as a weapon must be treated locally and internationally as a war crime lest the current circumstances creating humanitarian disasters, famines and epidemics become those of the future. Below the report suggests some policies to overcome food insecurity resulting from armed conflict.

At the national level:

- The highest priority is to stop violence and to dismantle authoritarian institutions through a radical transformation process that ensures broad community participation to build participatory, efficient and accountable institutions capable of addressing the grievances and harm of conflict, establishing respect for rights, and ensuring human security. This will be a major challenge considering the attitude of the dominant powers and systems controlling power and wealth and marginalizing most of the population. Inclusive institutions are needed to overcome abuses and to establish food security in terms of availability, access, use and sustainability for all.
- Building the productive economy to replace the economies of violence, through positive stimulation of productive work and of the participation of women and men in economic activities not based on rent, exploitation and waste of resources. This approach requires a particular focus on rural stimulation and agricultural production. In addition, policies that severely restrict violence-based activities such as looting, unfair

taxation, monopolies and smuggling should be implemented.

- Work on community reconciliation and investment in building trust and solidarity among individuals as an essential part of addressing the causes of food deprivation.
- Development of criteria to target the most affected groups and areas of food deprivation and gradually to reduce dependency on aid through development policy that encourages productive work and fair distribution.
- Enabling and empowering the role of civil society and the private sector by granting public and private freedoms, including freedom of expression, and accountability for the practices of the conflicting parties, as well as criminalizing the use of food as a weapon.
- Development of a plan to remedy the damage to natural resources from waste and pollution that has affected agricultural production.
- Rehabilitation of the agricultural sector through:
 1. Rehabilitation of arable land damaged during combat operations through inclusion in a special agricultural plan that takes into account the destructive effects of war and the environmental impacts of different types of weapons used.
 2. Rehabilitation of irrigation systems, dams, groundwater and artesian wells that supply irrigated land with water needs, the provision of raw materials for pumping water such as electricity and fuel, the resumption of modern irrigation projects and their expansion to all irrigated agricultural lands, as well as stopping the drilling of random wells that have exhausted water resources.
 3. Provision of seeds, fertilizers and food for agricultural producers and rehabilitation of wetlands and livestock sheds destroyed during the war, ensuring stable prices of seeds and fertilizers and expanding access to agricultural loans with differential benefits to producers according to the scale of damage caused by war in areas affected by military and subversive activities.

The highest priority is to stop violence and to dismantle authoritarian institutions through a radical transformation process that ensures broad community participation to build participatory, efficient and accountable institutions capable of addressing the grievances and harm of conflict, establishing respect for rights, and ensuring human security

- Planning for the return of persons displaced by war to their areas and cities, rehabilitating public facilities, schools and hospitals, and providing long-term housing loans for the reconstruction of houses and residential areas, thus ensuring the availability of agricultural labor that has emigrated and been displaced by the war.
 - Review of the agricultural policies adopted by the government to implement policies that will contribute to food security and improve the economic efficiency of production. As part of this, acting against monopolization, which contributed the rise in the prices of production inputs and hindered the provision of subsidized agricultural inputs to beneficiaries. Lastly, controlling the prices of production inputs affected by high exchange rates and difficulties in transportation, together with expansion of farmers' options through agricultural loans.
 - Stimulate the labor-intensive, productive economy to provide jobs within a sustainable urbanization plan.
 - To reduce poverty and rising costs of living, which have been greatly exacerbated by the war, through a set of macro policies:
 1. Adopting a clear monetary policy with a goal of ensuring price stability, whereby the central bank controls the exchange rate and lower interest rates to achieve a price stability which in turn contribute to the stabilization of the cost of living. Enhancing the role of cooperatives that can provide all the basic needs of citizens at prices that compete with local market prices.
 2. Provide employment opportunities for young people and women and develop social security programs with a particular focus on families that have lost their breadwinners as a central part of the social reconstruction plans.
- At the local level:**
- Assess the damage caused by the war at the local level and work to form local teams from the public and private sector and civil society to follow up the implementation of reconstruction plans and rehabilitation of agricultural land, dams, irrigation systems, public facilities, and private and public property to ensure the participation of the community in the process of reconstruction and rehabilitation.
 - Develop empowered institutional structures at the local level to overcome the effects of conflict and build capacity in effective implementation of local development.
 - Actuate the role of the community as represented by civil society organizations concerned with food and environmental security and enable them to fulfil their role through their participation in decision-making and expression of the demands of the community.
 - The participation of the local community in the development of plans and budgets for reconstruction by the formation of local committees specialized in the agriculture and food security sector to represent the local community and to cooperate with state institutions and local initiatives thereby expanding the margin of administrative and economic independence of the local councils so as to play their role quickly and effectively at the level of development.
 - Provide employment opportunities for citizens as a priority in the areas where the displaced

need to return and resettle.

At the family level

- Ensure the availability of essential foodstuffs in the local market at appropriate prices, raise the value of wages so as to take into account the required food basket, provide job opportunities to reduce unemployment, develop social security programs for families that lost their breadwinners and support the disables.
- Provide an appropriate environment for increase women's participation in work, ensure decent working conditions and increase their economic role in the production and distribution stages.
- Ensure access to food, and increase the purchasing power of Syrian families through the availability of employment opportunities, wage increases and price controls. Actuate the role of consumer protection organizations and civil society organizations to ensure the quality of food and to put an end to monopolization, which contributed to the distribution of low-quality products at high prices.
- Providing drinking water to all Syrian families as a top priority by rehabilitating public networks supplying drinking water and monitoring means of sterilization.
- Provide petrol products, including cooking gas to all regions at reasonable prices, control of sales by local brokers and the development of deterrent penalties for violations related to distribution and prices on the black market.
- Ensure sustainable food security through the provision of food commodities.



REFERENCES

English References

- » Barrett, C. B. (2010) "Measuring Food insecurity" *Science* 327, P. 825-828
- » Blattman, C. & Miguel, E. (2010) "Civil War" *Journal of Economic Literature* 48(1): 3–57
- » Boeing, G. (2016). "How Our Neighborhoods Lost Food, and How They Can Get It Back". *Progressive Planning*. 2016 (Winter): 35–37. Retrieved 2016-10-12
- » Brinkman H. J. and Hendrix C. S. (2010) Food Insecurity and Conflict: Applying the Wdr Framework" *World Development Report 2011 Background Paper*
- » Brinkman, H. J. and Hendrix C. S. (2011) "Food Insecurity and Violent Conflict: Causes, Consequences, and Addressing the Challenges" *World Food Programme's Occasional Paper*, No. 24.
- » Collier, Paul; Elliott, V.L. Hegre, H.; Hoeffler, A.; Querol, M. R. and Sambanis, N. (2003) "Breaking the Conflict Trap: Civil War and Development Policy" Oxford: Oxford University.
- » FAO (1997) "The food system and factors affecting household food security and nutrition" *Agriculture, food and nutrition for Africa: a resource book for teachers of agriculture*. Rome: Agriculture and Consumer Protection Department. Retrieved 15 October 2013
- » FAO (1997) "The food system and factors affecting household food security and nutrition". *Agriculture, food and nutrition for Africa: a resource book for teachers of agriculture*. Rome: Agriculture and Consumer Protection Department. Retrieved 15 October 2013.
- » FAO/WFP (2018) "Crop and Food Security Assessment" Special Report. <http://www.wfp.org/food-security/reports/CFSAM>
- » Garrett, J; Ruel, M. (1999) "Are Determinants of Rural and Urban Food Security and Nutritional Status Different? Some Insights from Mozambique" Washington, D.C.: International Food Policy Research Institute. Retrieved 15 October 2013.
- » Gleditsch, N. P.; Wallensteen, P.; Eriksson, M.; Sollenberg, M. and Strand, H. (2002) "Armed Conflict 1946–2001: A New Dataset" *Journal of Peace Research* 39(5): 615–637.
- » Gordillo, G. and Ménde, O. (2013) "Food Security and Sovereignty" FAO
- » Gurr, T.R. (1970) "Why Men Rebel" Princeton, Princeton University Press
- » Humphreys, M.A. & Weinstein, J.M. (2008) „Who Fights? The Determinants of Participation in Civil War" *American Journal of Political Science*, 52(2):436–455.
- » Kelley, P. C., Mohtadi, S., Cane, A. M., Seager, R., and Kushnir, Y., (2015) "Climate change in the Fertile Crescent and implications of the recent Syrian drought" Edited by Brian John Hoskins, Imperial College London, London, United Kingdom.
- » Levetin, E., McMahon, K. (2008): "Plants and Society", Chapter 11: "Origins of Agriculture", Fifth Edition. The McGraw–Hill Companies.
- » Maddison, A (2003) "The World Economy: Historical Statistics", Development Center studies, OECD. <http://www.globaljustice.org.uk/six-pillars-food-sovereignty>
- » Selby J., Dahi S. O., Fröhlich C., Hulme, M. (2017) "Climate change and the Syrian civil war" *Political Geography* Volume 60, September, PP 232-244 <https://doi.org/10.1016/j.polgeo.2017.05.007>
- » Tweeten L. (1999) "The Economics of Global Food Security Applied Economic Perspectives and Policy" Volume 21, Issue 2, Pages 473–488,

<https://doi.org/10.2307/1349892>

- » United Nations Committee on Economic, Social, and Cultural Rights (1999) "The right to adequate food" Geneva: United Nations
- » UN ESCWA/St. Andrews University (2016) "Syria at War: Five Years On." https://www.unescwa.org/sites/www.unescwa.org/files/page_attachments/syria-war-five-years-english_3_0.pdf
- » Von Braun, J. (2008) "The World Food Crisis: Political and Economic Consequences and Needed Actions" Presentation to the Ministry of Foreign Affairs, Stockholm, Sweden, September 22
- » Whole of Syria-Food Security Sector (2017) "Food Security Situation in Syria" Whole of Syria
- » Zwijnenburg, W. and te Pas, K. (2015) "A desktop study on the environmental and public health impact of Syria's conflict" PAX, Amidst the debris... ISBN: 978-90-70443-86-3
- » Zwijnenburg, W. (2016) "The Human Cost of War's Environmental Impact" Syria untold, <http://syriauntold.com/2016/10/the-human-cost-of-wars-environmental-impact/>

Arabic References

- » Al Najafi, Imad Hasan et al (2010) 'Political Agriculture and the Prospects of Achieving Food Security: Indicators of the Syrian Agricultural Economy', Tanmyat ar-Rafidayn, issue 100, volume 32, P: 67 - 81 (In Arabic)
- » Salem, Hamdi (2000) 'The Final Report on Food Security' Assistance in Institutional Strengthening and Agricultural Policy Project, FAO. Damascus, Syria
- » Mohamed, Shawqi (2016) 'Livestock in Syria: High Production Costs and Under Threat'. Al Hal website (in Arabic)
- » Mohamed, Shawqi (2017) 'The Reality of Olive Oil Production and Export in Syria in the Past 7 Years'. Al Hal website (in Arabic)
- » Mohamed, Shawqi (2016) 'The Electricity Sector in Syria Falls Apart Under the Weight of Conflict'. Al Hal website (in Arabic)
- » Katana, Hassan (2017) "Impact of the Crisis in Syria on Agricultural Production and Food Security 2005-2016", background paper, Syrian Center for Policy Research (in Arabic)
- » Westlake, Mike (2001) 'Final Report on the Strategic Crop Sector' Assistance in Institutional Strengthening and Agricultural Policy Project, FAO. Damascus, Syria



APPENDIX

APPENDIX 1: FIELD SURVEY OF THE POPULATION SITUATION

Field survey methodology

The field survey supporting the Population Status Report 2014 aims to describe and understand the demographic, economic, social and institutional situation of the population in Syria, as well as provide the basis for studying and analyzing the effects of the conflict. The goals include:

- Characterization of the geographical distribution of the population in terms of displaced persons and residents in their areas and the movement of the population.
- Identification of the most important demographic characteristics of the population throughout the country.
- Description of the general characteristics of the economic situation of the population in terms of employment, economic activities and the most important sources of income.
- Characterization of living conditions in terms of housing conditions and infrastructure.
- Description the health and education status of the population.
- Characterization of inequality and poverty.
- Characterization of the main social characteristics of the population.
- Nature and effectiveness of existing institutions.

In view of the special nature of the survey under the complex circumstances of the crisis, the research team and the central team worked on developing the methodology to allow qualitative and quantita-

tive indicators to simulate the changing reality in an exceptional manner. Therefore, complex stages of the survey have been developed, including the use of available secondary data, obtaining data from individuals present and active in the study areas, cross-referencing the data at more than one level to verify its credibility, and approaching the new phenomena generated by the crisis in their demographic, economic, social and institutional aspects. Consultations were held with researchers from different disciplines to agree on the technical framework for implementation. The search tools, such as the search form, the researcher's guide, the integration guide, and the emergency report were prepared to serve the purpose of the research. Consultations on the mechanism of access to hot spots and of ensuring coverage of all governorates were also discussed. The survey was carried out in partnership with the Syrian Commission for Family and Population Affairs, the Central Bureau of Statistics and a team of independent researchers, in collaboration with various public bodies such as the Planning and International Cooperation Authority, the Social Aid Fund and some non-governmental organizations such as the Syrian Arab Red Crescent Society.

The research covers all resident and displaced populations throughout Syria. Fieldwork was carried out through questions directed at key people in their areas, taking into account the following points:

- The geographic study unit is the "district" in all the Syrian regions and governorates, and the "neighborhood" for the city centers. Three key people were interviewed in each studied area.
- After consultation of the coordinator of the team

in the governorate and the central team on the homogeneity of the area, in cases of heterogeneity, the area was separated into more one than an area for study (based on groups of villages) and the survey was carried out on this basis. The criteria for heterogeneity between districts depend on the effects of the conflict on the humanitarian and material aspects of the district.

- A list of the researcher's observations were attached to the form. If they are unable to physically access due to the seriousness of the security situation, the secondary data shall be used for scrutinization. The basis is the presence of the researcher and the key person in the studied area.
- Field work in hot spots was carried out through:
 - Reliance on researchers from the studied areas if possible
 - Meeting people familiar with the situation who can be interviewed outside the region
 - Personal, electronic or telephone interview
 - Continuous communication to monitor the dynamics of the situation during the surveying period.

Criteria for the selection of key persons include the need to know the subject area and their objectivity irrespective of their affiliations, and to have the ability to obtain up-to-date information and data relating to the studied axes (socio-demographic and institutional). The criteria for key people are defined by the following points:

- A governorate citizen and preferably a resident of the studied area
- Interest in and knowledge of the conditions of the studied area
- Representing the local community
- Representing various intellectual and professional backgrounds
- Experience and involvement in work for the public good

- Representation of women and different age groups

The Survey Team

The working group consists of experts, researchers, specialists, administrators and representatives of research partners. The team includes three core working groups: the research team, the field work team and the technical team.

The field team includes the provincial teams and consists of the team coordinator and a number of field researchers. Teams were trained by the research team. The field team's tasks are:

- Identify the work plan in terms of the framework and time in coordination with the research team.
- Determine the scope of work in terms of geographical areas and the data available in each governorate based on a preliminary proposal by the research team.
- Collect available secondary data and information on the governorate.
- Nominate key persons in accordance with agreed criteria with the central team.
- Conducting interviews with key people, adhering to the researcher's guide and writing a list of observations.
- Reports in case of emergency in coordination with the research team.
- Provide the research team with all information and data obtained scrutinized.

Criteria for selecting researchers were adopted in the survey, which is non-traditional research and conducted in complex and dangerous conditions. The teams were formed through the selection of the researchers by the Central Bureau of Statistics. Independent researchers were also invited to participate, as well as volunteers from different quarters. Final selection of researchers was done after the training sessions. The criteria for choosing the researchers are to be residents of the studied governorate with at least a secondary education certificate and experience in research, statistical and field work, especially in the social sciences, in

addition to objectivity, scientific honesty, willingness to volunteer and the ability to communicate.

A periodic evaluation of the performance of the teams was carried out by the Central Team, which carried out daily follow-up and several verification field visits. Provincial supervisors were also concerned with the follow-up of researchers' performance. For example, a large part of one governorate team was excluded and the team was restructured. Several researchers who did not comply with performance criteria were also excluded. Another evaluation of the work of the teams occurred during the verification of forms, which resulted in the return of some forms to the field and the exclusion of some researchers.

Four intensive training workshops were conducted on the mechanism of implementing the survey, during which the objectives of the population status report, the survey and the work methodology were clarified, and the questionnaire and the researcher's manual were explained interactively and the mechanism and rules of integration and research ethics were clarified. The researchers provided secondary data on the areas studied including information on population, education, age and gender structure, labor market relations, family expenditure and pre-conflict facilities to understand the area studied. Preliminary trails were conducted on the selection of the areas studied.

Survey Instruments;

A number of tools were used for the survey, the first being the secondary data and information including all the official and non-official publications, studies and reports related to the area studied. The research team used secondary data from various sources, especially from the Central Bureau of Statistics for the pre-conflict period. Work was conducted on labor force surveys, household income and expenses, family health status, industrial establishments and population censuses, as well as data on national accounts, education and data on civil records.

The main tool of the survey was the questionnaire, which contains qualitative questions prepared according to the main axes of the research covering the demographic, economic, social and institutional aspects. It was designed by the research

and technical team and with the participation of the provincial teams. The questions and the detailed researcher's guide have been developed by the research and technical team to ensure that the questions are accurately described. The form included a section containing a list of the researcher's observations and prepared so that the researcher can record the phenomena and indicators prominent in the area studied, which enables comparison with the answers of key people as a means of verification. Each form is filled out by one key person and not more than one person. The key person has the right to gather information from the people they deem appropriate, but the researcher does not ask more than one key person to complete the same form.

After preparing the three forms for each area studied, these forms are integrated into a new form, according to the integration manual, by the supervisor of the governorate team and the relevant researchers in the studied area. If there is a contradiction in any of the qualitative questions or significant differences in quantity or in the explanation, the key persons are contacted to make sure, and if the discrepancy continues in the results, additional forms implemented for a more objective approach to the reality of the area studied. The merging of forms by the field team aims at avoiding reliance on arithmetical averages and at excluding forms that show bias or a lack of understanding of the status of the area studied in the field and before data entry.

The teams were instructed to prepare emergency reports, meant to detect changes in the studied area during the survey period and after it, thus updating data changed due to extraordinary circumstances. The research team also drew up a code of research ethics meant to be followed by participants in the survey so as to guarantee data confidentiality, researcher and key person safety, and the objectivity of results.

Implementation of field work

More than 250 researchers, experts, supervisors, verifiers, coordinators, programmers and administrative assistants were deployed in the field survey, divided between the research team, the technical team and the field team. Each team identified the studied areas from the level of the district and

neighborhoods within the centers of the provinces, with the possibility of subdivision of the area due to the absence of homogeneity in the area studied in terms of the effects of the conflict. The number of areas studied reached 698 distributed across the governorates (Table A). In this one observes an increase in the number of districts in the larger, more populous governorates which are more affected by the negative consequences of the crisis.

contact them. In the case of the key person's refusal prior to the start of the interviews or of failure to complete the form, an alternative key person was selected so that three key persons can be found for each area, taking into account their safety. The teams faced a challenge in selecting key people from diverse intellectual, cultural and political backgrounds who were not polarized or engaged in violence

The provincial teams selected the key persons on the basis of the required criteria and maintained

Table A: Distribution of the studied areas and forms and duration of interviews of the key person by governorate

	Studied areas	Total number of forms	Average length of interview
Damascus	55	220	5.86
Aleppo	138	552	3.85
Rural Damascus	100	399	2.40
Homs	45	180	5.19
Hama	43	172	4.44
Lattakia	50	200	4.66
Idelb	47	188	5.24
Al-Hasakah	40	160	3.28
Deir el-Zour	45	180	4.73
Tartous	37	148	4.82
Ar-Raqqa	12	19	4.31
Daraa	57	228	3.24
Sweida	22	88	3.33
Quneitra	7	28	5.14
Syria	698	2762	4.10

Source: Population Status Survey Syrian Center for Policy Research projections

Three forms of three different key persons were collected from each area save Ar-Raqqa, where three key persons were not available in all areas. The forms were then integrated by the field team in each governorate. It is noteworthy that one of the conditions of the research is that one researcher does not interview the three key persons in the same area to avoid the bias on the part of the implementing researcher.

Most interviews were conducted between the fourth and the sixth month of 2014, while some cases required a return to the field in the seventh and eighth months. Most forms required more than one interview with the key person and sometimes reached three interviews, as a result of the complexity of the form, which required time from key persons to gather and scrutinize the information requested.

The interviews lasted for a long time. The average time for interviews was 4.1 hours (Table 2), which required great efforts by researchers and key people, and varied between provinces and regions according to circumstances. This time does not include the integration form carried out by the team of researchers in the governorate. It is noteworthy that the survey did not provide any monetary incentives for key people who allocated long hours to complete the forms.

52 per cent of the interviews were conducted within the studied area and 48 per cent outside. The interviews were not conducted in some of the studied areas in the governorates of Deir el-Zour, Aleppo, Ar-Raqqa, Rural Damascus, Idleb, Hama and Daraa which suffer from terrible circumstances during the conflict.

95 per cent of the interviews were conducted through a direct interview with key people, 4 per cent by phone, and only 1 per cent were conducted as electronic interviews. The high percentage of face-to-face interviews can be explained by the flexibility of the interview venue, where the interview was made available outside the area studied if necessary, but in some areas, it was not possible to communicate directly with key people, prompting the use of electronic means.

The average age of key persons was 46 years at the national level and the ages ranged from 19 to

83 years. The variation was linked to the criteria for the selection key of persons in terms of their work in public affairs and their broad knowledge of the area studied. The gender balance criterion was not achieved in the selection of key persons, with only 8 per cent of the total number of key persons being women. This can be explained by the circumstances of the conflict on the one hand and the social role of women, which is clearly biased against them. The survey team tried to balance the composition of the provincial task forces, with the percentage of women was 39 per cent of the total researchers in these teams.

The educational level of key persons was considerable, largely in line with the criteria for selecting key persons for the survey to be familiar with different aspects of the studied area. The percentage of university degree holders and institutes is 65 per cent, secondary certificate holders 23 per cent, holders of the basic education certificate 11 per cent, primary certificate holders and less than 1 per cent.

After completing the interviews with the key people, the forms of each area were merged into one form by the field teams in the governorates according to the integration manual. All the forms were sent to the research team, where teams were formed to scrutinize the detailed forms. These teams worked collectively to check the completion of the forms and the commitment to research and integration criteria and the match between the textual explanation of the quantitative data and the observations of researchers. In the case of major imbalances, forms were returned to the field to modify observations. In the case of slight imbalances, telephone calls were made by field teams to make the amendments. Coding teams then worked on coding lists for related questions to facilitate input and subsequent analysis, such as coding "other" or coding new economic activities in different regions, and integrating coding into the input program by the technical team.

The technical team at the Central Bureau of Statistics prepared the input code, which included some preliminary verification rules. Digital input was also made by the Central Bureau of Statistics team for all forms, i.e. field forms and the integration form. Then the research team designed a program to verify the accuracy of data and consolidation and

produced detailed reports of the observations, with the input team and the research team working to modify them according to the rules or to return the forms to the field teams.

The survey resulted in more than 100 indicators for each of the areas studied that can be aggregated at the level of districts, regions, governorates and nationwide. Programs to analyze the results were prepared by the technical and research team, which included data and indicators for demographic, economic, living, learning, health, social and institutional sectors. The data was produced and reviewed by the research and technical team at the level of the areas studied. The results were analyzed by a multidisciplinary technical team on population, economic and social issues.

The report uses data entry software (CSpro), indicator production (SPSS 21) and data analysis (Stata 12, Eviews 7). MORTPAK 4.3 and Population Analysis System PAS were used to conduct demographic analysis and projections, as well as

ArcGIS (10.2. 2) for maps.

In general, the report adopts a holistic methodology with regard to the population status in terms of political and socioeconomic conditions based on rights and embraces the concept of development as an extension of human choices, equal opportunities, and the right to empowerment and participation. It also relied on the efforts of a large group of experts to review key issues relating to the pre-conflict population. Work has been done in complex conflict situations for development of the methodology and tools to reflect the challenges that have arisen. A comprehensive field survey was carried out in terms of geographical coverage and the issues addressed. It also relied on the results of the field work mainly in diagnosing the situation of the population during the conflict from various developmental aspects, drawing on the relevant literature and background papers prepared in the framework of this research.

APPENDIX 2 FOOD SECURITY INDEX DETERMINANTS, REGRESSION RESULTS

	FSI_1		FSI_2		FSI_3	
	coef/se	Beta	coef/se	beta	coef/se	beta
	coef/se	Beta	coef/se	beta	coef/se	beta
SCI_t	0.085**	0.092	0.095**	0.102	0.098**	0.105
	(0.041)		(0.040)		(0.041)	
Death	-0.368**	-0.070	-0.289*	-0.055	-0.406***	-0.078
	(0.160)		(0.160)		(0.157)	
Ins_2	0.060***	0.122	0.053**	0.108	0.069***	0.140
	(0.021)		(0.021)		(0.021)	
Ins_3	0.098***	0.236	0.091***	0.219	0.101***	0.242
	(0.021)		(0.021)		(0.021)	
Ins_4	0.113***	0.278	0.105***	0.258	0.116***	0.286
	(0.023)		(0.023)		(0.023)	
Ins_5	0.109***	0.166	0.106***	0.161	0.115***	0.175
	(0.027)		(0.027)		(0.027)	
Ve_2	-0.036*	-0.095	-0.034*	-0.090	-0.037*	-0.098
	(0.021)		(0.021)		(0.021)	
Ve_3	-0.089***	-0.211	-0.089***	-0.213	-0.090***	-0.214
	(0.023)		(0.023)		(0.023)	
Ve_4	-0.142***	-0.224	-0.133***	-0.210	-0.149***	-0.235
	(0.028)		(0.027)		(0.027)	
Ve_5	-0.252***	-0.294	-0.232***	-0.271	-0.252***	-0.294
	(0.033)		(0.033)		(0.033)	
H	0.132***	0.148	0.129***	0.145	0.158***	0.177
	(0.034)		(0.034)		(0.035)	
Tot_dep	-0.093***	-0.099				
	(0.036)					

Int_dep	-0.202***		-0.155			
	(0.048)					
ldp			0.071***		0.083	
			(0.028)			
Aleppo	-0.062***	-0.132	-0.055**	-0.116	-0.067***	-0.143
	(0.023)		(0.023)		(0.023)	
Rural Damascus	0.013	0.025	0.018	0.034	0.005	0.009
	(0.022)		(0.022)		(0.022)	
Homs	-0.006	-0.008	-0.003	-0.003	0.015	0.021
	(0.026)		(0.026)		(0.027)	
Hama	-0.034	-0.052	-0.033	-0.050	-0.024	-0.036
	(0.024)		(0.024)		(0.024)	
Latakia	0.010	0.013	0.006	0.008	0.029	0.039
	(0.027)		(0.027)		(0.027)	
Idleb	-0.034	-0.045	-0.027	-0.036	-0.044	-0.057
	(0.028)		(0.028)		(0.028)	
Al-Hassakeh	-0.174***	-0.222	-0.190***	-0.242	-0.156***	-0.198
	(0.029)		(0.029)		(0.029)	
Deir ez zor	-0.070**	-0.088	-0.060**	-0.075	-0.046	-0.058
	(0.029)		(0.029)		(0.029)	
Tartous	0.032	0.038	0.027	0.032	0.054*	0.063
	(0.029)		(0.029)		(0.029)	
Rakka	-0.044	-0.044	-0.053	-0.053	-0.026	-0.026
	(0.038)		(0.038)		(0.038)	
Daraa	0.043	0.044	0.029	0.030	0.019	0.019
	(0.033)		(0.032)		(0.032)	
Sweida	0.005	0.004	0.004	0.003	0.026	0.021
	(0.039)		(0.039)		(0.039)	
Qunietera	-0.126	-0.045	-0.117	-0.042	-0.136*	-0.049
	(0.077)		(0.077)		(0.077)	
_cons	0.507***		0.511***		0.438***	
	(0.044)		(0.043)		(0.043)	
Number of observations	662		662		663	
Adjusted R2	0.525		0.533		0.525	
Log-Likelihood	426.14		431.65		426.73	

note: *** p<0.01, ** p<0.05, * p<0.1



المركز
السياسات
السياسات Research