Economic Cooperation Organization
Regional Coordination Centre
for Food Security

Food and Agriculture
Organization of the
United Nations

Overview of Food Security in the Countries of the Economic Cooperation Organization 2019

Overview of Food Security in the Countries of the Economic Cooperation Organization 2019

Published by
the Food and Agriculture Organization of the United Nations
and
the Economic Cooperation Organization Regional Coordination Centre for Food Security

Ankara, 2022

Required citation:

FAO and ECORCCFS, 2022. *Overview of Food Security in the Countries of the Economic Cooperation Organization 2019*. Ankara.

ISBN

Cover photograph: ©FAO/Vyacheslav Oseledko

Table of Contents

Foreword

The Overview of Food Security in the Countries of the Economic Cooperation Organization (ECO) provides a comprehensive review of the current status of food security in the region, highlighting the characteristics of food security, trends, challenges and recommendations. The publication brings together the latest and reliable data to provide the most up-to-date food security overview of the ECO region. The completion of the publication will also provide a timely opportunity to update the Regional Food Security Programme of ECO which was developed in 2008.

The publication monitors the progress made towards achieving zero hunger goals, fully in line with the framework of the Sustainable Development Goals (SDGs). Specifically, it monitors the progress towards the targets of ending hunger (SDG Target 2.1) and all forms of malnutrition (SDG Target 2.2). Since there are diverse pathways towards these targets, the status of various dimensions of food security is analysed in the publication, including agricultural production, economic access to food and the stability of food security.

Food security bolsters not only agricultural production but also people's lives and the futures of their societies. Guaranteed access to nutritious food results in higher labour productivity, greater mental capacity and healthier lives. Together, food security and good nutrition lay the foundation for achieving many of the SDG targets, while investment in food security drives the changes needed for a more prosperous future.

This first edition of the publication is the fruit of efforts made by the Economic Cooperation Organization Regional Coordination Centre for Food Security (ECO-RCC) in collecting and analysing relevant data and indicators. The Food and Agricultural Organization of the United Nations (FAO) provided technical support under the project "ECO Regional Coordination Centre for Food Security", which aimed to enhance knowledge sharing and cooperation among ECO member states in the area of food security. The project was financed by the Government of Turkey through the FAO Turkey Partnership Programme on Food and Agriculture (FTPP). We hope that our partnership will contribute to a more comprehensive understanding of the state of food security in ECO member states and to greater collaboration to achieve food security for all people in the region.

We further hope that the analysis, findings and suggestions in the publication will help encourage dialogue among ECO member states to develop a new effective regional programme for food security.

Aylin Çağlayan Özcan

Coordinator for Economic Cooperation Organization Regional Coordination Center for Food Security (ECO-RCC)

Viorel Gutu

Sub-Regional Coordinator for Central Asia Food and Agriculture Organization of the United Nations (FAO)

Acknowledgements

ECO-RCC wishes to acknowledge significant contributions to the development of the report, in particular that of Dr Tugrul Temel, International Consultant of the FAO Sub-regional Office for Central Asia, who prepared the draft report in close collaboration with Mr Keigo Obara, FAO Food Security Officer and Lead Technical Officer of the project "Economic Cooperation Organization Regional Coordination Centre for Food Security", supported by the FAO-Turkey Partnership Programme (FTPP). The report was made possible by the contributions of a team of experts from the ECO-RCC, including Mr Volkan Güngören, Ms Özlem Hiçcan and Ms Burcu Serin. Special thanks are owed to the ECO-RCC focal points in Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyz Republic, Pakistan, Tajikistan, Turkey and Uzbekistan, who participated in the Third Steering Committee Meeting of the ECO-RCC in March 2019 in Antalya, Turkey, and provided valuable inputs to the findings of the report.

PART 1

Part 1. The concept of food security and nutrition and related goals

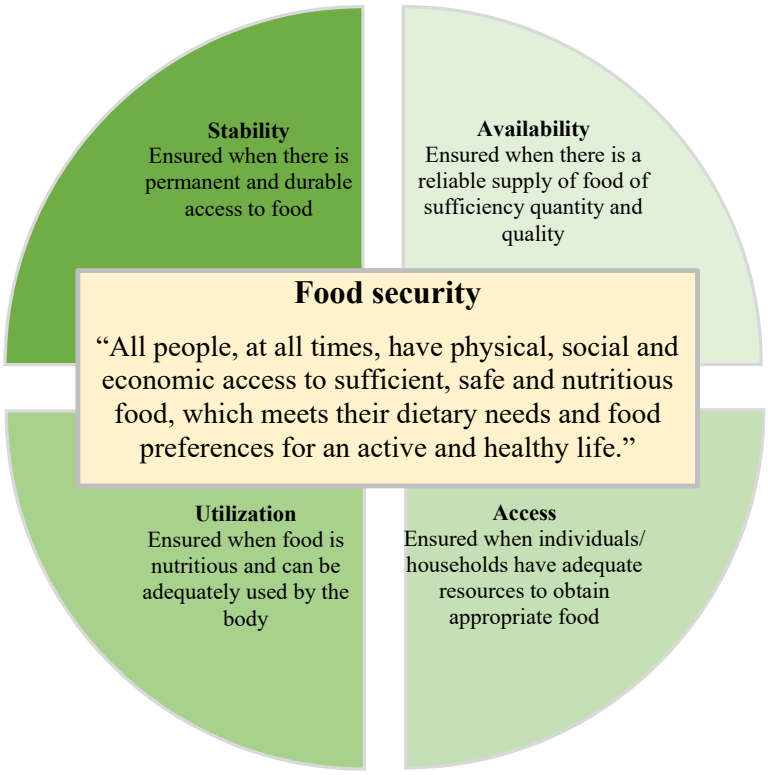
1.1 The concept of food security

Definition of food security

The Rome Declaration on World Food Security (1996) defines food security as the condition that "all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food, which meets their dietary needs and food preferences for an active and healthy life." For a food secure situation to be established, four conditions need to be satisfied simultaneously. First, food needs to be *available* for consumption; second, people should have the means to *access* food; third, food needs to be consumed in a healthy consumption environment in order for people to fully *utilize* the nutrients it contains; and fourth, all the processes involved should be *stable* for a foreseeable period of time.

These four conditions constitute the foundation for diverse pathways to food security. *Food availability* concerns the availability of sufficient food of appropriate quality, supplied through domestic production, imports and food aid. *Food access* involves individuals' physical, social and economic access to adequate food through the income and entitlements necessary to acquire appropriate food for a nutritious diet. *Food utilization* relates to the utilization of food through adequate diet, clean water, sanitation and health care to attain a state of nutritional well-being where all physiological needs are met. The environment in which food is consumed plays a critical role in the absorption of nutrients. *Stability* refers to the continuity and sustainability of all optimal pathways leading to a food secure situation for all people, at all times. People should not risk losing access to food as a consequence of economic, social and natural shocks or cyclical events.

Figure 1. The four dimensions of food security



Indicators to measure and monitor food security

A food (in)secure situation can be characterized by multiple factors, including domestic production, trade, aid, market structure/conduct, income distribution, public/individual health and the ability of a society/community to cope with shocks. Various indicators have been developed to measure the degree of food (in)security on the one hand and monitor food security situation on the other. A broad agreement has been reached on the indicators given in Table 1.

Table 1. The suite of food security indicators

FOOD SECURITY INDICATORS	DIMENSION	
Average dietary energy supply adequacy Average value of food production Share of dietary energy supply derived from cereals, roots and tubers Average protein supply Average supply of protein of animal origin	AVAILABILITY	STATIC and DYNAMIC DETERMINANTS
Percentage of paved roads over total roads Road density Rail lines density	PHYSICAL ACCESS	
Domestic food price index	ECONOMIC ACCESS	
Access to improved water sources Access to improved sanitation facilities	UTILIZATION	
Cereal import dependency ratio Percentage of arable land equipped for irrigation Value of food imports over total merchandise exports	VULNERABILITY	
Political stability and absence of violence/terrorism Domestic food price volatility Per capita food production variability Per capita food supply variability	SHOCKS	
Prevalence of undernourishment Share of food expenditure of the poor Depth of the food deficit Prevalence of food inadequacy	ACCESS	OUTCOMES
Percentage of children under 5 years of age affected by wasting Percentage of children under 5 years of age who are stunted Percentage of children under 5 years of age who are underweight Percentage of adults who are underweight Prevalence of anaemia among pregnant women Prevalence of anaemia among children under 5 years of age Prevalence of vitamin A deficiency (forthcoming) Prevalence of iodine deficiency (forthcoming)	UTILIZATION	

Note: Values and detailed descriptions and metadata for these indicators are available on the companion website (www.fao.org/publications/sofi/en/).
Source: FAO.

Source: FAO (2013a: 16).

1.2 Linkages between food security and nutrition

Forms of malnutrition

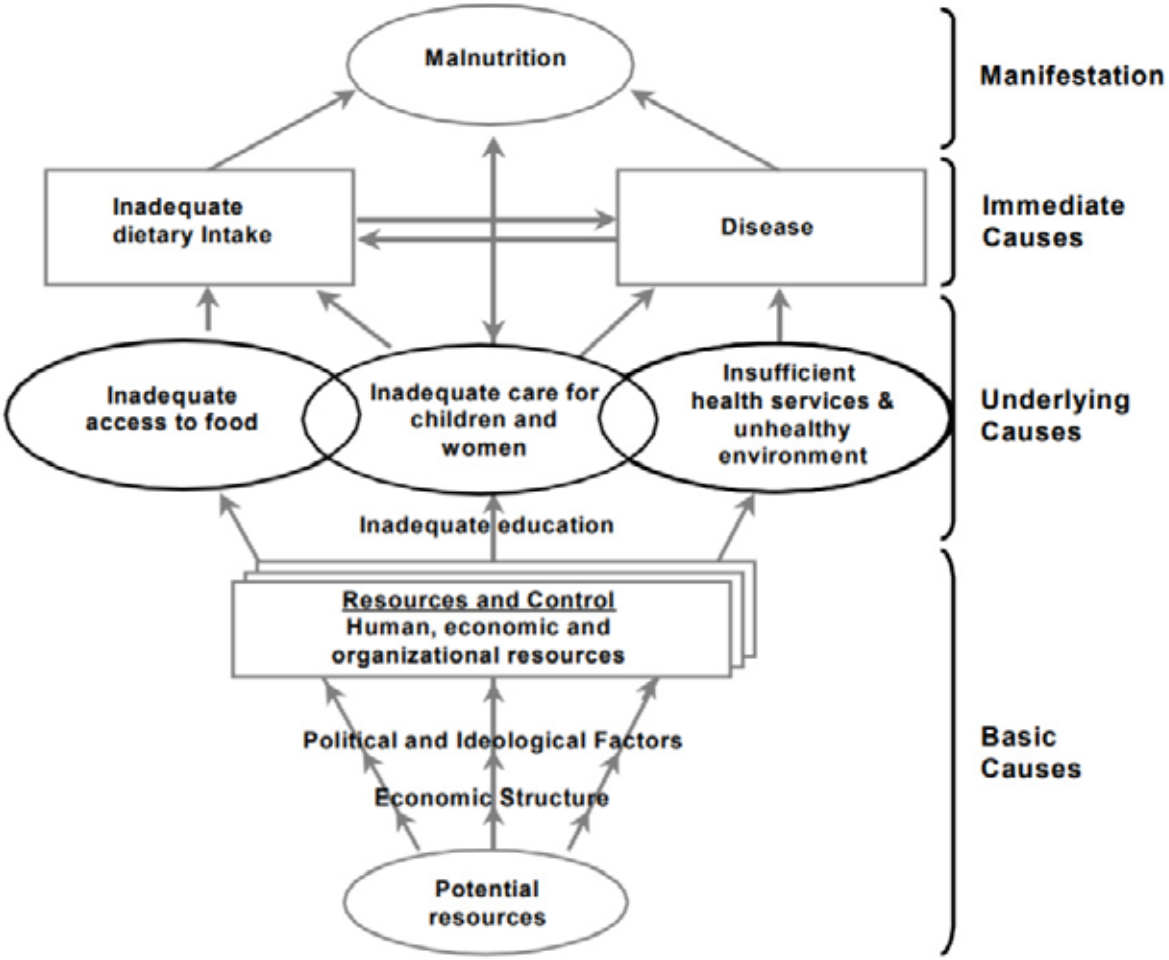
Malnutrition refers to deficiencies and excesses in a person's intake of energy and/or nutrients. It is expressed in three broad forms. *Undernutrition* is an outcome of poor nutritional intake in terms of quantity and/or quality, and/or poor absorption and/or poor biological use of nutrients consumed as a result of repeated disease. It includes wasting (low weight for height), stunting (low height for age) and underweight (low weight for age) among children under five years of age. *Micronutrient deficiency* refers to insufficient consumption of food and/or poor utilization of key vitamins and

minerals (iodine, vitamin A and iron among others). It represents a major threat to the health and development of a person in general and of children and pregnant women in particular. *Overnutrition* – micronutrient excess – relates to excess consumption of food and nutrients and creates conditions for overweight and obesity. Consuming foods and drinks that are more energy-dense (i.e. high in sugars and fats) and engaging in less physical activity are associated with overweight and obesity, which increases the risk of cardiovascular disease, hypertension, cancer and type 2 diabetes.

Causes of malnutrition

Malnutrition is a complex condition that results from the interaction of multiple factors, including lack of sufficient food of adequate nutrients, poverty, diseases, lack of safe public health conditions, conflicts and climate change among others. Escaping from malnutrition requires sufficient food production for human survival, adequate income to access food, a safe and hygiene food consumption environment for the effective utilization of food, a peaceful environment that allows people to be productive and earn income from their livelihoods, and the ability for people and communities to cope with the shocks and negative effects of climate change. The conceptual framework of nutrition (Figure 2) illustrates these multifactorial determinants of malnutrition.

Figure 2. The conceptual framework of nutrition



Source: UNICEF (1990).

Poverty heightens the risk of and risks from malnutrition.

Poor people are more likely to experience different forms of malnutrition, as poverty seriously affects their access to adequate amounts of nutritious food. In the absence of sufficient resources, unexpected rises in food prices worsen access to food for vulnerable and poverty-stricken people. Restricted physical access to markets due to lack of or poor transportation infrastructure can lead to food insecurity among vulnerable populations, increasing the risk of malnutrition. Agricultural growth is essential to create not only employment for rural populations but also resources for the development of rural public health infrastructure, but is impacted adversely by plant and animal diseases, droughts, climate change, poor governance of natural resources and commons, technology gaps and demographic changes. Safe drinking water and sanitation and improved hygiene practices would reduce vulnerability to infectious and water-borne diseases, which are among the direct causes of acute malnutrition.

Conflicts and natural disasters are associated with food insecurity.

Conflicts have a direct impact on food insecurity, drastically compromising access to food. As violence escalates, people are often forced to flee and lose access to their means of food production and markets, rendering them unable to produce and obtain sufficient food for their living. Natural disasters linked to climate change, such as droughts and floods, devastate the livelihoods of already vulnerable populations by negatively impacting agricultural production, while creating an environment in which diseases can spread quickly. A large number of studies in the literature demonstrate that declines in agricultural production caused either directly or indirectly by climate change could dramatically increase the number of food insecure people in the coming years.

Effects of malnutrition

Malnutrition can result in socio-economic loses associated with malnutrition-related outcomes in myriad ways. Malnutrition, in all its forms, limits people's opportunity to live healthy and productive lives, increasing health costs and reducing productivity, which can perpetuate a cycle of poverty and ill health. The socio-economic impact of malnutrition can be enormous taking into account the effect on economic growth and lost investments in human capital associated with preventable child deaths, as well as premature adult mortality linked to diet-related non-communicable diseases. FAO calculated that an annual investment of USD 1.2 billion to improve the micronutrient supply globally through supplementation, food fortification and/or biofortification of staple crops would result in "better health, fewer deaths and increased future earnings" of up to USD 15.3 billion per year (FAO, 2013b; FAO-EU, 2017). Research provides evidence that investing in agriculture reduces malnutrition (the prevalence of stunting), and transforms the agricultural sector into an engine driving the recovery of overall economic losses due to malnutrition.

1.3 Food security and nutrition in the Sustainable Development Goals

SDG targets related to food security and nutrition

Food security and nutrition are central to the United Nations 2030 Agenda for Sustainable Development, which consists of 17 Sustainable Development Goals (SDGs) to end poverty and other forms of deprivation by improving health and education, reducing inequality and spurring economic growth, while tackling climate change and working to preserve the oceans and forests.

Food security and nutrition targets are unified under a single Sustainable Development Goal (SDG) 2

(see Table 2), which calls on countries to "end hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030." SDG 2 incorporates eight closely related targets, which are closely related to one another. For instance, in contexts where many of the food insecure depend on agriculture for a living, improvements in agricultural productivity and the incomes of small-scale food producers (Target 2.3) will act as a vehicle to improve access to food (Target 2.1). Making agriculture more resilient and sustainable (Target 2.4) will in turn strongly influence the future availability and stability of food supplies (Targets 2.3 and 2.4). Together, improvements towards Targets 2.3, 2.4 and 2.1 will underpin progress towards Target 2.2, which aims to "end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons". Monitoring progress towards SDG 2 targets therefore goes beyond the simple tracking of SDG 2 indicators; it requires an improved understanding of the causal interactions among the determinants of SDG 2 targets.

Table 2. Targets and indicators of food security and nutrition-related SDGs

SDG 2 Targets		**SDG 2 Indicators**	
2.1	By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.	2.1.1	Prevalence of undernourishment
		2.1.2	Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)
2.2	By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.	2.2.1	Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age
		2.2.2	Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)
2.3	By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.	2.3.1	Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size
		2.3.2	Average income of small-scale food producers, by sex and indigenous status
2.4	By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.	2.4.1	Proportion of agricultural area under productive and sustainable agriculture

2.5	By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.	2.5.1	Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities
		2.5.2	Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction
2.A	Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.	2.A.1	The agriculture orientation index for government expenditures
		2.A.2	Total official flows (official development assistance plus other official flows) to the agriculture sector
2.B	Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round.	2.B.1	Producer Support Estimate
		2.B.2	Agricultural export subsidies
2.C	Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.	2.C.1	Indicator of food price anomalies

Interactions between SDG 2 and other SDGs

All SDGs interact with one another – by design they constitute an integrated set of global objectives that are fundamentally interdependent. Understanding the nature of positive ("co-benefits") and negative ("trade-offs") interactions among SDGs is key to unlocking their full potential, as well as to ensuring that progress made in some areas is not made at the expense of progress in others. SDG 2 in itself represents a compelling case for recognizing and governing interactions between SDGs. For example, a context-specific assessment is required to determine how intensifying agricultural production may affect the environment, including through the expansion of pathogen habitats and the degradation of waterways, as these may have negative impacts on human health, economic growth and food security. SDG 2 frames such linkages in the context of eradicating malnutrition through growth in sustainable agricultural production (Figure 3).

Figure 3. Linkages between agriculture and the 17 SDGs

Source: FAO (2016c).

It is widely understood that SDG 2 connects to every SDG in some way. For example, improvements in nutrition contribute to the achievement of healthy lives (SDG 3), while increased income for farmers contributes to ending poverty (SDG 1), improving gender equality (SDG 5), promoting economic growth (SDG 8) and reducing inequalities (SDG 10). SDG 2 is a strong enabler for SDG 1, as increasing agricultural production, productivity and incomes improves access to food for poor and vulnerable communities. These linkages are dynamic and incorporate feedback loops to SDG 2. For example, reduced inequality (SDG 10) reduces food insecurity through improved access to food. Improved diet quality is directly linked to SDG 2 and also supports poverty reduction (SDG 1), health and well-being (SDG 3), cognitive development and learning (SDG 4), reduced inequality (SDG 5 and SDG 10) and improved work and productivity (SDG 8).

Achieving the targets related to access to food, quality nutrition for all and agricultural incomes (SDG 2) will provide key enabling conditions for the empowerment of women and gender equality (SDG 5), by opening up development opportunities for women. Conversely, gender equality and enhancing women's rights (SDG 5) can help achieve the targets related to sustainable, increased food production and nutrition, and can enhance the role of women in agriculture (SDG 2).

Health and well-being (SDG 3) cannot be achieved without access to a sufficient quantity and quality of food (SDG 2). How the SDG 2 targets related to increasing agricultural production and productivity are implemented will have a major influence on soil and water quality, land use, and ecosystem health and functioning. If not properly managed, growth in agricultural productivity could harm health through, for example, damage to ecosystems and a rise in pathogen habitats. Achieving SDG 3 supports SDG 2 because a healthy population is essential for achieving nutrition and agricultural production targets.

Healthy ecosystems (SDG 15) provide vital services ranging from soil and water quality to genetic diversity and pollination. Agriculture is a key driver impacting ecosystems, therefore sustainable agricultural systems and practices (SDG 2) contribute to ecosystem health. However, increased agricultural production and productivity, if not sustainable, can result in deforestation and land degradation, jeopardizing long-term food security. A careful balance is needed between achieving food for all (SDG 2) and conserving and restoring ecosystems (SDG 15). The list of interactions between SDG 2 and other SDGs can be extended at will.[1]

Box 1. Food self-sufficiency and food security

The concepts of food self-sufficiency and food security differ in several respects. The former considers national production as the only source of food supply, while the latter takes into account food imports and aid. In addition, the former concerns the availability at the national level of domestically produced food only, while the latter addresses the stability of food supply, access and consumption by the population.

The concept of food self-sufficiency is generally understood as the extent to which a country can satisfy its food needs from its own domestic production. Until the 1980s, food security policies in many countries focused on self-sufficiency of staple food. Such a focus can be seen in the context of food shortages in the early and mid-twentieth century caused by the disruption of agricultural production and international trade during and after the Second World War. Some assert that the best way to increase a country's food security level is to increase its level of self-sufficiency in regard to staple food, on the grounds that a country may have more control over its food supply if it is not dependent on international markets.

However, self-sufficiency in staple food may not advance food security. The national staple self-sufficiency rate can increase not only through growth in production but also as a result of stagnant consumption levels caused by low population purchasing power (poverty). For example, India has achieved self-sufficiency in wheat and rice, but malnutrition remains widespread.

Source: FAO (2016d).

PART 2

Part 2. Overview of four dimensions of food security and nutrition in ECO countries

2.1 Progress towards SDG undernourishment targets (SDG 2.1)[1]

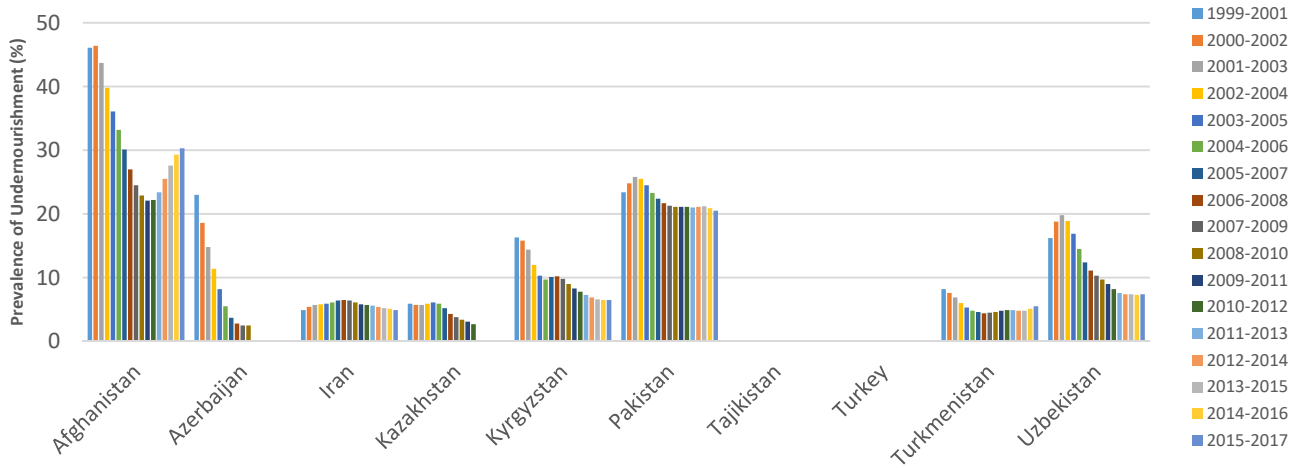
Evolution of food security in ECO

SDG Target 2.1 aims to "end hunger by 2030 and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round". The evolution of progress towards zero hunger is monitored through the use of two SDG indicators (2.1.1 and 2.1.2). Indicator 2.1.1 measures the prevalence of undernourishment (PoU), defined as the proportion of undernourished people relative to total population. It approximates the degree of inadequacy of energy intake of a person in relation to the required energy intake.

The ECO region significantly reduced the prevalence of undernourishment during 1999-2017; however, recent years show an overall stagnation in almost all ECO countries.

Figure 4 shows that all Economic Cooperation Organization (ECO) countries successfully reduced the PoU over the period 1997–2017. In more recent years, however, almost all ECO countries exhibit stagnation in the reduction of the PoU, except for Afghanistan where the PoU increased from 22 percent in 2008 to 30 percent in 2017. Ensuring economic access to food for all vulnerable groups is challenging, especially for countries facing a rising influx of refugees such as Pakistan and Turkey. It is estimated that 59 million people are still suffering from undernourishment in the ECO region.

Figure 4. Prevalence of undernourishment (PoU, %) (SDG Indicator 2.1.1)

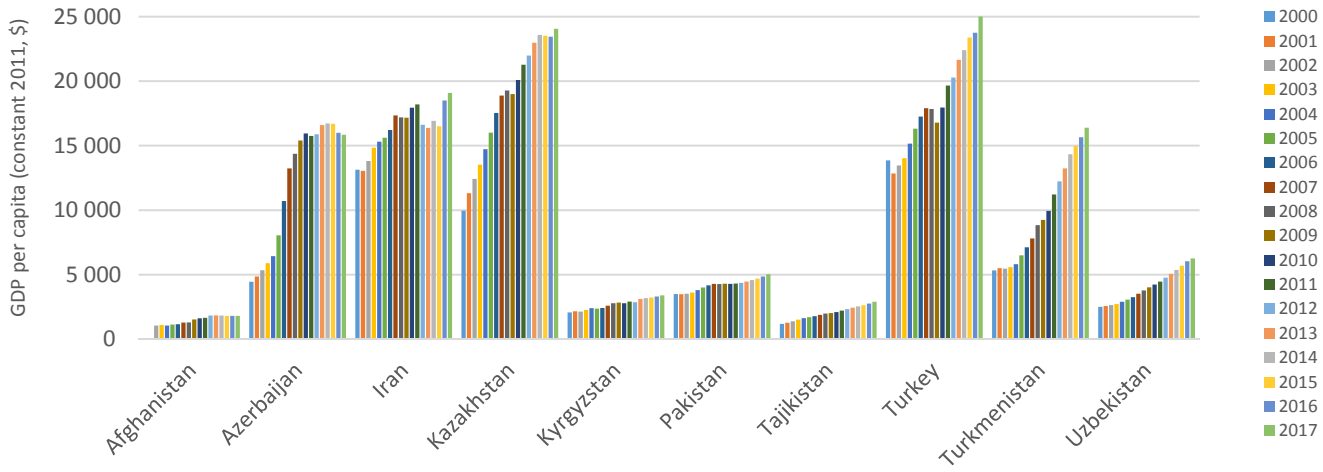


Cross-country differences with respect to changes in the PoU reflect to some extent sub-regional differences in terms of economic growth, natural resources for food production, infrastructure, the macroeconomic and sectoral policy environments, institutional stability, and the internal peace and security situation. Countries in Central Asia, Azerbaijan and Turkey, with economic growth and policies to improve agricultural productivity, performed better than the other three countries, where performance was adversely affected by poor infrastructure, war and conflicts in some areas. High per capita GDP growth in Azerbaijan, Kazakhstan, Turkey and Turkmenistan, medium growth in Iran and Uzbekistan, and low growth in others may account for part of the progress made in the reduction

of undernourishment (Figure 5). The current development gaps across countries point to the need for effective governance of actions to consolidate progress and eradicate undernourishment in the region.

Country-level trends in the reduction of undernourishment suggest that policies should firmly promote broad-based agricultural and rural development to prevent the upsurge of undernourishment, especially in countries faced with frequent conflicts and high population growth.

Figure 5. Gross domestic product per capita (in purchasing power equivalent, constant 2011, USD)

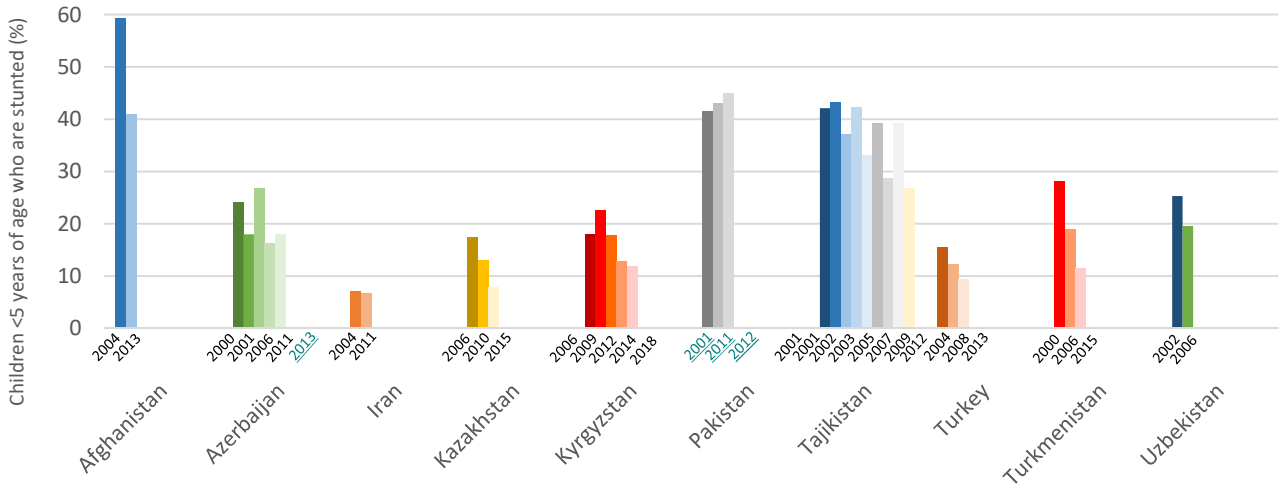


Evolution of the nutrition situation in the ECO region (SDG 2.2)

SDG Target 2.2 calls for an end by 2030 to "all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons". Three nutrition indicators summarize the dynamics of malnutrition in the ECO region with respect to global nutrition targets.

SDG Target 2.2 also aims to reduce the prevalence of stunting by 40 percent by 2025. It is important to assess trends in both relative and absolute terms owing to the effects of population growth, which may manifest as an increase in the number of stunted children may increase, while the prevalence of stunting decreases. During the period 2000–2015, most countries in the ECO region achieved significant reductions in stunting (Figure 6). A comparison of data for 2015 with 2000 shows that nine out of 10 countries reduced stunting, while Pakistan experienced a continuous increase from 41.5 percent in 2000 to 45 percent in 2015. Data for the period 2011–2013 further show that stunting in Azerbaijan is also rising. Although progress is the dominant pattern in the region, it should not be taken as representative of the actual situation, as high rates of population growth in the region, especially in Afghanistan, Iran and Turkey, may distort the trend.

Figure 6. Children <5 years of age who are stunted (%) (SDG 2.2)



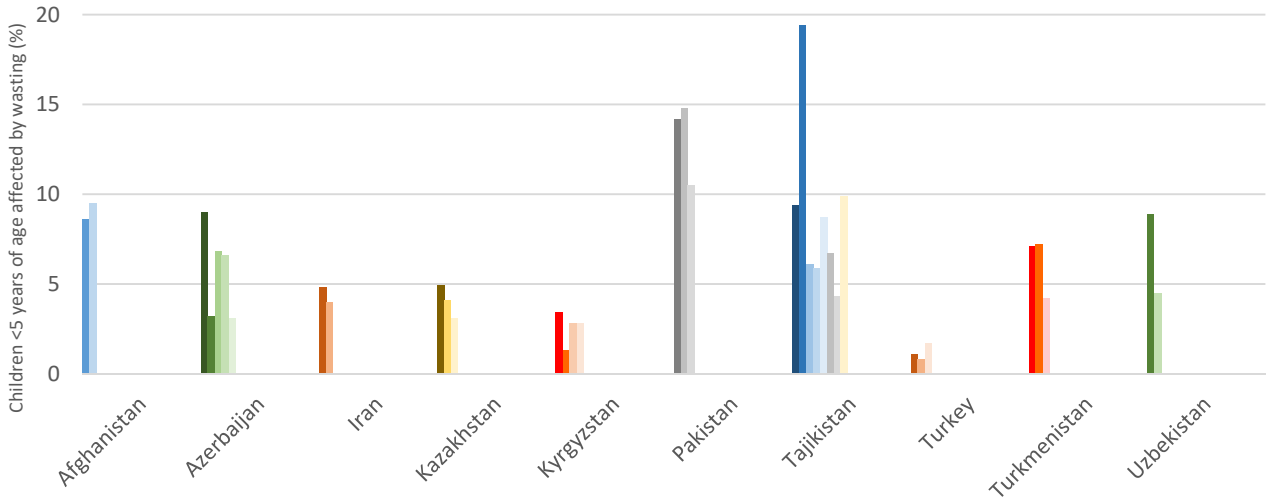
Achieving the target of a 40 percent reduction by 2025 is especially challenging for four countries in the region, calling for significant investment in agriculture, health-based nutrition and education.

The prevalence of stunting is currently highest in Afghanistan, Pakistan and Tajikistan, where more than 25 percent of children aged under five are too short for their age. The situation in Azerbaijan is also critical with the proportion reaching 18 percent in 2013. These four countries are followed by Uzbekistan, Kyrgyzstan, Turkmenistan and Turkey where the prevalence of stunting ranges from 10 to 20 percent. The lowest rate occurs in Iran with about 7 percent observed in 2011. Most recently available data after 2010 show that only three countries in the ECO region have a prevalence of less than 10 percent, including Iran, Kazakhstan and Turkey. Preventive actions exist, including ensuring that pregnant and lactating mothers are adequately nourished, that infants receive exclusive breastfeeding during the first six months of life, and that complementary foods are available in adequate quantities and quality for children aged 6–23 months. Focusing nutrition interventions on the 1 000 days of life and improving the quality of health care services would reduce stunting.

Most countries in the ECO region have already achieved the target for the prevalence of wasting.

Wasting (being too thin for height) among children under five is of critical importance due to the heightened risk of disease and death. The global nutrition target is to reduce childhood wasting to below 5 percent by 2025. Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Turkey, Turkmenistan and Uzbekistan reached the wasting target, while the situation in Afghanistan, Pakistan and Tajikistan warrants heightened attention to address the prevalence of wasting, which is currently about 9–11 percent (Figure 7).

Figure 7. Children <5 years of age affected by wasting (%) (SDG 2.2)



The prevalence of overweight increased in five and decreased in two countries during the period 2000–2015.

Overweight (being too heavy for height) among children under five years of age reflects a chronic process of excessive weight gain, increasing the risk of developing serious health problems, as well as the risk of obesity, diet-related non-communicable diseases, premature death and disability in adulthood. Five countries (Afghanistan, Azerbaijan, Turkey, Turkmenistan and Uzbekistan) show an increasing trend, two (Kazakhstan and Kyrgyzstan) a decreasing one, while two others (Pakistan and Tajikistan) show no change in the trend. The prevalence is especially high in Azerbaijan and Turkey, as opposed to a continuous reduction accomplished in Kazakhstan and Kyrgyzstan at 46 and 36 percent, respectively. Overall, the ECO region has not achieved the success it could despite the growth in the population of children. This regional trend points to the need to implement cross-sector interventions in agriculture, nutrition, health care and education, and to increase awareness of the linkages between food consumption, diet quality and health problems, in order to achieve the target by 2025.

The ECO region has substantially reduced undernourishment over time, but malnutrition remains a key challenge, especially in countries that have achieved significant reductions in undernourishment. The nature of the problem calls for policy interventions based on the food systems approach.

Policy interventions exist to ensure access to sufficient nutrients for all. Nutrition interventions such as food fortification (e.g. wheat flour fortification) and dietary diversity are viable options to enhance nutrition security. Agricultural interventions also exist, such as investment in agricultural R&D to promote the production of more nutritious food through the development of new breeding techniques (crop biofortification). These can make a major difference to micronutrient intakes in highly deficient areas in the ECO region, where dominant wheat-focused diets account for more than 50 percent of dietary energy. Increasing food diversity in diets is another way for food policies to improve food and nutrition security. More diverse diets reduce micronutrient malnutrition and hence lead to better nutrition outcomes.

All these interventions are designed from a single sector perspective, however the issues involved have multiple causes originating from numerous sectors. This underlines the need for an integrated

cross-sector perspective. The food systems approach opens up an avenue to develop cross-sector policy interventions to achieve long-lasting improvements in food and nutrition security. From the food systems perspective, food insecurity and malnutrition are systems failures that can be successfully addressed only if interventions are designed based on the interactions of the agriculture, environment, health and nutrition components of the food system.

Vostochnyi, Kyrgyz Republic - A Family dinner in the village of Vostochnyi

2.1 Food availability

Food availability at the national level has improved significantly.

The amount of available food measured in terms of calories per day per person has significantly increased in the ECO region. Improvement in the Dietary Energy Supply (DES) has been achieved in spite of population growth, especially in Iran, Pakistan and Turkey (Figures 8 (a, b)). Although the DES has increased across the region, differences exist across countries with respect to the levels achieved during 2015–2017, as well as the trends since 1999–2001. Afghanistan has a DES level of 2 000 calories (per day/per person) following a decline from 2 100 calories in 2010–2012. Likewise, Turkmenistan achieved 2 750 calories, following a decline starting in 2007–2009. The situation in Pakistan has remained almost unchanged since 2010–2012 with a DES level of 2 432. Turkey, Kazakhstan, Azerbaijan and Iran achieved a level above 3 000 calories, with a substantial increase in the trend in Azerbaijan, Kazakhstan and Uzbekistan. Regional progress in food availability has been recorded in spite of increasing populations in ECO countries.

Figure 8(a). Dietary Energy Supply (DES) (kcal/caput/day)

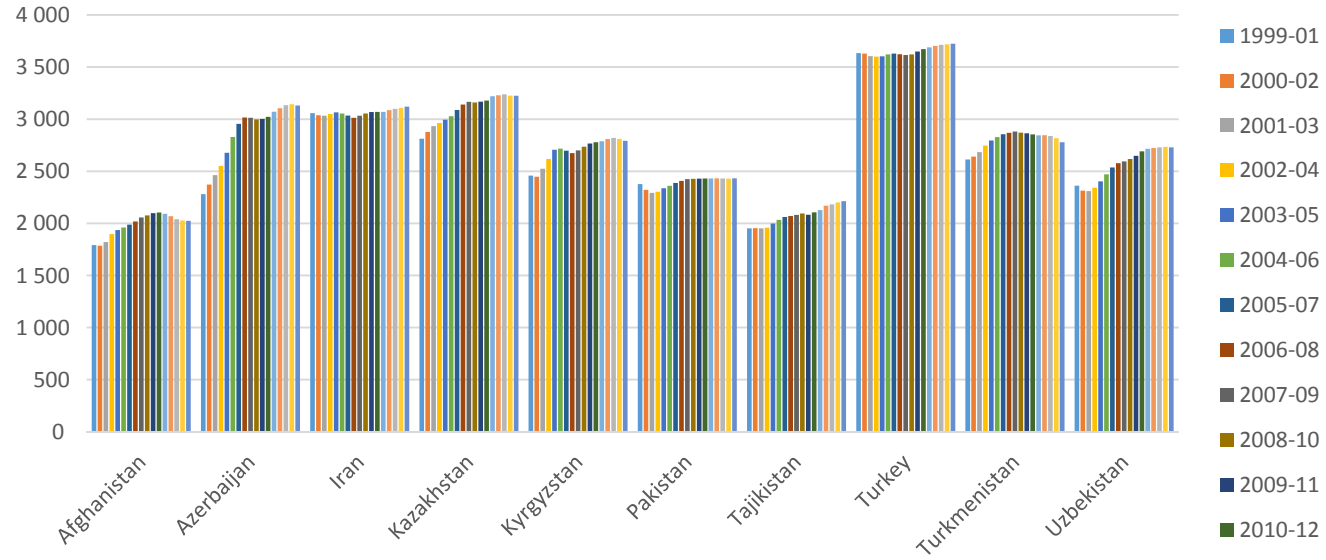
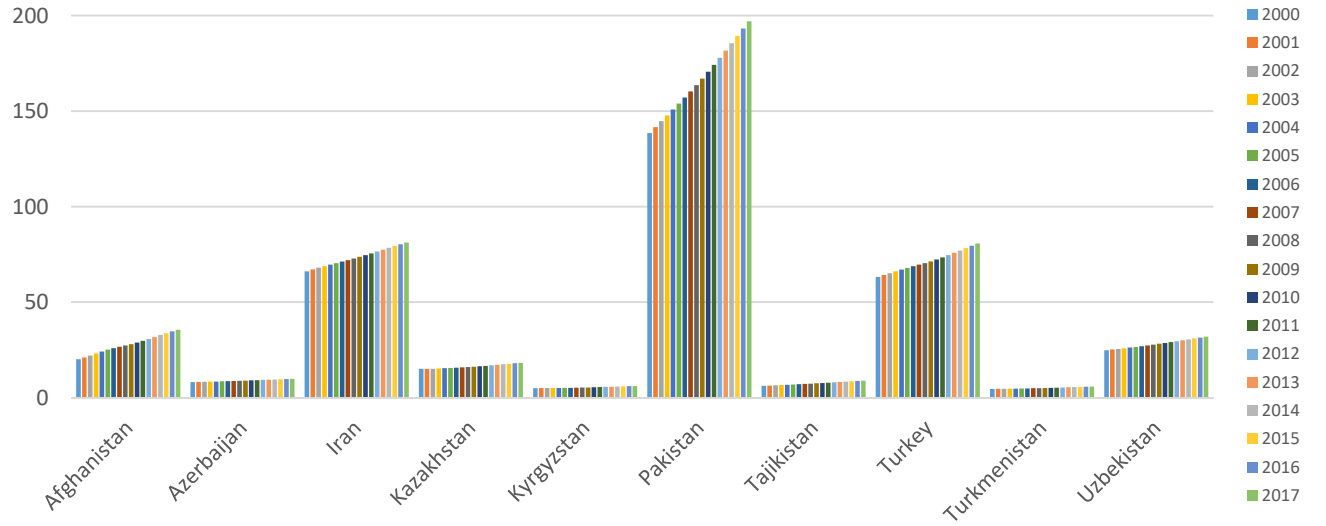


Figure 8(b). Total population (millions)

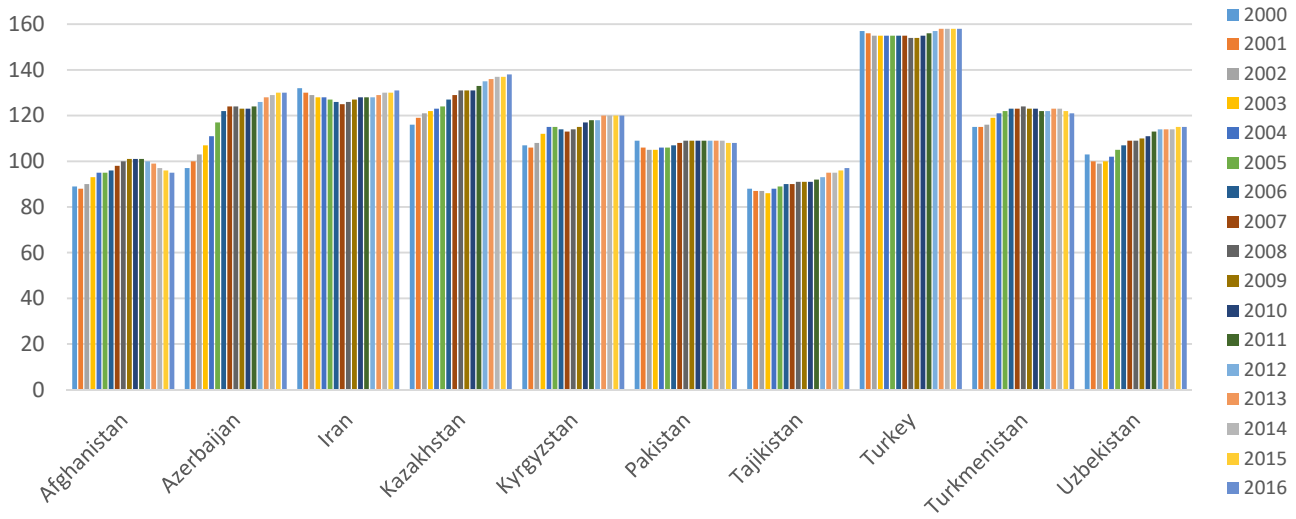


Availability of food means that a sufficient amount of food of appropriate quality is physically available for consumption. It does not mean that people have access to food for actual consumption. The Average DES Adequacy (ADESA) indicator expresses the DES as a percentage of the Average Dietary Energy Requirement (ADER). When analysed together with the PoU, the ADESA can discern whether undernourishment is due mainly to insufficiency of food supply or to particularly bad distribution.

Figure 9 shows that the amount of available food in terms of calories has grown faster in ECO countries than population growth, resulting in rising per person food availability. Of 10 countries, only two (Afghanistan and Tajikistan) lack sufficient amounts of food to support the energy requirements of their populations, although Tajikistan has experienced continuous improvement since 2004. Other countries, led by Turkey and Kazakhstan, have more food than required for their people. The improvement is consistent with the reduction in the PoU over the same period, indicating that increased food supply contributed to a reduction in the prevalence of undernourishment. This

suggests that the prevailing undernourishment and malnutrition in ECO countries is not due to insufficient food availability.

Figure 9. Average dietary energy supply adequacy (%)

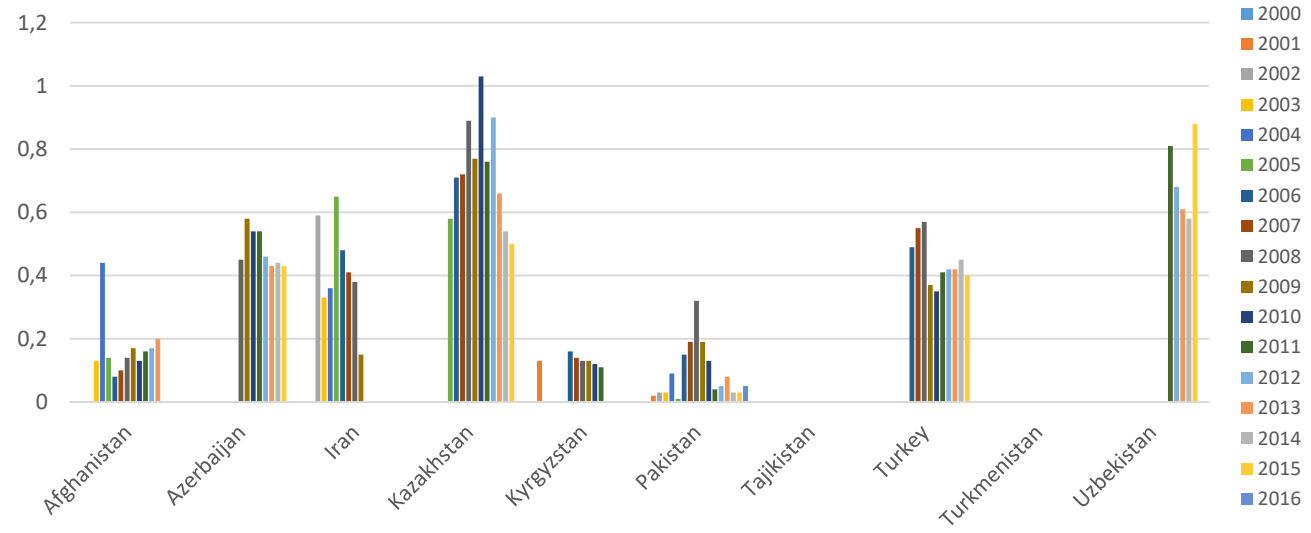


The Dietary Energy Supply (DES) Adequacy indicator is computed as the ratio of the total calories of food available in the country per capita, calculated from commodity balances, to the average dietary energy requirement. The indicator measures adequacy of the national food supply in terms of calories, and helps to determine whether undernourishment is due mainly to insufficient food supply or to poor distribution. An indicator of 100 means that dietary energy supply is equal to requirements. An indicator of less than 100 implies that supply in the country is inadequate to meet the population's needs.

Public support aimed to increase agriculture productivity has been limited across the region.

Increasing agricultural investment (SDG 2 Target 2.A) should enhance productive capacity if policies and policies that affect agricultural productivity support agricultural research and extension services, technology development, and plant and livestock gene banks. The agriculture orientation index, defined as the ratio of the share of government expenditures on agriculture to the sector's share of GDP (Figure 10), is a key SDG 2 indicator used to monitor investment in agriculture. The trend in the ECO region shows that agriculture has not received consistent attention from policy-makers, as indicated by cyclical movements in the index. However, there are differences across countries, with the most recent data revealing that Uzbekistan gives the highest support to agriculture (with a value of 0.9), followed by Kazakhstan (0.5), Azerbaijan and Turkey (0.4), while others have a value of 0.2 or below.

Figure 10. Agriculture orientation index for government expenditures



Food losses and wastes are high.

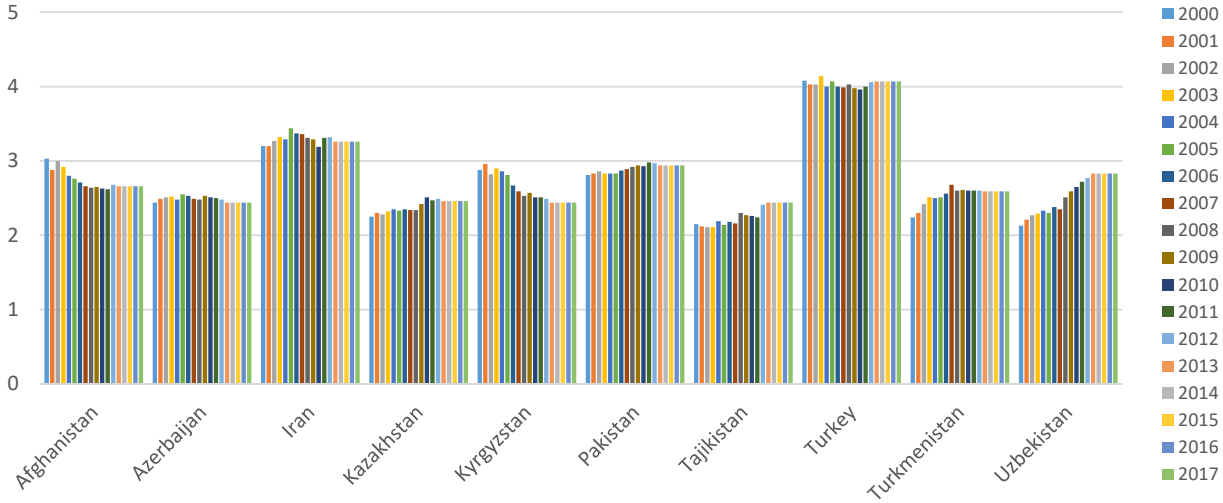
Bishkek, Kyrgyzstan - A waiter serves a cooked dish of fish from a local fish farm

Food losses and waste decrease food availability and reduce the income of farmers, thereby undermining food security. The underlying causes of food losses and waste vary depending on country-specific technological, economic and social factors, including farmers' access to post-harvest equipment and technologies, the state of transportation/storage/communication infrastructure, and

consumer eating habits and access to food storage technologies. The bulk of losses in middle and low-income countries of the region are observed at the agricultural production, post-harvest and storage stages of food supply chains.

SDG Target 12.3 aims to "halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses". Progress towards this target would also advance food security. Production losses and food waste in the ECO region indicate a non-uniform pattern in terms of the state of food supply chain development (Figure 11). With 4 percent, Turkey is leading in loss and waste measured in terms of incidence of caloric losses at retail distribution level, followed by Iran, Pakistan, Uzbekistan, Afghanistan and Turkmenistan (in the 2.5 to 3 percent range). Azerbaijan, Kazakhstan and Tajikistan perform better with an incidence of less than 2 percent. This regional trend, however, reflects country-specific differences in the incidence of loss. Interestingly, food losses and waste remained stable across the region between 2010–2017, implying the presence of structural problems across individual countries. Kazakhstan seems to be the most successful country in terms of loss and waste management, with incidence of food losses declining continuously over the period 2000–2017, while Uzbekistan shows a continuous increase during the same period.

Figure 11. Incidence (frequency) of caloric losses at retail distribution level (%)



The trends in cereal losses and waste (in tonnes) show that Turkey is leading with the highest losses incurred in cereals, followed by Iran, Pakistan, Kazakhstan and Afghanistan. The amounts of cereals lost indicate the potential for significant gains if post-harvest activities were organized more effectively. With respect to waste, the same trend is found in the same countries, where wastes are linked mostly to food retail food marketing and food-processing activities. A rough estimate indicates that cereal losses in the ECO region reached 29 661 000 tonnes during the period 2000–2013, an amount equivalent to sufficient food for an additional 3 125 500 people for each year.

Sources of energy supply are changing, with a substantial shift from calories from cereals to calories from protein, and a moderate increase in calories from fat.

A significant change has taken place in the composition of available DES calories over the period 2000–2017. The regional trend shows a sharp decline in the availability of calories from cereals/roots/tubers, while the availability of calories from protein increased substantially, alongside a moderate increase in the availability

of calories from fat. At the country level, the largest declines and the largest increases were observed in Kazakhstan and Turkey. Afghanistan and Tajikistan are likely to face large deficits of calories from fat, with about 77 percent and 58 percent of cereal calorie availability, respectively (see Figures 9 (a, b, c)).

If this pattern of change persists in the future and the proportional change in calorie composition is reflected in some way in actual food consumption, calorie consumption distribution in the ECO region will diverge from the optimal distribution for Asia, assuming the acquisition of 45–65 percent calorie from cereals, 16 percent from protein and 33 percent from fat. The current scale of change has important implications for food security and nutrition as changes would affect the burden of malnutrition in the region. Accordingly, agriculture, food and health/nutrition policies should consider the socio-economic impacts of regional changes in the optimal distribution of calories on the burden of malnutrition.

Figure 12(a). Dietary Energy Supply from cereals, roots and tubers (%)

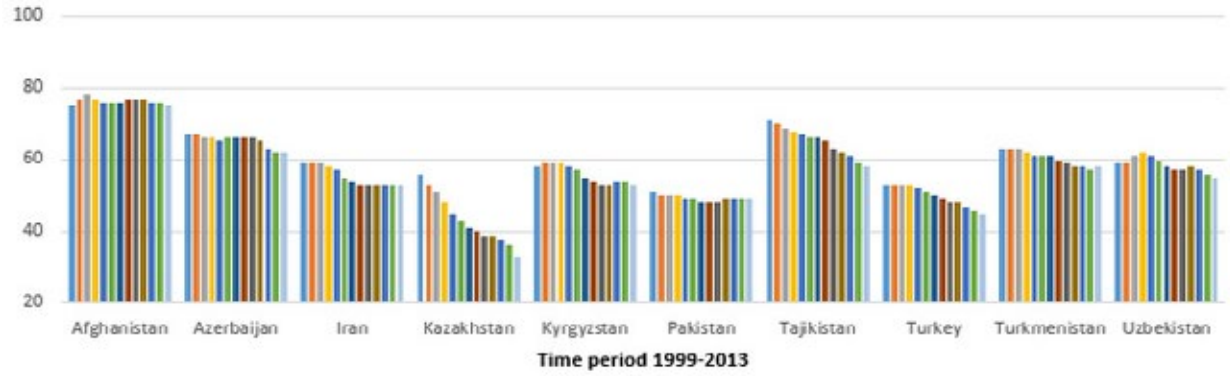


Figure 12(b). Average protein supply (gr/caput/day)

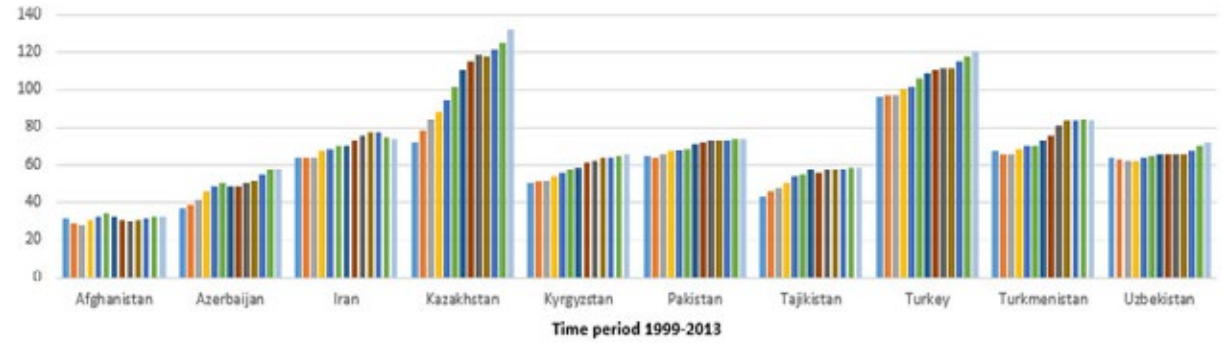
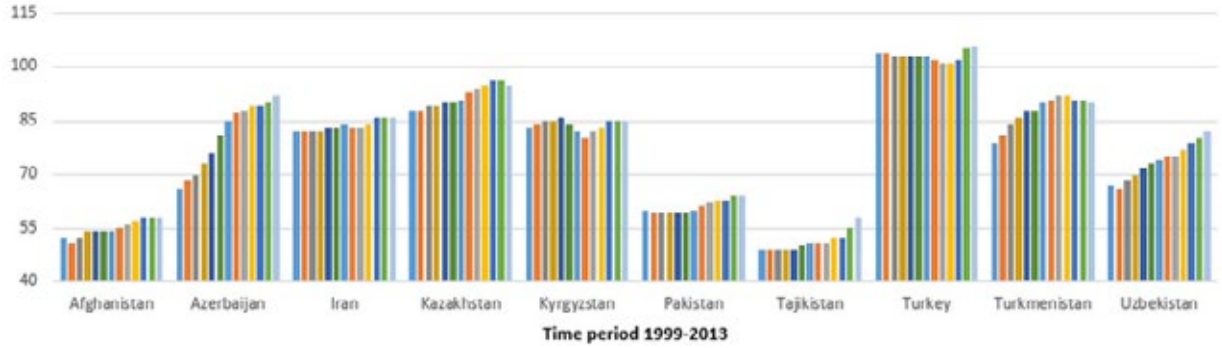


Figure 12(c). Average fat supply (gr/caput/day)



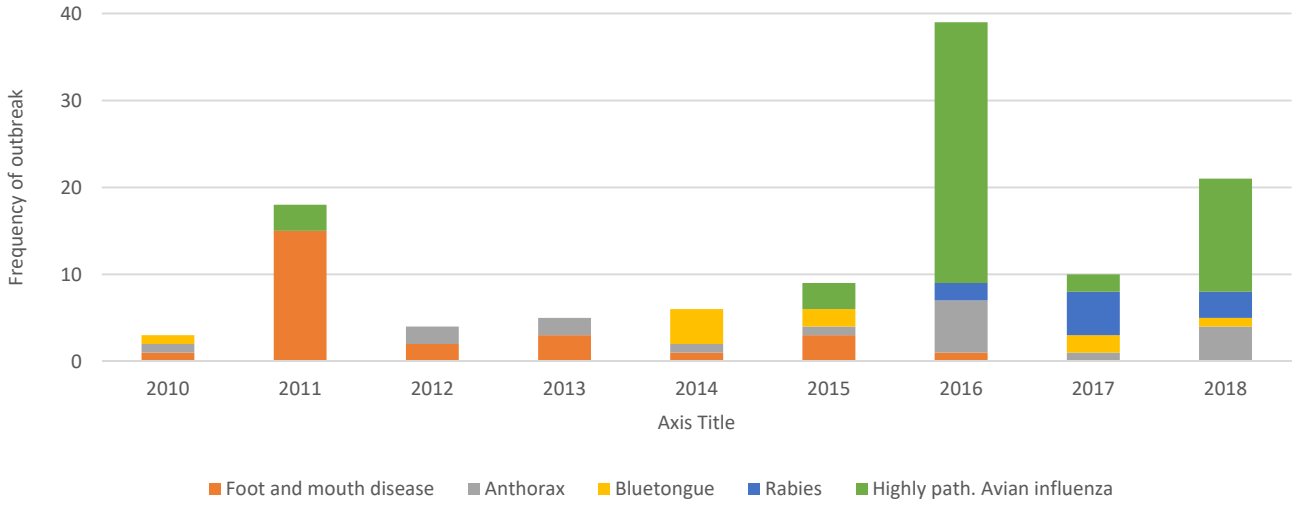
Incidence of transboundary animal diseases is increasing with serious risks for food security.

Transboundary animal diseases (TADs) are highly contagious diseases that can spread extremely rapidly across national borders. Animal diseases such as foot-and-mouth disease, pest of small ruminants and lumpy skin disease spread through a variety of transmission vectors. These include the international trade of live animals, land encroachment, conflicts, smuggling, barriers to animal treatments, the privatization of animal health services and climate change. TADs affect food and nutrition security through reductions in the quality, quantity and safety of livestock production and trade.

TADs such as foot-and-mouth disease (which affects cattle) and pest of small ruminants (which affects sheep and goats) are extremely prevalent in Central, Southern and Western Asia. The types of threats (and number of occurrences) for Asia are as follows: animal and zoonotic diseases (13), aquatic diseases (9), plant diseases (5), locusts (4) and forest pests (2). Threats from TADs in the ECO region have become more important in large part due to the devastating impacts of natural or man-made crises in conflict zones. These have resulted in the wide-scale migration of rural/nomadic people to neighbouring countries, disrupting the animal health control mechanisms of host governments. Currently, protracted conflicts affect many countries in the region, driving millions of people into severe food insecurity and hindering regional and global efforts to eradicate malnutrition and hunger.

The livestock sector plays a critical role in the economic growth of countries, including Pakistan, Tajikistan and Uzbekistan. In Pakistan, livestock contributes 11 percent to the agricultural GDP, largely through milk production, while in Tajikistan and Uzbekistan, agriculture accounts for 25 percent and almost 18 percent, respectively. Prevention of transboundary animal diseases as well as animal-related human diseases would increase livestock's contribution to GDP and provide improved access to food for millions of people. Taken together, growth in both populations and the availability of fat supply among ECO member countries signal a likely transformation in livestock farming and natural landscapes. Regional collaborations and concerted actions are therefore necessary to reduce the threats and manage the risks of TADs, while national and international regulatory systems are needed to respond to existing challenges and prevent the emergence of new outbreaks.

Figure 13. Frequency of animal diseases outbreak reported to the World Organisation for Animal Health (OIE) in ECO countries



Five most frequent diseases: Avian influenza, foot and mouth disease, anthrax, bluetongue and rabies

Box 2. Response to high food losses and waste: Reduction of bread waste in Turkey

In Turkey, bread wastage due to neglect, lack of awareness and improper storage amounted to 6 percent of production or 6 million loaves every day. As a result of a national public information campaign launched by the Grain Board in early 2013, Turkey reduced bread waste by 18 percent and saved a total of 384 million loaves of bread. With support from the government and civil society, the campaign covered 12 major cities, targeting households and bakeries, as well as cafeterias, restaurants and hotels. The campaign was complemented by discussions about food and bread waste in the school curriculum and in mosques, as well as the organization of art and poetry competitions involving as many as 25 million children. The Turkish public responded positively and changed its consumption habits on an entirely voluntary basis. Of all the target groups, households responded especially well to the campaign, reducing bread waste by an average of 40 percent.

By wasting less bread, Turkey also saves more money. According to the Grain Board, reducing unnecessary waste and excess purchases saved consumers an estimated US$ 1.2 billion in 2013. The government subsequently mainstreamed food loss and waste prevention as a priority in its national development plan through 2023. Turkey's success story warrants special attention as a best practice, as the efforts to reduce food waste not only increased savings but also reduced adverse environmental effects in crop farming and contributed to the enhancement of food and nutrition security.

Source: FAO (2013c).

Vandam, Azerbaijan - A vendor displays jams on sale at her stall in a local market.

2.2 Food access

Access to food refers to people's economic, physical and social access to food they need. Economic access is measured by consumers' purchasing power (determined by income and food prices), physical access refers to the state of market infrastructure (roads, railroads), and social access concerns societal norms, social safety nets and social protection and assistance programmes that organize people's access to resources and food.

Incomes have increased across the ECO region over the past seven years. However, this trend has not had a proportional impact on access to food.

Economic growth is necessary for reducing poverty and undernourishment; however, its impact is not automatic and calls for the implementation of pro-poor, inclusive growth policies aimed at reducing income inequality and improving access to food for poor and vulnerable populations. During the period 2000–2017, all countries in the ECO region achieved a substantial increase in the level of GDP per capita. Kazakhstan achieved the largest increase (about USD 1 500), followed by Azerbaijan, Turkey and Turkmenistan (about USD 1 100). Other countries in the region experienced a small but steady increase, while Afghanistan recorded the lowest improvement in GDP per capita.

Overall, the declining trend in the prevalence of undernourishment (PoU) across the region is consistent with the improvement in GDP per capita. Starting from 2010, however, Afghanistan has experienced an increase in PoU (30 percent as of 2017), which can be attributed to the combined effects of internal conflicts, unemployment and population growth. More recently, Turkmenistan and Uzbekistan also experienced stagnation or a reversal in the reduction of the PoU in spite of rising incomes.

The positive association between GDP growth and poverty reduction is also clear: countries with high GDP per capita have low poverty rates and achieve significant reduction in the PoU. National poverty rates indicate that during the period 2000–2015, all countries in the ECO region reduced poverty while the rate and level of reduction varied across countries. The most recent data for Afghanistan, for example, show a rate of 36 percent, while Uzbekistan has a rate of 14 percent, and other countries achieved a rate below 2.7 percent. Kazakhstan achieved a significant reduction from 12.7 percent in 2007 to 2.7 percent in 2015. Turkey and Iran also achieved remarkable progress in reduction of poverty during the same period. Of 10 countries in the region, four are still experiencing high rates of poverty. Evidence shows that poverty rates are higher in countries with a larger share of agricultural GDP, implying a higher rate of unemployment and low incomes in agriculture and rural areas. Broad-based investment in agriculture and rural areas should unlock the potential of agriculture by linking rural areas to urban areas through the development of inclusive food supply chains.

Changes in food prices matter for economic access to food.

Increases in food prices reduce the purchasing power of consumers by depressing real incomes. Experience from the food and fuel price crisis in 2007 and 2008 shows that domestic market food prices are highly vulnerable to volatility in international markets due to the ECO region's high dependence on food imports. As shown in Figure 13 (a, b, c), wheat prices in the ECO region followed the same trend as international prices, with significant increases in 2007–2008 and in 2010. The prices of other basic food items such as meat and potato were also volatile. The effects of food prices will be notably stronger with major consequences for the PoU if the prices of the main staples

rise. Together with slow increases in GDP per capita, adverse changes in world food prices have hampered progress in the reduction of undernourishment, especially in Afghanistan, Kyrgyzstan, Pakistan and Tajikistan, where food imports are high.

Figure 13(a). Market prices of wheat flour (USD/kg)

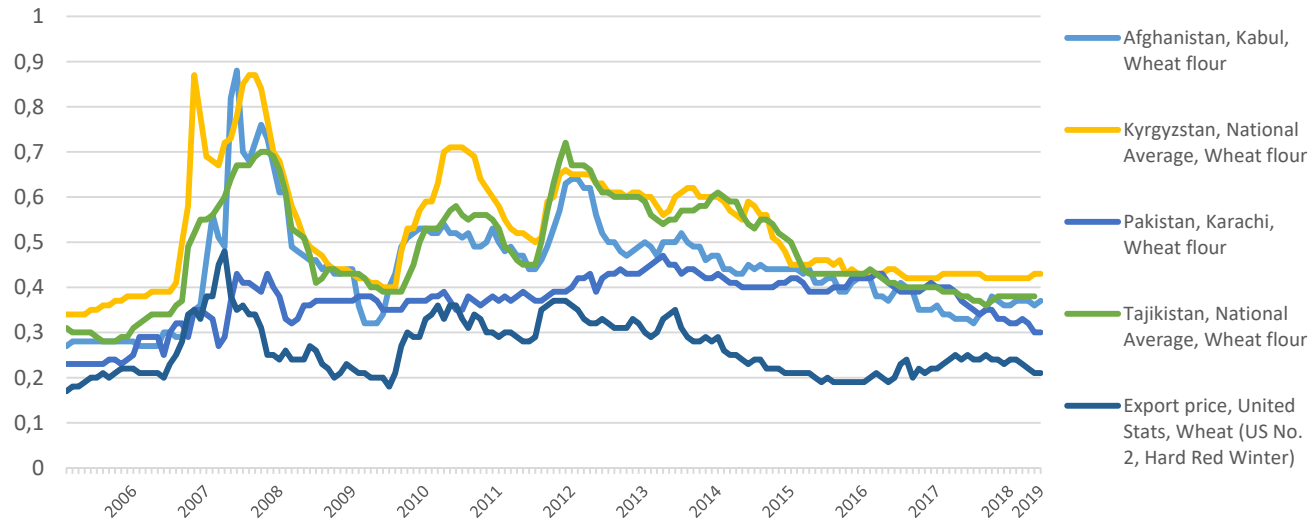


Figure 13(b). Market prices of meat (beef)

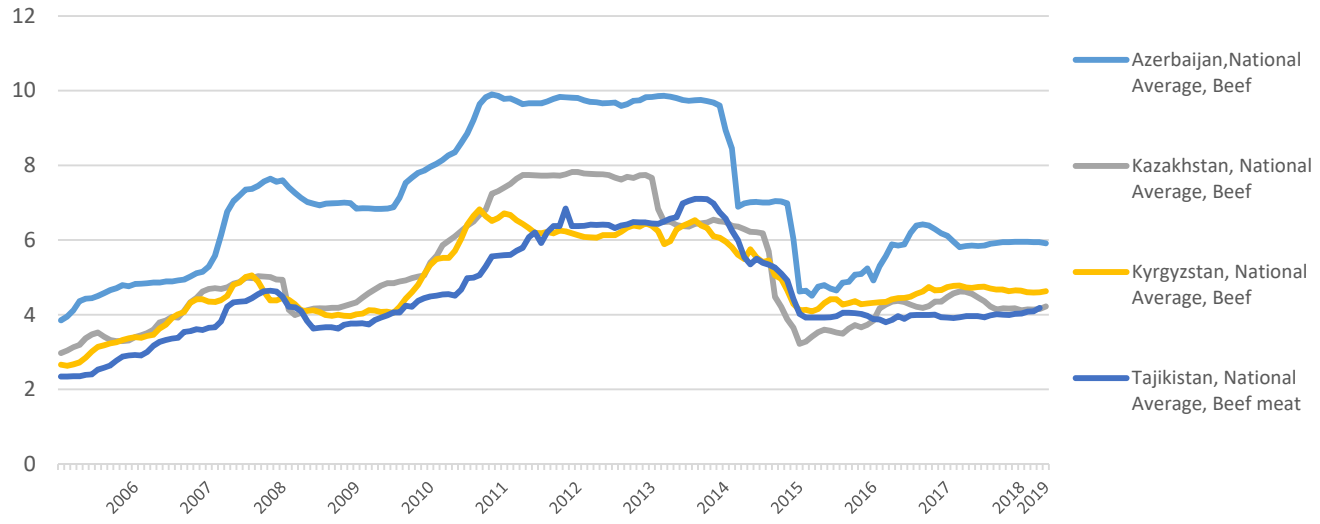
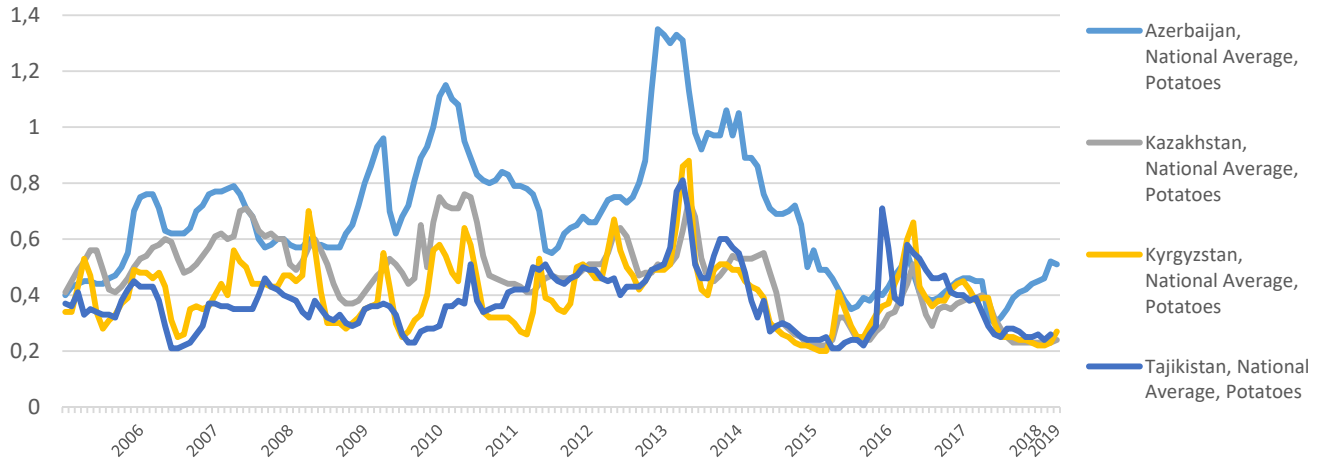


Figure 13(c). Market prices of potato



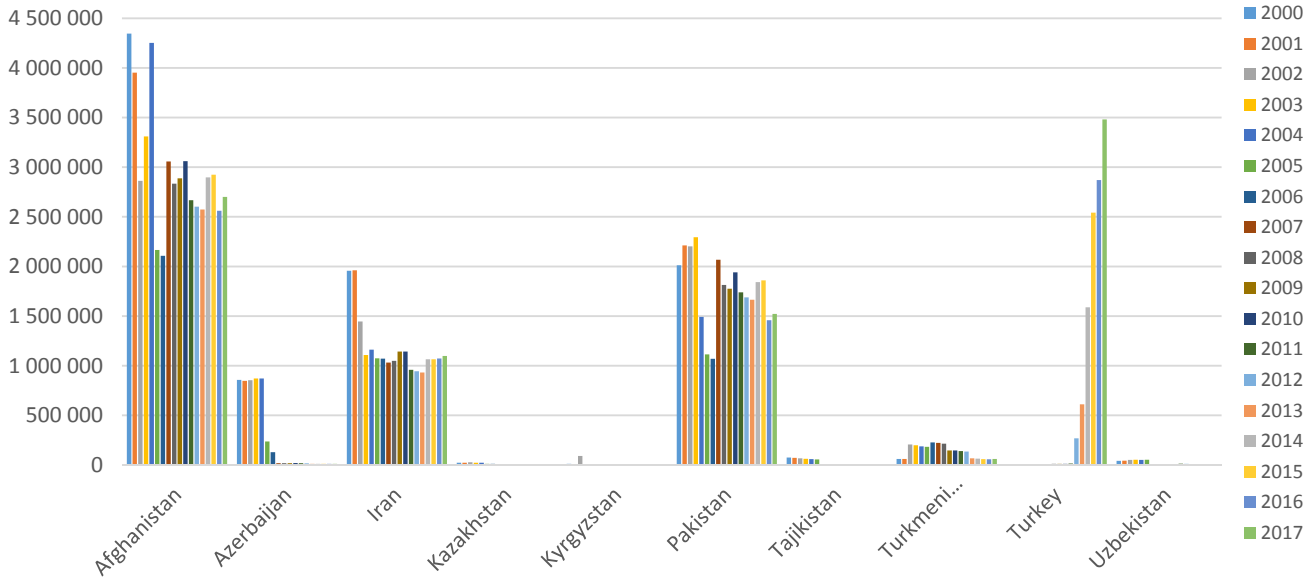
Taken together, prevailing poverty rates and per capita GDP suggest that income distribution is an important component in improving economic access to food for the poor, and that labour market regulations, social protection programmes and safety nets should be coupled with pro-poor, inclusive income distribution policies. Such policies play a role in counteracting the reversal of rising food insecurity, reducing the implied income inequality, and improving access to food for the poor via social protection and safety net programmes.

The depreciation of some national currencies in the region against the US dollar and the euro, which began in 2014 and persisted into 2015 and 2016, affected those countries in the region that are heavily dependent on commodity exports. Commodity exports and fiscal revenues reduced, impacting both food availability through reduced import capacity and food access through reduced fiscal potential to protect poor households against rising domestic food prices in national currencies.

Social protection programmes are under stress in some countries due to an increasing number of refugees and internally displaced people.

Improving physical access to food is a challenging task, especially for Turkey, which is facing a rising influx of about 3.6 million refugees as of 2018. Refugee numbers are also increasing in Pakistan (about 1.4 million), Iran (about 1 million) and Afghanistan (about 76 000) (see Figure 14).[2] These people are more vulnerable to food and nutritional insecurity than the citizens of their host countries as they lack access to land for crop cultivation and do not qualify fully for public social protection programmes. Many are earning their livelihoods in the agriculture, industry and service sectors where they typically receive low wages. The majority of studies monitoring these situations indicate heightened risks of food and nutrition insecurity among refugees. Afghanistan and Azerbaijan are also facing challenges related to ensuring access to food and other livelihood assets for internally displaced persons (IDPs). As IDPs are citizens of their own countries, they are entitled to receive public support from regular public sources, which places an extra burden on the already limited resources of social protection programmes.

Figure 14. Population of refugees and IDPs by country



ECO countries have institutions and structures governing social access to food, but stronger political commitment is needed to strengthen social protection programmes for vulnerable groups.

Social protection policies and programmes are important instruments for improving the well-being of the poorest people and have a significant role to play in the implementation of the 2030 Agenda. This is reflected in SDG Target 1.3: "implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable". Data from the World Bank show that coverage of social safety net programmes (as a percentage of the population) is highest in Kazakhstan and Turkey at 31 percent and 18 percent, respectively, followed by Uzbekistan at 12 percent, and Tajikistan, Afghanistan and Kyrgyzstan at about 9 percent.[3] These programmes cover a wide range of social support services, including cash transfers, disability benefits, in-kind food transfers (food stamps and vouchers, food rations, supplementary feeding and emergency food distribution), school feeding, other social assistance programmes and public works programmes (cash for work and food for work). However, the institutionalization of social access to food is progressing at a slow rate overall, and can be further strengthened by heightened political commitment to ending undernourishment and poverty.

A pro-poor, inclusive development strategy should create jobs for rising populations in general, and unemployed youth populations in particular.

Sources of GDP growth have implications for sectoral employment, incomes, poverty reduction and food security. In particular, the type of technological change (labour-intensive versus capital-intensive) and economic growth affects the food security situation in different ways. In ECO member countries, this distinction is especially important because poverty and food insecurity are usually widespread in rural areas compared to urban areas. Hence, labour-intensive technological change should produce immediate effects in the agricultural sector by creating employment. A pro-poor, inclusive growth strategy should therefore be labour-intensive from the perspective of food and nutrition security, especially in the light of increasing populations and youth unemployment in the region.

According to World Bank data,[4] in the ECO region, overall employment as a percentage of the population did not change significantly during the 2009–2016 period, varying within the 39–72 percent range. Employment in agriculture as a percentage of total employment did not experience substantial change either, varying within the 40–66 percent range. This suggests that GDP growth observed in ECO countries has remained neutral in terms of effects on employment creation.

2.3 Food utilization

Undernutrition has declined, but overnutrition is rising in many ECO countries.

The utilization of food refers to how effectively people consume food. The state of individual health and the physical environment in which food is consumed determines the rate of bodily absorption of nutrients. Having an adequate income ensures access to food, but does not ensure the full utilization of nutrients in the food consumed. Instead, the effective utilization of food depends on four factors: first, individuals should have good health; second, food should be safe and of good quality; third, the physical environment where food is consumed should have safe sanitation and clean drinking water; and fourth, consumers should have a good awareness of the linkages between food and health, and the capacity to make informed decisions regarding the health benefits of their food choices. Agriculture, environment, and health and nutrition policy interventions should target these four areas to enhance the utilization of food.

Food consumption patterns and individual and public health conditions in ECO member countries point to the coexistence of undernutrition and overnutrition. The transition from traditional, short food supply chains to technologically advanced, long supply chains, accompanied by rising GDP per capita, contributes to the increased consumption of highly processed foods rich in fat, sugar and salt, but poor in micro-nutrient content. Combined with sedentary lifestyles in urbanized areas, both excess and unbalanced nutrients ultimately lead to diet-related health problems that carry a substantial socio-economic burden.

Figure 15 (a, b) shows that in most ECO countries per capita supply of vegetable oil and sugar increased between 1995 and 2013. The high calorie content of these foods is reflected in the reduction of the PoU, while their adverse effects commonly take the form of overnutrition (overweight and obesity) which has experienced high growth rates in recent years (Figure 16). As a consequence, food and nutrition challenges now involve both undernutrition and overnutrition. The coexistence of both nutritional outcomes is common among high and middle-income countries, as well as low income countries (Afghanistan and Pakistan) in the ECO region.

Figure 15(a). Daily per capita supply of vegetable oil (kcal/capita/day)

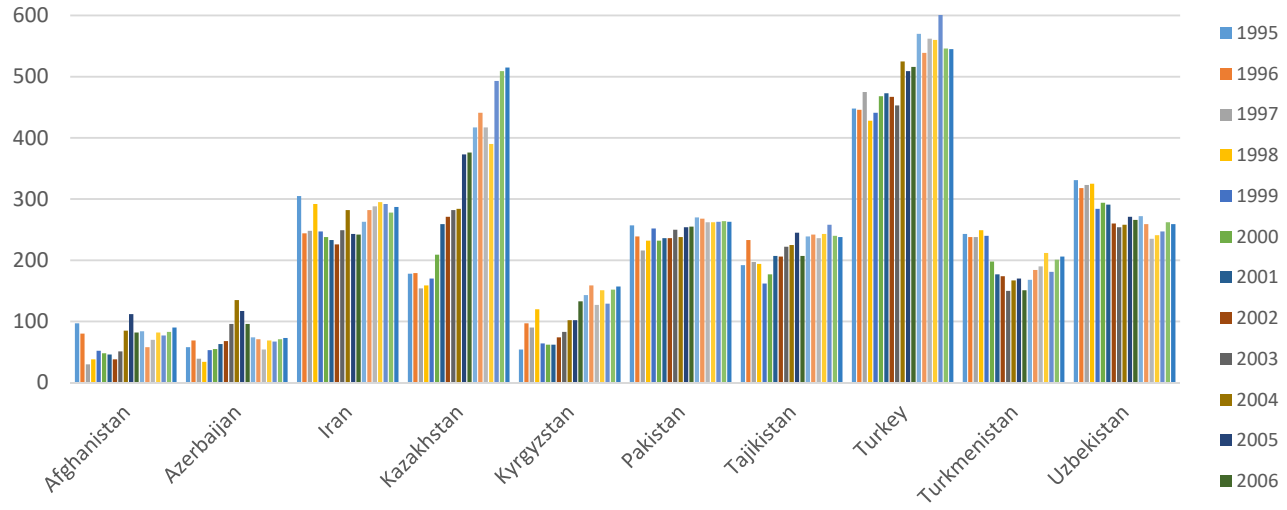


Figure 15(b). Daily per capita supply of sugar (kcal/capita/day)

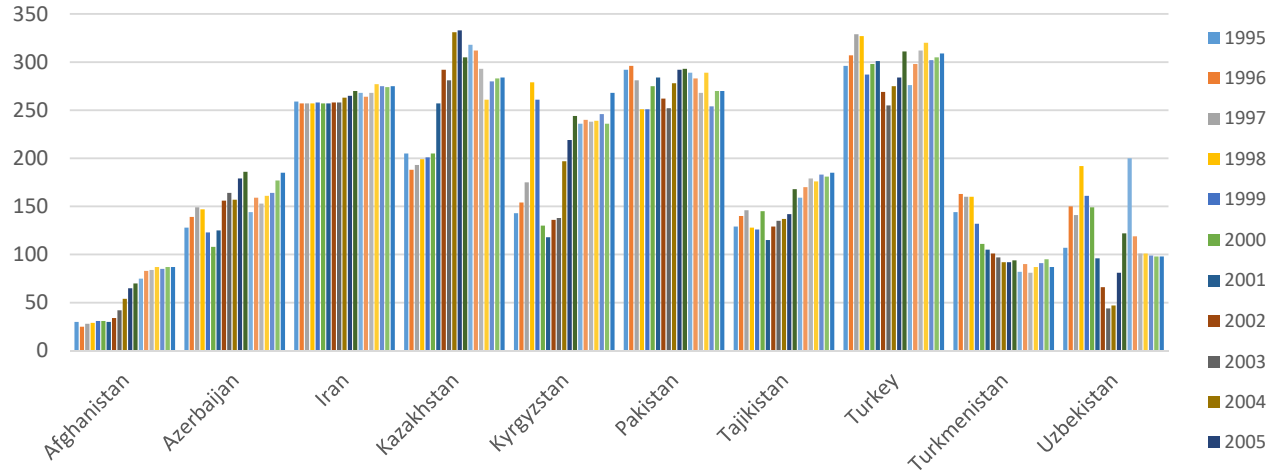
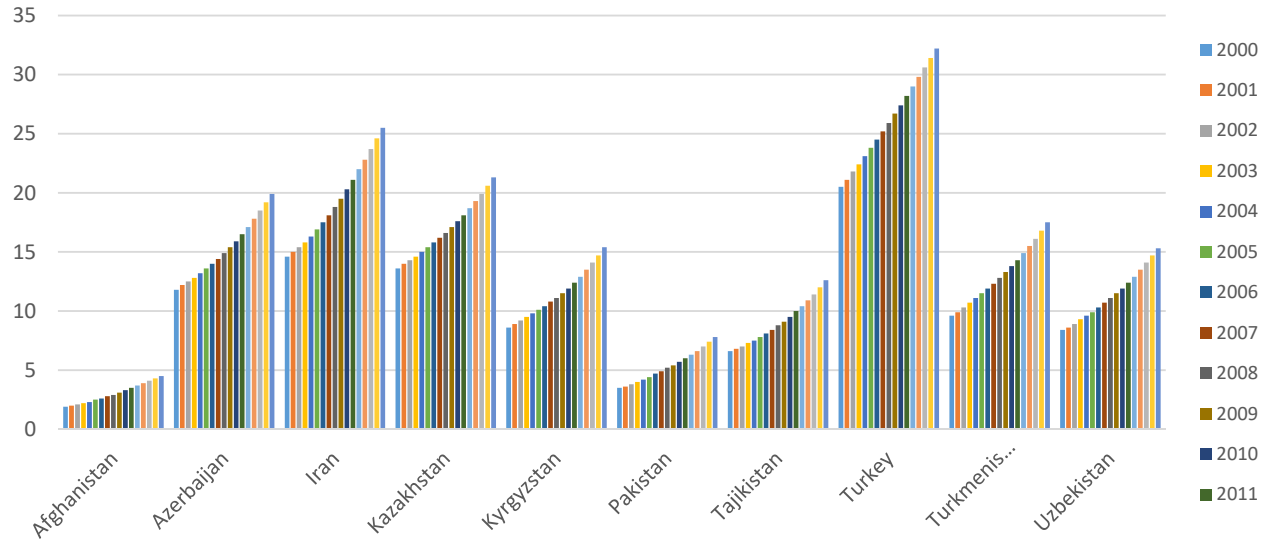


Figure 16. Prevalence of obesity in the adult population (18 years and older) (%)



Obesity is on the rise in the ECO region.

Obesity, a long-term consequence of consuming more energy than considered healthy, is an emerging challenge in the ECO region. It constitutes a major risk factor for non-communicable diseases – the leading causes of death and illness worldwide – and contributes to social inequities. Although not estimated yet, the socio-economic burden of diet-related health problems is expected to be high not only in high-income countries but also in low-income countries in the region. While the SDG framework does not include a specific indicator for adult obesity, eliminating it is included in the target to end all forms of malnutrition. Reducing obesity is important for achieving other SDG targets, such as ensuring healthy lives and promoting well-being for all (SDG 3, Target 3.4).

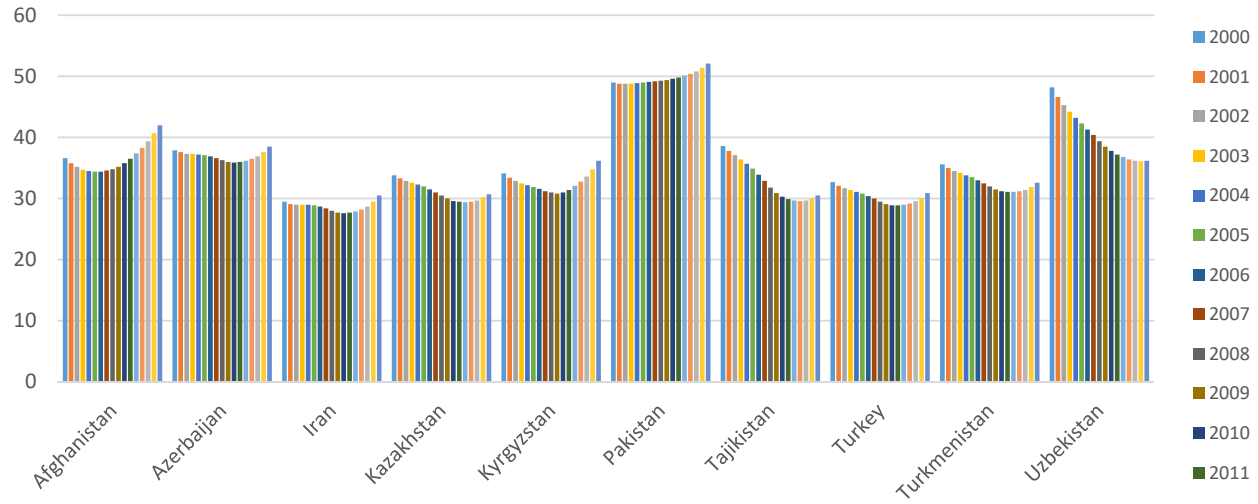
A continuously rising trend in obesity in all countries in the ECO region is reflective of the emergence of diet-related health problems. The pace of this trend has accelerated over the past eight years. As of 2016, Turkey had the highest level of obesity with 32 percent, followed by Iran with 25 percent, Kazakhstan with 21 percent and Azerbaijan with 19 percent; the lowest level was found in Afghanistan with 4 percent (Figure 13).

Anaemia levels remain high across the ECO region.

Anaemia in women of reproductive age is an indicator of both poor nutrition and poor health. Children and women are particularly vulnerable to anaemia. SDG Target 2.2 explicitly calls for the nutritional needs of adolescent girls and pregnant and lactating women to be addressed, as anaemia in women of reproductive age constitutes a public health concern. Anaemia is also closely linked to other SDG targets: lowering its prevalence will help to reduce maternal mortality (SDG 3 Target 3.1) and improve levels of economic productivity (SDG 8 Target 8.2).

The trend over the period 2000–2016 indicates that anaemia declined in all countries in the ECO region until 2012–2013, but thereafter reversed and experienced an upsurge, in spite of population increases in all countries in the region (Figure 17). Overall, the prevalence varies between 30 and 50 percent across ECO countries. Pakistan has the highest prevalence with 50 percent, followed by Afghanistan, Azerbaijan, Kyrgyzstan and Uzbekistan with about 35 percent. The prevalence of anaemia in other countries ranges between 30 and 35 percent. Overall, anaemia remains a threat to the health of mothers and indirectly to the health of children through less time available for child care.

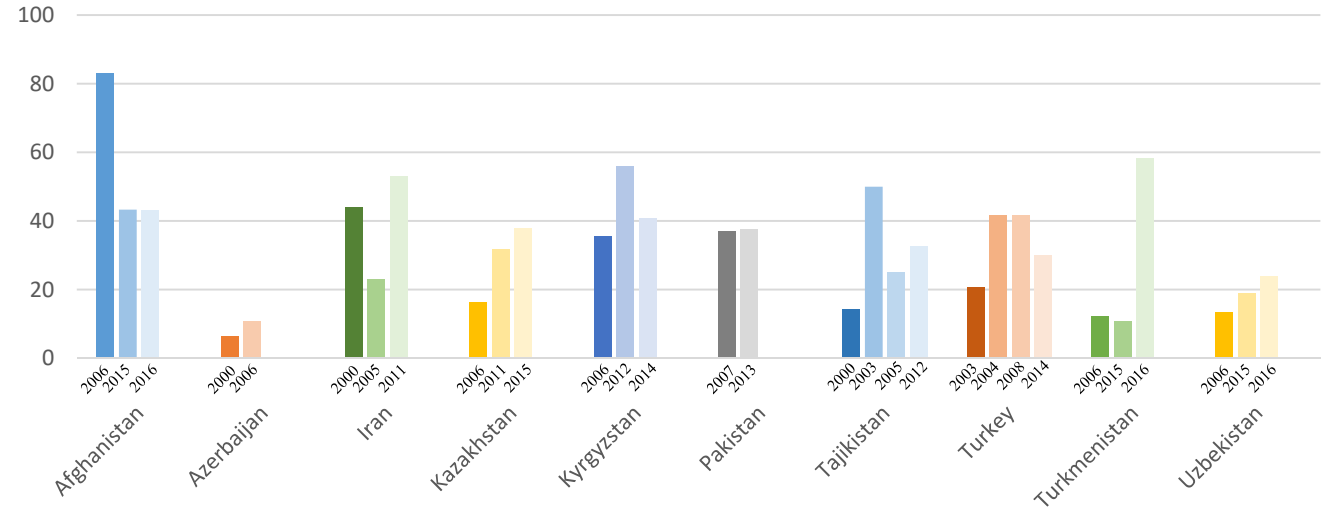
Figure 17. Prevalence of anaemia among women of reproductive age (15–49 years) (%)



Progress towards the breastfeeding target is mixed: some countries have achieved the target, while others lag behind or have regressed.

Breastfeeding directly contributes to ending hunger and child malnutrition. Increasing the rate of exclusive breastfeeding by up to 50 percent in the first six months of life is one of the global nutrition targets. In the ECO region, Turkmenistan and Iran have achieved the target of 50 percent, up from 11 percent and 42 percent, respectively, followed by Kazakhstan and Kyrgyzstan with about 40 percent. A declining trend is observed in Afghanistan ranging from 83 to 43 percent, followed by Tajikistan and Turkey with 30 percent. The rate is significantly lower in Azerbaijan and Uzbekistan compared to other countries in the region (Figure 18).

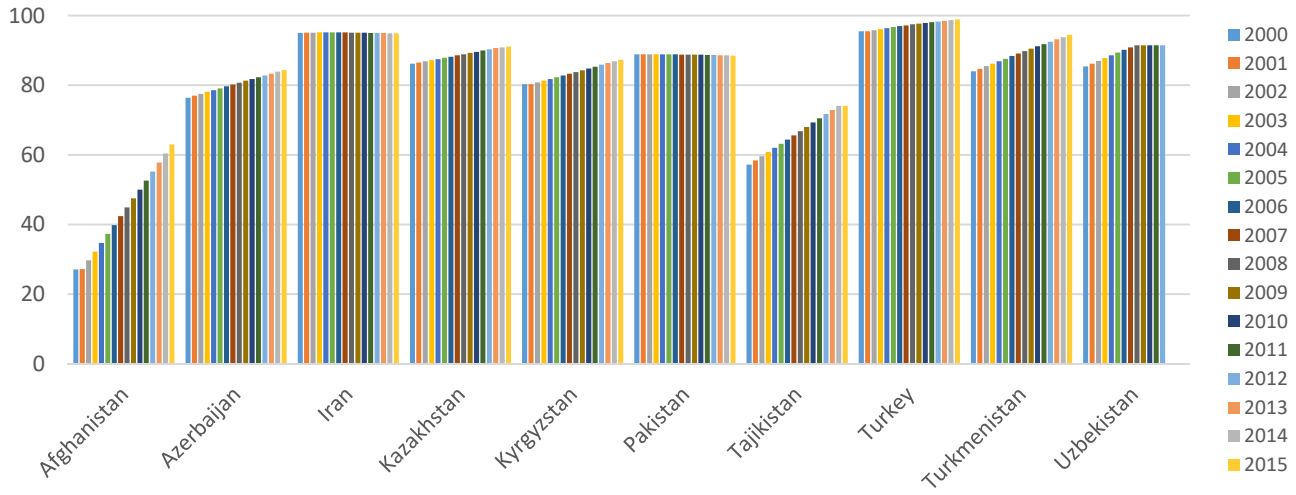
Figure 18. Prevalence of exclusive breastfeeding among infants aged 0–5 months (%)



Progress has been made in creating healthy food consumption environments.

Healthy environments, including improved hygiene and sanitation, access to safe water and awareness of the safe disposal of child faeces, are essential for infants and children to grow free of infection and illness. The most recent data show that the prevalence of managed sanitation service is lowest in Afghanistan with 40 percent, followed by Pakistan with 60 percent and other countries with above 80 percent. With respect to the use of managed water services, Iran has the highest level of usage (90 percent) followed by Turkmenistan (85 percent), Azerbaijan (70 percent) and Kyrgyzstan (65 percent). Although the ECO region made substantial progress up to 2015, disparities between countries still exist, which may reflect unequal progress towards the nutrition targets (Figure 19).

Figure 19. People using safely managed drinking water services (%)



Heightened investment in health in needed to ensure sustainable progress.

The contribution of healthy and safe consumption environments to the utilization of food should not be overlooked. Investing in public health infrastructure is an area that produces high social and economic returns. Data from the World Bank show that government health expenditures across the ECO countries are in general low, and that a noticeable difference exists across countries with respect to the share of government health expenditures in GDP. As of 2016, Iran occupied first place with 4.4 percent of its GDP, followed by Turkey with 3.4 percent, while Afghanistan and Pakistan have the lowest health expenditures (0.5 and 0.8 percent, respectively). The share of other countries in the region ranges between 1.2 and 2.9 percent. Between 2010 and 2017, the share of government health expenditures in GDP per capita was continuously higher in Turkmenistan than the world average; however, these stabilized at 1.2 percent of GDP. In 2017, spending on health care in the European Union stood at 9.6 percent of GDP, ranging from over 11 percent in France and Germany to less than 6 percent in Romania. This share is five times higher than the average (2.1 percent as of 2016) of the ECO region.

Box 3: A food systems approach to preventing obesity

A food systems approach to obesity is based on the premise that the condition can be addressed by developing food strategies based on complex interactions among food subsystems. These include: food production (land use and tenure, soil management, livestock breeding and management, harvesting, and crop breeding, selection and management), food acquisition (food processing, transportation, storage, packaging and marketing, household purchasing, and food use traditions, practices and distribution) and food utilization (food preparation, processing and cooking, household food decision-making, food preferences, and access to health care, sanitation, energy and knowledge). From a food systems perspective, obesity represents a systems failure that can be addressed sustainably only through cross-sectoral solutions that incorporate agriculture, the environment and health. The interactions concerned are structured in such a way as to generate *good health* as an outcome.

While agriculture views obesity as an issue related to the availability of quality food, the health community treats it as a disease. Accordingly, interventions focus on the evident causes of obesity when treating symptoms. With the food systems approach to obesity, strategies can be designed to increase the production of nutritionally adequate food supplies, to promote the acquisition of food through sustainable processes and to enhance the utilization of food in healthy environments. To ensure that these three objectives are accomplished concurrently, agriculture, nutrition and physical environment should be viewed within the larger context of their inherent interrelationships. Furthermore, the design and the actual establishment of a variety of mutually compatible and reinforcing linkages between the subsystems of the entire food system are essential to remedy obesity.

Source: WHO (2018).

Vostochnyi Kyrgyz Republic - A local farmer feeds a cow in her barn.

2.4 Stability

The stability dimension of food security and nutrition is based on the continuity of sustainable food and nutrition security processes involving food availability, access and utilization. Stability of food availability refers to stable agricultural production and trade, as well as the governance of changes in climate change, natural resources and the functioning of ecosystems. Stability of access to food depends on stable employment, incomes and domestic food prices, as well as the resilience of domestic food system to abrupt changes in domestic and world food prices. Stability of food utilization refers to the stability of nutritional intake in a healthy food consumption environment.

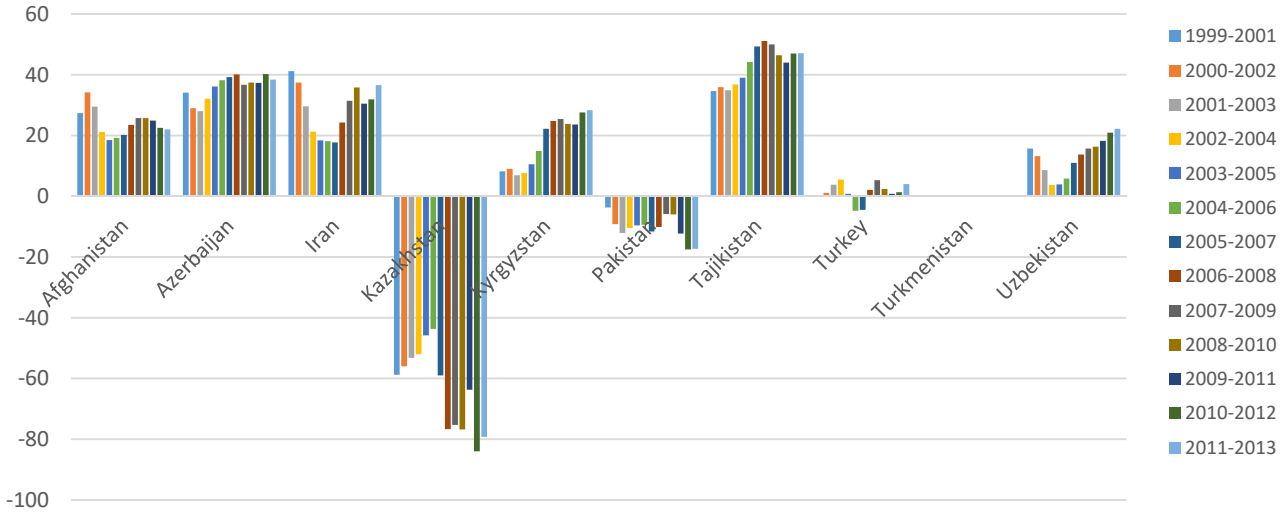
Various SDG targets address the stability of food and nutrition security processes. For example, SDG 1 (no poverty) is linked directly to the *stability of food access*. SDG 2.4 (making food systems resilient to climate change), SDG 13 (combating climate change), SDG 2.B (correcting and preventing trade restrictions), SDG 2.A, SDG 9.B and SDG 11.A (improving infrastructure), SDG 15 (conserving and using land responsibly and halting biodiversity loss) and SDG 17 (enhancing finance, trade and global macroeconomic stability) all contribute to the *stability of food availability*. SDG 12 (responsible production and consumption) aims to improve the *stability of food production and utilization*. Last but not least, SDG 16 (promoting peace) aims to improve the stability of all processes linked to food and nutrition security.

Factors that cause instability in food systems – production, processing, marketing and consumption – vary across countries due to differences in social, political, natural and economic environments. Factors that are relevant to the development context of countries in the ECO region are dependence on cereal imports, variability of food production and trade, increasing frequency of climate-related events, shocks to domestic and world food prices, political instability and conflicts.

High cereal import dependency and a high share of food imports in export earnings may pave the way for future difficulties in food availability, especially when world prices increase abruptly.

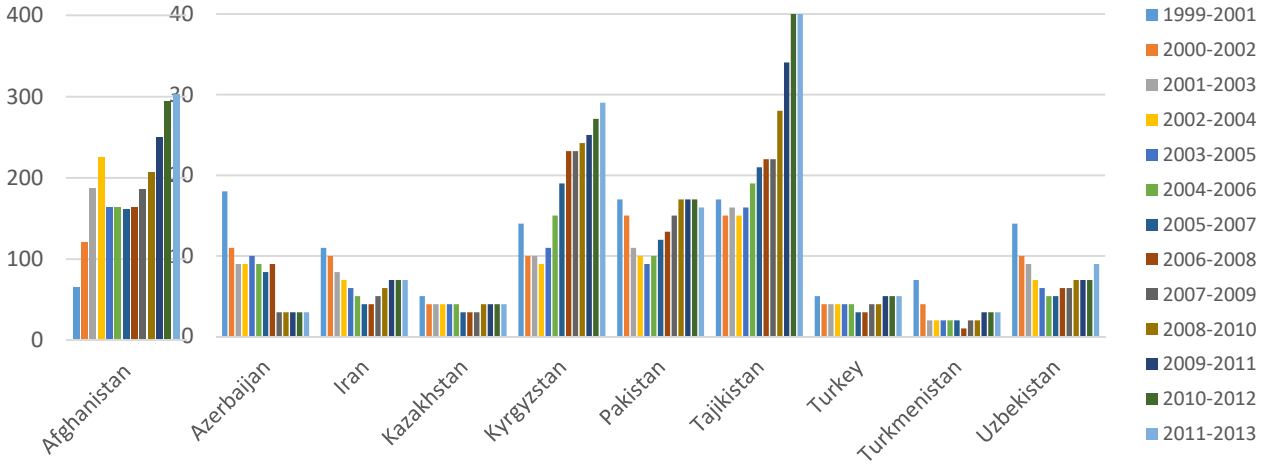
High cereal import dependency plays a critical role with regard to the instability of food availability in the ECO region (Figure 17). Of 10 countries, six have high cereal imports, including Tajikistan (imports increased from 35 percent in 2000 to 47 percent in 2013), Iran (imports increased from 24 percent in 2006 to 37 percent in 2013), Azerbaijan (imports increased from 28 percent in 2001 to 38 percent in 2013), Uzbekistan (imports increased from 4 percent in 2002 to 22 percent in 2013) and Afghanistan (imports increased from 19 percent in 2003 to 22 percent in 2013). Turkey has a low level of cereal imports, and Kazakhstan and Pakistan were net exporters of cereals during the period 2000–2013.

Figure 20. Cereal import dependency ratio (%)



A similarly critical situation is observed when the share of food imports in total exports is considered (Figure 21). Afghanistan has an exceptionally high rate with the share of food imports increasing from 65 percent in 2000 to 300 percent in 2013, while the share in Tajikistan rose from 20 percent to 40 percent, and the share in Kyrgyzstan increased from 14 percent to 29 percent. Since export earnings of other countries in the region increased substantially during the period 2000–2013, they were able to finance food imports for their populations. Together, high cereal import dependency and a high share of food imports in export earnings may pave the way for future difficulties in food availability, especially when world prices increase abruptly due to oil price shocks or political instability in trade partners.

Figure 21. Share of food imports in total exports (%)



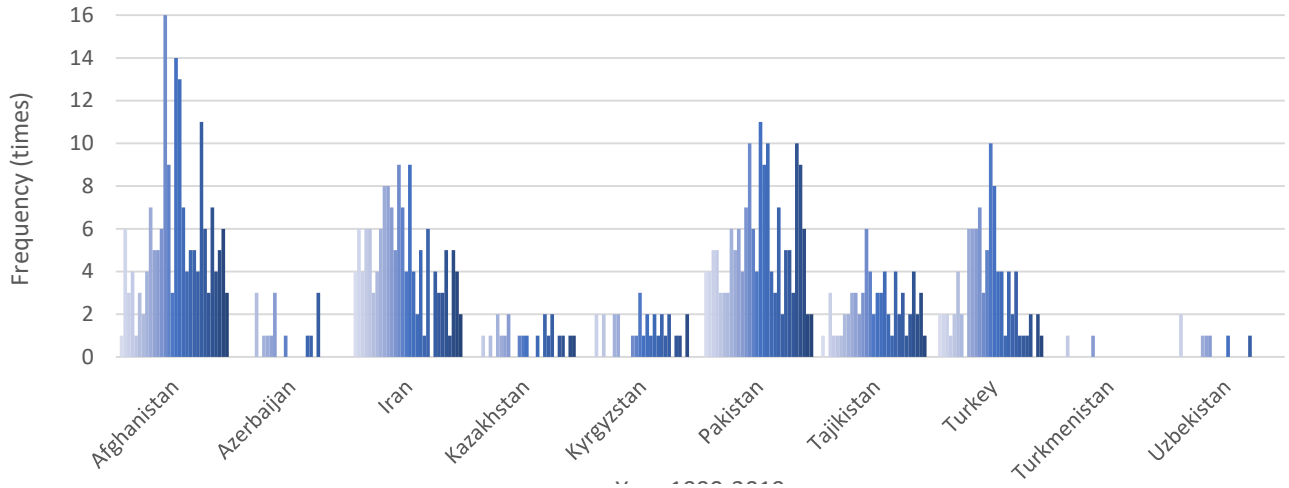
With respect to changes in domestic food production, Kazakhstan, Iran and Turkmenistan show high variability over the period 2000–2013. When food trade is also considered, the instability of food supply increases and all countries in the region experience significant variations in food supply. This indicates that changes in international food prices are highly likely to cause instability in availability as well as access to food, unless governments take measures to prevent price hikes from impacting domestic price levels and support vulnerable groups. The most recent available data for 2016 indicate that food prices have changed abruptly in Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Pakistan and Turkmenistan.

The ECO region faces specific threats to food stability. The food import and energy and agricultural commodity export dependencies of Tajikistan and Afghanistan create vulnerability to external shocks on international commodity markets, which have consequences for domestic commodity prices and food affordability for the poor and vulnerable. The scale of land degradation, water scarcity and natural hazards destabilize agricultural production and yields, while inefficiency along food supply chains leads to large-scale food losses and waste.

Conflicts and natural disasters risk the stability of food and nutrition security. Climate change further threatens the stability of food production and consumption.

The food security situation in Afghanistan is especially challenging, as internal conflicts are taking a heavy toll not only on the current generation but also on future generations, due to the loss of resources that could have otherwise been invested in the development of human capital. In addition to internal conflicts, countries are also affected by natural disasters (droughts and floods) that cause damage to agricultural land and soil and transportation and water infrastructure, decreasing both food supply and access to markets. Climate change will exacerbate such threats to food security through a combination of increasing magnitude of climate hazards, diminishing agricultural yields and production, and intensifying competitions over scarce resources. Climate-related disasters such as floods, landslides and extreme temperature have become more frequent over the last three decades (Figure 22). Therefore, ensuring the stability of food and nutrition security is of increasing importance. A number of structural challenges, such as the unsustainable use of natural resources, food losses and waste, and the growing prevalence of natural disasters place an additional burden on the livelihoods of poor and vulnerable population groups. In addition, the capacity of agricultural production systems to resist, absorb and recover from the effects of a hazard needs to be strengthened to ensure stable food production. The global cost of climate change adaptation is estimated to be about 0.5 percent of GDP per year, which is far below the economic cost of the changes taking place, suggesting that adaptation to climate change should be seen as an efficient public investment.

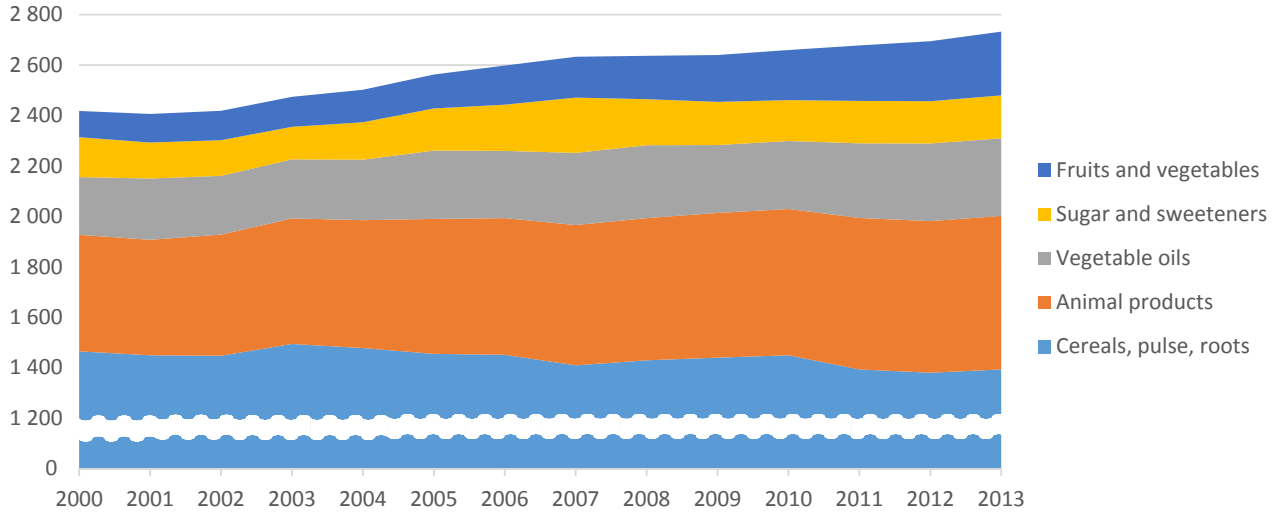
Figure 22. Frequency of climate-related natural disasters (floods, landslides, extreme temperature, storms) by year



Population growth and urbanization demand productive and stable food systems to meet rising food demand.

Economic and population growth accompanied by rising urbanization and changing dietary habits place increasing stress on agricultural and food systems. In general, decline in cereal intake has been offset by increases in vegetable oils, sugars and meat products (Figure 23). In the case of agricultural and food production, there is a need to address the negative effects of current production systems and technologies on the environment and natural resources, and the effects of climate change on agricultural production. In regard to consumers, there is a need to control excessive food consumption, to adopt more nutritious and varied diets, and to reduce food waste and losses, and individual environmental footprints (FAO, 2013b). Both consumption and production should move towards increasing the economic, social and environmental sustainability of agricultural and food systems. The development of a sustainable food system is key to the stability of food and nutritional security, as these systems are geared to meeting the food needs of both present and future generations without jeopardizing their economic, social and environmental bases.

Figure 23. Changes in dietary energy supply by food type (countries in the Central Asia subregion, 2000–2013)



Food which is eventually lost or wasted represents not only loss of resources but also emissions and waste generated during the different stages of the supply chain. Thus, food losses and waste constitute an obstacle to the sustainability of food systems, and reducing loss and waste is key to improving the economic, social and environmental performance of food systems. Food losses and waste affect all dimensions of food and nutrition security.

The state has an important role to play in reducing disruptions in food supply.

The state plays a key role in ensuring the stability of food supply in Afghanistan, Pakistan, Tajikistan and Kyrgyzstan, where natural disasters often disrupt distribution channels. It has to ensure the stability of food supply, design incentives for safe food production of adequate nutritional quality, and facilitate access to food for the most vulnerable consumers. Sustaining the stability of food supply systems not only ensures the availability of sufficient food for consumption, but also ensures stable food prices and guarantees a certain level of food safety and quality, which in turn affects nutrition security and food utilization.

PART 3

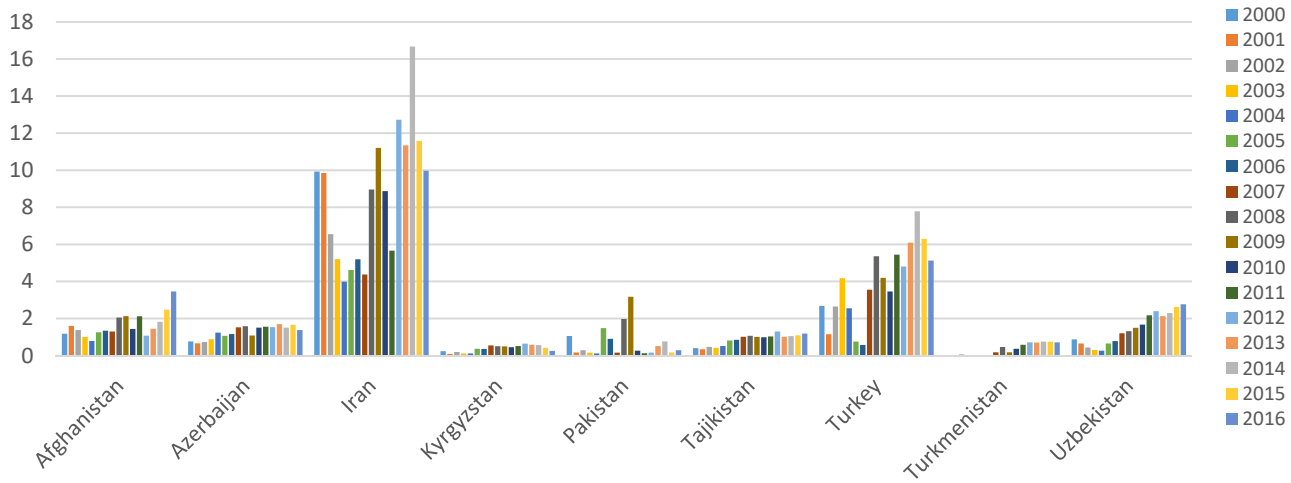
Part 3. Food and agricultural trade in the ECO region

Food and agricultural trade is an important dimension of food security and nutrition, and has an immediate impact on food availability and the stability of food security processes. Developments in the area of food and agricultural trade highlight a number of patterns that have implications for the future of food and nutrition security in ECO countries.

Imports of staple crops increased in almost all countries over the past two decades.

Food is made available mainly through two sources: domestic production and imports (food aid in some countries). Over the last two decades, in many countries domestic production has not kept pace with steady growth in population and consumption. The yields of key staple crops, including wheat, rice and potatoes, have been stagnant and lower than global averages, while their consumption has maintained an increasing trend. This widening gap has been accommodated by imports from non-ECO member countries, including the Russian Federation, India and China in the case of rice imports. Intra-regional technology transfer combined with sustainable, productivity-enhancing agricultural practices should unlock the agro-ecological potential of the ECO region, increase yields and reduce food import dependency.

Figure 24. Import of cereals (million tonnes)

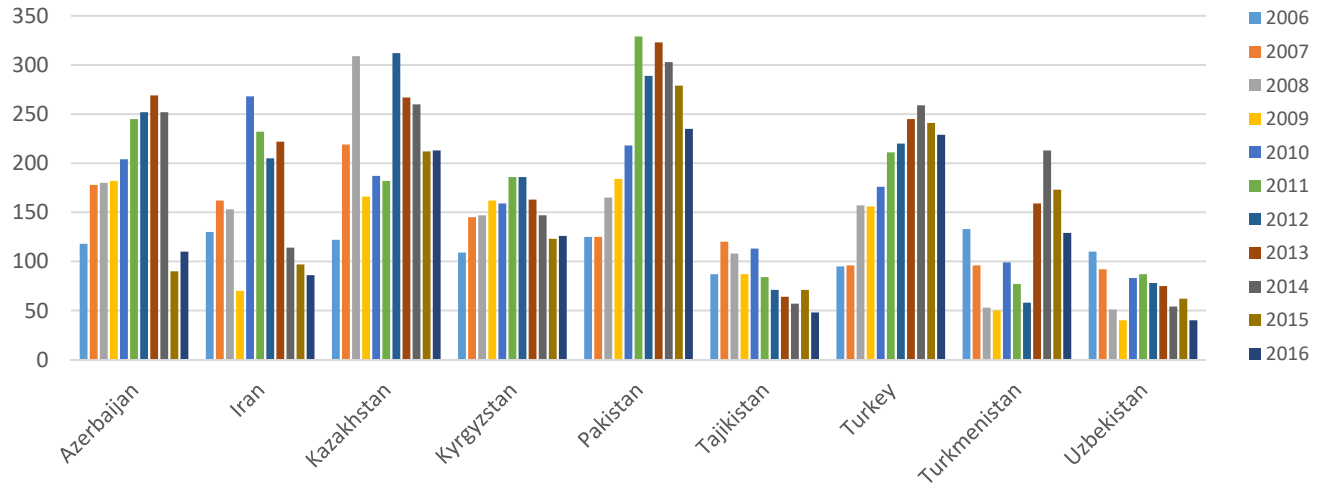


Agricultural exports declined recently in almost all countries.

The agricultural export value index reflects changes in the sum of values of exported agricultural products. Across almost the entire ECO region, agricultural exports have deteriorated since 2012–2013 (Figure 25).This pattern may be attributed partially to structural constraints on agricultural productivity, in particular land, soil and water, coupled with rising population and incomes. Fluctuating world market prices for cereals further increase the risks that affect food-importing regions. In Turkey, for example, the major driver of soil degradation is economic transition, while in Central Asia and the Caucasus, the main drivers are population growth and climate change, coupled with unsustainable land and water management and risks of droughts. Active participation of the countries in global and regional partnership mechanisms, such as the Global Soil Partnership, help to facilitate the adoption of sustainable soil management practices in the ECO region. Figure 25 shows an extremely high percentage (above 300 percent) of food imports relative to total exports

in Afghanistan, followed by Tajikistan with close to 40 percent, Kyrgyzstan with 25 percent and Pakistan with about 20 percent. Political instability, ongoing conflicts and dwindling infrastructure are responsible for the current emergency in Afghanistan. The situations in the other three countries are affected mainly by the structural characteristics of agricultural production.

Figure 25. Agricultural export value index (2004–2006 = 100)



Ample scope exists for growth in agri-food exports in ECO countries.

Since the dissolution of the Soviet Union, the countries in Central Asia and the Caucasus have established trade flows among the post-Soviet economies, and explored new international markets such as China and the European Union. Agricultural production in these countries has been diversified in favour of crops that are commercially more attractive, such as vegetables and fruits.

However, agri-food exports are hampered by food safety issues facing the ECO countries, and addressing these challenges requires investment in agricultural and food technology development/transfer/innovations. High-level political commitment is necessary to implement policies that favour agricultural growth and the integration of these economies with world markets. Afghanistan, Iran, Kazakhstan, Kyrgyzstan, Tajikistan, Turkey and Pakistan are all members of the World Trade Organization (WTO), but the food safety concerns of importing countries hamper the agricultural trade capacities of the ECO countries.

Structural problems in the agricultural sectors of the ECO member countries also hinder agri-food exports. For example, the agri-food sector in Azerbaijan has a small number of medium-size and large agricultural enterprises, while the bulk of production is concentrated in semi-subsistence family farms. In spite of state support to the agricultural sector, including tax exemptions, financial assistance for agricultural inputs and so on, the agri-food sector remains weak. State support for agriculture is found in almost all countries in Central Asian with a view to creating a viable agri-food sector, however progress has been limited.

The majority of ECO countries have participated in or are in the process of participating in the WTO. However, major trade policy differences across ECO member countries risk potential gains from food trade. Food safety remains the most challenging issue facing the ECO region as a whole.

Countries in the ECO region have adopted different trade policies: some are eager to integrate into world markets, while others impose trade restrictions especially on food products of strategic importance. Azerbaijan, Kyrgyzstan and Turkey promote exports, while Uzbekistan implements heavy import duties and import/export limitations on certain strategic products. In the case of wheat, a commodity of strategic importance, Azerbaijan sets the import duty at zero. To promote exports, the state has established special institutions to support logistical and cargo handling centres for the export of perishable food products abroad. In Kyrgyzstan, efforts are underway to align the Sustainable Development Strategy of the Kyrgyz Republic with SDG 2. Strategy 2040 focuses on the promotion of agri-food exports and spillover effects on rural employment. Turkmenistan is a net importer of dairy products, sourcing over 95 percent of its domestic consumption from abroad.

Export promotion is highly likely to improve the stability of food supply.

Export promotion measures remain key policy instruments among ECO countries (FAO, 2016a). During 2015–2016, Azerbaijan, Kyrgyzstan and Turkmenistan adopted export support programmes, including for agri-food exports. In Tajikistan, Regulations on the Standing Commission for the Stimulation of Domestic Production and Development of Export were approved on 30 December 2015. In 2015, Kyrgyzstan developed a new Export Development Plan (EDP) aimed at creating basic conditions for achieving a more attractive foreign trade regime and improving the competitiveness of Kyrgyz goods. In Uzbekistan, the Uzpakhtasanoatexport Holding Company for the Acceptance, Processing and Export of Cotton Fibre, and the Uzagroexport Specialized Foreign Trade Company for the Export of Fresh and Processed Fruits and Vegetables were established in 2015–2016 to improve the competitiveness and export capacity of domestic products.

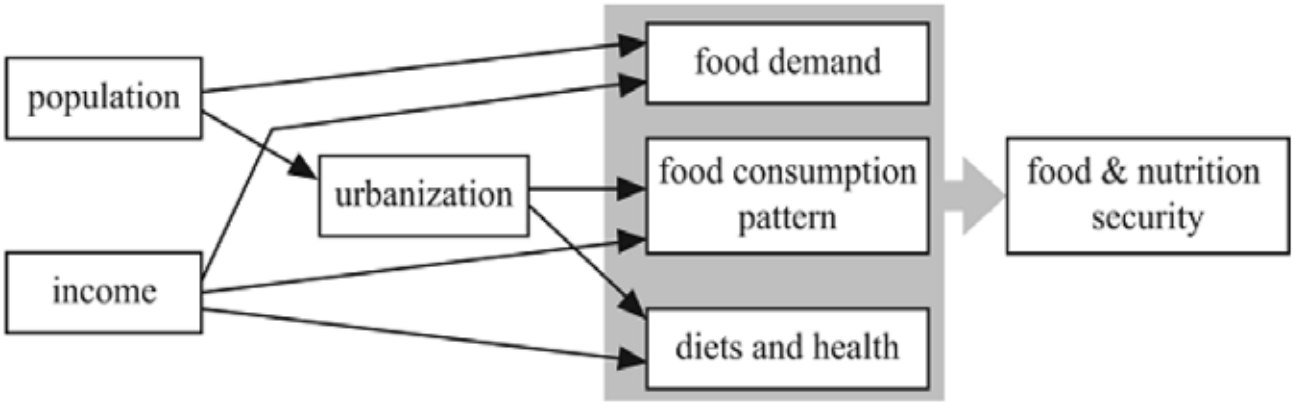
PART 4

Part 4. Outlook towards 2030

4.1 The impact of demographic changes and income growth on food and nutrition security

Food security and nutrition is linked to four types of changes: changes in population, incomes, urbanization and agricultural production (Figure 26). These changes are non-linear and dynamic with feedback effects, and their implications for food and nutrition security should be assessed locally, taking into account the internal dynamics of economies in particular and societies in general. This is to say that increasing populations and incomes, for example, may be desirable in the specific context of some societies, while undesirable in the context of others depending on the expected potential gains. However, some tendencies (independent of time and space) are implied by natural physical processes, such as more food and nutrition is needed to feed more mouths. The food and nutrition situation, therefore, should be assessed by considering the specific conditions of the societies examined and, at a higher level, the socio-economic priorities of governments. This section reviews the food and nutrition security situation in ECO countries taking into consideration the four types of changes taking place concurrently in the region since 2000.

Figure 26. Pathways of linkages from population and income to food and nutrition security



Increasing populations mean higher demand for food in the future.

The relatively large populations of Afghanistan, Iran, Pakistan, Turkey and Uzbekistan account for the majority of population growth across the ECO region, with the regional population increasing by about 67 million people during the period 2009–2017. Pakistan alone accounts for 45 percent of this increase (about 30 million people) with only 36 percent (about 11 000 million people) in urban areas. The remaining 55 percent (about 37 000 million people) in the rest of the region is divided equally with half of this growth (about 18 500 million) found in urban areas. In total, population increase in the region has created an extra 30 million people in urban areas, exerting significant pressure on food production and public services (education, health, water, electricity). With an urbanization rate of 75 percent, Turkey and Iran together added a total of 17 million people to their urban areas, whereas Pakistan alone added about 11 000 million.

According to the latest projection by UN DESA,[1] the total population of all ECO member countries will increase by 188 million people by 2050. The population growth rates in most ECO countries are significantly higher than the world average. Based on population growth trends between 2009–2017,

a significant portion of the population growth will take place in urban areas. The highest urbanization rates are projected for Iran and Turkey. This current and expected population growth in the ECO region needs to be met by increased food production, which would in turn place extra strain on agricultural resources and the environment. Sustainable agricultural practices should therefore be adopted to ensure the livelihoods of current and future generations.

Increasing urbanization and rising incomes provoke changes in food consumption patterns.

It is also expected that people's income levels will continue to rise in all ECO member countries. According to the latest projection by the International Monetary Fund (IMF),[2] per capita GDP is estimated to increase substantially in most ECO member countries. Combined with sedentary lifestyles in urban areas, higher purchasing power would mean easier access to food, especially prepared food and highly processed, nutritionally low-quality food, due to the higher opportunity cost of time in urban areas. This trend is particularly relevant for Turkey, which has experienced a rise in population and incomes, as well as the growth of long food supply chains marketing processed food in bulk.

Another trend, related to income growth, that has emerged in the ECO region over the past two decades is the shift in food availability (in terms of calories) away from cereals, roots and tubers towards meat, fat and sugar (see Figures 12 (a, b and c)). These trends have important implications for food and nutrition security in the ECO region. First, agriculture needs to respond to the changing pattern of food demand, which calls for a reorientation of the use of agricultural endowments (environment and natural resources), technology development and transfer strategies, and agricultural trade policies. A new agricultural orientation will affect not only food availability but also give shape to food access through its effects on agricultural growth, employment and incomes. Second, the changes in food consumption patterns, created by urbanization, will affect people's health through a rise in diet-related health problems. They will also result in environmental degradation since diets based on higher meat consumption are more likely to result in deforestation, the release of CO_2 gas emissions and human health deterioration. The over-consumption of food, coupled with lives that are increasingly sedentary, is producing large numbers of people who are overweight and obese (see Figure 16). The number of obese adults and overweight children under 5 years of age has already increased in the ECO region, especially in Turkey, Iran, Azerbaijan, Kazakhstan and others. The factors behind such a pattern are complex, and range from biological needs to economic, culture and social changes.

Population and income growth have implications for diets, health and food, and nutrition security.

The interaction between population growth, changes in diets and food insecurity is not straightforward. Income growth links population growth to food insecurity. Therefore, income growth strategies, such as inclusive growth, pro-poor growth, export-oriented growth, labour-saving growth and so on are important as they attach different characteristics to the growth processes. This means that population growth will not necessarily lead to food insecurity, even in the presence of income growth, if the growth processes are governed effectively. Key elements of effective governance include, but are not limited to: (1) balancing the trade-off between agricultural production and its adverse environmental effects through sustainable agricultural practices, (2) investing in agriculture and health to produce nutritionally rich crops while improving food consumption environments, (3) investing in health and education to raise awareness of the negative effects on health of unbalanced diets and of the burden

2 See www.imf.org/external/index.htm.

of unhealthy diets on well-being and livelihood, and (4) creating an environment for smallholders to access food supply chains. At present, the countries in the ECO region as well as others in low and medium-income groups face challenges in managing the transition from urbanization to food security.

Large-scale, long-lasting conflicts lead to demographic changes and are a direct threat to food security.

Conflicts in the ECO region and its immediate neighbouring countries have resulted in a large influx of refugees, representing a direct threat to food and nutrition security in the region. Conflict in Syria has had a major impact on the levels and patterns of international migration in recent years. As of 2017, the estimated outflow from Syria had reached about 5 million refugees, the majority of which entered neighbouring countries, contributing to an unusually large influx of migrants to Turkey (about 3.6 million) (see Figure 14). As of 2017, Iran (1 million) and Pakistan (1.4 million) were also hosting large refugee populations, but the trend over the period 2009–2017 shows a decline in the number of refugees arriving to these countries. Afghanistan has also been suffering from a long conflict and political instability, and during the past two decades about 2.6 million of its population has sought refuge in neighbouring countries. The food security and nutrition situation of refugee populations represents a challenge for host countries as they face dilemmas in allocating public resources originally created to meet the needs of their own citizens.

Avoiding adverse effects on food and nutrition security requires cross-sector collaboration and broad-based investment.

Concerted action by multiple sectors is required to manage the effects on agriculture of increasing demand for food, and the effects on food utilization of changing food consumption patterns and diets, including those related to agriculture, the environment, health, nutrition and social protection. A broad-based rural development strategy is necessary to enhance the capacity of agriculture to meet the increase in food demand. Improvement of soil fertility and the development of drought-resistant crops by investing in agricultural R&D, as well as investment in rural infrastructure such as roads, irrigation and storage facilities, would likewise increase agricultural productivity. These investments, if made, could also have serious environmental impacts. Thus, investment in sustainable technologies able to support increased agricultural intensity will be crucial for both meeting the demands of a growing population and adapting to environments increasingly affected by climate change.

Increased production of food alone will not end food insecurity. Projections suggest that slower population growth could significantly lower malnutrition along with increased agricultural productivity, economic growth, and investment in health and education. Investment in family planning and reproductive health can improve families' well-being at the household level, while helping to slow population growth in areas most affected by food insecurity.

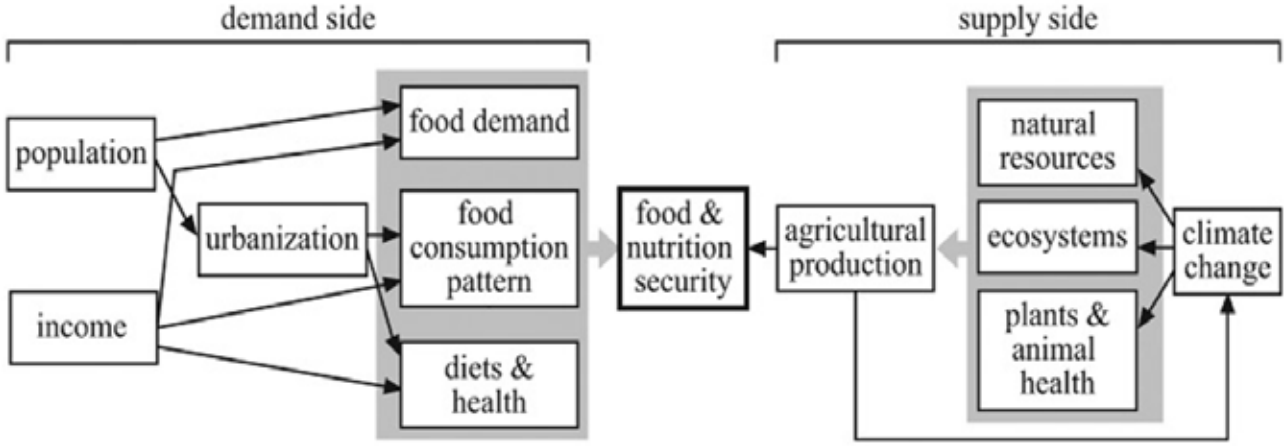
Investment in the development of inclusive agri-food value chains is also a viable strategy that promises to substantially reduce the burden of malnutrition by enabling smallholders to beneficially market their produce, and women and youth to engage in employment for improved livelihoods.

4.2 The impact of climate change on food security and nutrition

Linkages between climate change and food production

The impacts of climate change on food production are clear (Figure 27). Critical factors work through three main pathways to impact agricultural production. Erratic changes in precipitation and temperature, and global warming result in: (1) deterioration in natural resources used in the production process, including water, land and soil; (2) deterioration in ecosystems (e.g. forests, mountain, marine, desert, wetlands etc.) and ecosystem services (i.e. for food production, climate control, oxygen production and nutrient cycle regulation, and recreational benefits); and (3) damages in plant and animal health caused by new strains of pests. Together, they put agricultural systems at risk of failure, which has detrimental effects on human livelihoods. Adaptation strategies play a key role here in adjusting natural/human systems in response to actual/expected climatic stimuli or their effects in such a way as to exploit beneficial opportunities.

Figure 27. Pathways of linkages between climate change and food security



Conversely, agriculture also contributes to climate change through significant greenhouse gas (GHG) emissions (carbon dioxide, methane and nitrous oxide) caused by deforestation, livestock production, and soil and nutrient management, leading to global warming which in turn adversely affects agriculture and food production. Over the past 50 years, GHG emissions resulting from agriculture, forestry and other land use have nearly doubled, and projections suggest a further increase by 2050 (FAO, 2017b, pp. 39–45). Mitigation strategies play a key role here in aiming to reduce emissions sources or enhance the sinks of GHGs. They include methods of food production that release fewer GHG emissions per unit of food, such as intensifying cattle production to allow more food to be produced from fewer animals. Relative to the total world GHG emissions from agriculture, the ECO region's contribution as a whole is very small at around 6 percent (FAO, 2016a, e).

Meeting SDG 2 in the ECO region calls for the development of sustainable food and agricultural systems that are resilient to natural hazards and climate change. Reducing the adverse effects of climate change on food security and nutrition lies at the cross section of a number of the SDG goals. Progress towards SDG 1 (No Poverty) would decrease the stress on forests and land encroachment. Progress towards SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), SDG 12 (Sustainable Consumption and Production), SDG 13 (Climate Action), SDG 14 (Life Below Water), and SDG 15 (Life in Land) would all contribute to the reduction or control of GHG emissions.

Climate change is a threat to food and nutrition security.

Food and nutrition security is threatened not only by supply-side constraints such as climate change on agricultural production, but also by rising food demand from agriculture due to population growth, urbanization and income growth (Figure 27). These pressures on agriculture will lead to higher food prices, which in turn will reduce vulnerable people's access to food. Meanwhile, climate change will also reduce the earnings potential of smallholder producers due to declining agricultural production. Overall, climate change could increase the population living in poverty by between 35 million and 122 million by 2030 relative to a future without climate change, largely due to its negative impacts on incomes in the agricultural sector (FAO, 2016a, e).

The effects of climate change are not limited to agricultural production and food prices, and may further affect the nutritional properties of some crops in terms of lower mineral (e.g. wheat, rice) and protein concentrations, and higher carbohydrates concentrations (FAO, 2015). They may also increase the incidence of diseases, particularly water-borne diseases, such as diarrhoea, that contribute to undermining the body's ability to utilize the nutrition in food. Higher temperatures and less rainfall will make clean water less available in many areas, compromising hygiene and facilitating the spread of water-borne pathogens. The World Health Organization (WHO) estimates that in the future (2030–2050) climate change will cause an additional 48 000 deaths per year from diarrhoea (WHO, 2015).

The effects of climate change on agricultural production and food security are not expected to be uniform across the globe. In low-latitude countries, crop production will be consistently and negatively affected by climate change, while in northern latitudes, the impacts on production are more uncertain; there may be positive or negative consequences (Porter *et al*., 2014). Increases in the frequency and severity of extreme climate events, such as heat waves, droughts, floods, tropical storms and wildfires, will have greater consequences for agricultural production and food insecurity than higher temperatures and more erratic rainfall (IPCC, 2007), as higher temperatures can in some situations improve crop growth (FAO, 2016b). Overall, in low and middle-income countries a substantial negative impact is expected on per capita calorie availability, childhood undernutrition and child deaths related to undernutrition (Porter *et al*., 2014).

Climate change exacerbates gender inequalities.

Women farmers make up more than half of the agricultural workforce in some low and middle-income countries, but are disadvantaged with fewer endowments, entitlements, and limited access to information and services. The development of inclusive agri-food value chains represents an opportunity for women, however, the benefits can only be accrued if existing inequalities are addressed at all stages in value chains.

Climate-smart agricultural practices promise substantial improvements to food and nutrition security under climate change.

Climate change has various detrimental effects on agricultural systems and hence food and nutrition security. To respond to these effects, climate-smart agriculture (CSA) aims to sustainably increase food and nutrition security and incomes, and adapt and build resilience to climate change, while capturing potential mitigation co-benefits (FAO, 2010). It addresses the interlinked challenges of food security, poverty and climate change through the sustainable use of ecosystems and their services. Two integral elements of CSA are sustainable agriculture and Ecosystem-based Adaptation (EbA).

Sustainable agriculture strengthens the conservation, restoration or management of biodiversity, ecosystems and ecosystem services, while improving the ability of crops and livestock to maintain crop yields under climate change. The adoption of sustainable practices by smallholder producers is crucial to improving food security. However, in order to encourage adoption, improvements will also be necessary in infrastructure, extension, climate information, access to credit and social insurance – conditions which are at the heart of rural development (FAO, 2016b). In many cases, impoverished, food-insecure farmers, pastoralists and fishers simply may not have the assets required to make significant changes in their production methods. Overcoming these barriers to adoption requires effective social protection systems, which are already in place in more than 100 countries and have become an important instrument for reducing hunger. It is estimated that they have prevented 150 million people worldwide from falling into extreme poverty (Fiszbein, Kanbur and Yemtsov, 2014).

The EbA addresses the crucial links between climate change, biodiversity, ecosystem services and sustainable resource management. It improves ecosystem health by strengthening resilience to climate change and reversing the widespread degradation of agriculture's natural resource base – from soil to forests to fisheries – which threatens the very sustainability of food production. It works to achieve this through the diversification of sources of economic growth, including a strengthened agriculture sector that works with, rather than against, nature. EbAs and sustainable natural resource management (NRM) practices together will mitigate the effects of climate change through improved carbon storage and reduced GHG emissions from agriculture. In terms of food and nutrition security, EbA practices will strengthen the ecosystem services that underpin agricultural productivity and resilient food production. They will provide multiple benefits, including sustainable food production and water availability, enhanced buffering capacities against extreme weather events (i.e. floods, droughts, landslides, etc.) and climate change mitigation co-benefits (Colls, Ash and Ikkala, 2009).

Potential effects of climate change in the ECO region

Central Asia sub-region: Central Asia is expected to become warmer in the coming decades and increasingly arid. Shrinkage of glaciers in Central Asia is predicted to increase as a result of climate warming, which will influence downstream river runoff in these regions. Recent studies show that cooler parts of the sub-region could benefit from warmer winters, a longer growing season and an increase in arable areas, whereas in other areas, particularly western Turkmenistan and Uzbekistan, frequent droughts could negatively affect cotton production and increase already high water demands for irrigation. Growing demand for water is also driven by urbanization and population growth, and adequate water supply will be a major challenge in the sub-region. Considering the dependence of agriculture on irrigation in Central Asia, climate change will strongly affect food security in these countries.

West Asia sub-region: Three countries in the West Asia sub-region (Afghanistan, Iran and Pakistan) are among the twenty countries most vulnerable to the impacts of climate change globally, according to the Global Climate Risk Index 2019.[3] All three countries have been affected by recurrent climate-induced natural disasters, with recent years witnessing an increase in the frequency of such disasters. This will lead in many cases to indirect impacts such as soil erosion and reduced water supply, which could increase the risk of food security. As with Central Asia, the production system of the three countries in the sub-region is reliant on irrigation, which accounts for a significant portion of the available water sources. The rate of urbanization and population growth is particularly high in Afghanistan and Pakistan which will further increase water demands.

3 Germanwatch (2018).

PART 5

Part 5. Considerations for the ECO Regional Food Security Programme

Summary of the overview of food security in ECO

Overall, the review of developments in food and nutrition security in the ECO region indicates that significant progress has been made in all of the dimensions of food security during the period 2000–2017. Improvements are apparent in food availability, access to food and food utilization in healthy food consumption environments, alongside positive impacts on outcome indicators, including the PoU and nutrition indicators (stunting, wasting, overweight, obesity).

However, recent developments in the region underline the conviction that food security in the region is still under threat from multiple dimensions. Political instability and conflicts in Afghanistan and Pakistan, and the large influx of refugees from Syria to Turkey, risk the success achieved to date, especially in view of the fact that these countries account for 66 percent of the regional population. It is evident that the region has the potential to feed itself, but undermined social protection, low investment in health, potential negative effects of climate change, high rates of urbanization and income inequality can all undermine the economic growth accomplished to date. Agriculture is presently at the cross-section of supply constraints and rising demand for food, while facing severe competition from other sectors for its main inputs – water and land. This may lead to food price hikes and deteriorating access to food among vulnerable populations. Food trade is also constrained by the safety concerns of importing countries in the face of transboundary animal and plant diseases.

Strong political commitment translated into public policies should speed up the response to current threats to food and nutrition security. Political commitment and the integration of the SDGs into national policies would provide a strong basis to address all the dimensions of food security from a cross-sectoral perspective. Such an integrated approach should be based on the following features:

- Food and nutrition insecurity is a multi-factorial problem, and its solution requires a multi-sectoral approach involving the collaboration of multiple actors (public, private, social) from agriculture, environment, health, education and social protection.

- Food and nutrition security policy governance/institutions are necessary to frame national food security policies, and create an enabling environment for effective interactions among the actors involved.

- A twin-track approach to food security – consisting of direct action to immediately tackle food insecurity among the most vulnerable and long-term sustainable agricultural, food and nutrition security programmes to eliminate the root causes of food and nutrition insecurity – offers ways to address the short-term needs of vulnerable populations and ensure long-term sustainability for economic, social and nutritional improvements.

Accordingly, the policy agenda for sustainable food and nutrition security in the ECO region would benefit from considering the following recommendations.

Build a smallholder-inclusive value chain

Ample scope exists for smallholder farmers to benefit from increasing food demand if they are integrated into modern agri-food value chains on an equal footing with large farmers. The obstacles

to smallholder farmer participation in modern value chains generally include low productivity, lack of storage and transportation, and limited access to information as well as financial and investment skills and knowledge. Support may include productivity enhancing technical assistance, the creation of smallholder cooperatives, and the strengthening of collection and storage facilities. Farmer field schools can also help smallholders improve their understanding of the value chain and their niche within its operations. Effort should be made to understand specific opportunities and priorities through value chain analysis.

Agri-food value chains have the potential to link rural and urban sectors, thus paving the way for social, economic and environmental benefits. The creation of off-farm employment opportunities, especially for women and youth, will be a key contribution to the sustainable development of value chains, but there is a need for social, economic and environmental sustainability principles to guide the development process. Only in this way will smallholders and disadvantaged groups of people be integrated into value chains, thus reducing food insecurity in the face of increasing urbanization and changing patterns of food consumption. To achieve sustainable food and nutrition security for all, economic and social sustainability should lead to inclusive growth; economic and environmental sustainability to green growth; and environmental and social sustainability to eco-social progress. Inclusive growth can be achieved if economic impacts (e.g. employment, incomes, profits, food production) and social impacts (e.g. improved income distribution, health and nutrition, animal welfare, conformity with social norms) are sustainable over the long term. Green growth means that economic and environmental impacts (e.g. improved biodiversity and soil conservation, reduced food loss and waste and GHG emissions) reinforce each other over the long term. However, economic progress should not occur at the expense of environmental progress. Similarly, eco-social progress means that environmental and social impacts are sustainable over the long term. Improving social and environmental sustainability can lead to new forms of value creation in food value chains, but also can act as barriers to competition for smallholder farming due to the imposition of higher technological standards. Public support is therefore needed to counteract the technological disadvantages that smallholders face.

Investment in building agri-food chains based on these three principles should create opportunities for smallholders and youth along different stages of the food chains. However, the inclusion of smallholders into food chains is not automatic. They need support in various areas to balance the disadvantages that they face. They need public support in order to access information on agricultural and farming systems, technology, business development skills, credit and institutions minimizing technological barriers that favour large farms. Inclusive value chains must also consider disadvantaged groups, such as women and youth, who usually lack the desired capacities to become part of chain operations. Effective rules and regulations should be implemented to support women and youth to ensure their inclusion in the chain as players. Agricultural policies should consider all these dimensions of sustainability so as to ensure the development of inclusive agri-food value chains that link urban and rural landscapes.

Expand agri-food trade among ECO member countries

There is scope for agri-food trade across ECO countries that share a common culinary culture; however, historically, intra-regional agri-food trade has been limited among ECO member countries. The demand for rice, vegetable oil, meat and dairy is expected to increase and trade of these items within ECO member countries can benefit the food security of both producers and consumers. During the period 2000–2016, the agri-food trade orientation of countries in the ECO region remained

unchanged. The countries in Central Asia continued to trade most with the Russian Federation; Turkey traded most with the European Union, the Mediterranean and North Africa (MENA), the United States, the Russian Federation and Asia; Pakistan traded most with Asia, the European Union, MENA, China and India; and Iran traded most with MENA, the European Union and Asia. Capitalizing on the increasing scope for intra-regional trade requires ECO member countries not only to align their trade policies and priorities, but also to invest in the promotion of agri-food trade in the region. Diversification of trade partners within the ECO region is especially important in terms of stable food security for those members (countries in Central Asia) with very high food imports. Realistically, the creation of intra-regional, agri-food trade opportunities depends the ability of ECO member countries to organize around regional food and nutrition security priorities.

Reduce food losses and waste

Globally, around 1.3 billion tonnes of all food produced is lost or wasted along the food chain from production to consumption, of which about 630 million tonnes is lose or wasted in low and middle-income countries (HLPE, 2014). SDG 12, which aims to ensure sustainable consumption and production patterns, sets out to halve per capita food waste and food losses by 2030.

Food losses and waste in most ECO countries are higher than the global average. Since food losses and waste occur as part of production, distribution and consumption activities, it is critical, first, to understand the underlying causes of food losses and waste in each country; then, second, to quantify the actual losses and wastes incurred; and third, to develop and implement solution-based strategies to reduce the losses at farm, food chain and macro levels (HLPE, 2014, p. 57). Most important of all, exchanging relevant experiences among ECO countries, particularly good practices and innovations, should contribute to the establishment of strategies and mechanisms for reducing food losses and waste. The challenge lies in weighing the economic, social and environmental costs and benefits of different strategies and mechanisms, and in determining the approach that best ensures food security, improves environmental sustainability and strengthens resilience to climate change in ECO countries.

A relationship has been observed between income level and food loss and waste along the food chain (FAO, 2017a). In medium and high-income countries, significant food loss and waste occur early in the food supply chain. In low-income countries, however, food is mainly lost during the early and middle stages of the food supply chain; much less food is wasted at the consumer level. Uncovering such patterns in food loss and waste should support evidence-based informed policy-making processes in ECO countries. It will help both to identify the sources of losses and waste and to design strategies to recover the loss and redistribute the recovered food for final consumption.

Collaborate to manage transboundary animal diseases

Transboundary animal diseases (TADs) pose a serious risk to livestock farming and food and nutrition security and threaten trade in the face of globalization and liberalization. For livestock producers, TADs multiply the risk of loss of livestock and incomes, increasing vulnerability to poverty particularly for small-scale producers. For consumers, the zoonotic potential of TADs and emerging infectious diseases, such as porcine Nipah virus, threatens human health, leading to declining consumer confidence in animal products, which eventually depresses the entire livestock sector.

The livestock sector contributes substantially to the national economies of Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan and Uzbekistan, by providing high-value food, income and employment. The threats from TADs have become more important as a result of the devastating impacts of natural or man-made crises in conflict zones, causing significant outflows of rural/nomadic people to neighbouring countries that disrupt the animal health control mechanisms put in place by the host governments. Furthermore, growth in populations and the availability of fat supplies in ECO member countries underline the potential transformation of livestock farming and natural landscapes, underscoring the potential benefits from investing in an enabling environment for animal health services. The strengthening of national regulatory systems in collaboration with international monitoring and surveillance organizations is therefore necessary to prevent and respond effectively to the emergence of new outbreaks.

The socio-economic burden of TADs is high and cannot be remedied by the efforts of a single country alone. It calls for collaboration to prevent and monitor the situation at the regional as well as the global level. For ECO countries, participation in international action is crucial to tackling TADs at the source. It is especially critical for countries where livestock farming contributes substantially to economic growth. In the context of globalization and liberalization, countries exporting animal products are concerned with maintaining or expanding their market shares, while importing countries are concerned with protecting their domestic livestock populations. Those countries that have the ability to meet and demonstrate adherence to international standards regarding TADs would increase their competitiveness in the regional and international markets for livestock, commodities and products of animal origin.

Strengthen social protection for the most vulnerable to ensure their access to a nutritious diet

While all ECO member countries have made significant progress in increasing food availability and incomes, vulnerable populations such as those living on the food poverty line, refugees and IDPs are still at risk of food insecurity. These groups tend to have limited options for building reliable and sustainable livelihoods for a variety of reasons. However, the basis of their livelihoods, particularly their human capital, can be strengthened through national social protection schemes, such as skills development training and farmers schools.

SDG 1 aims to achieve the implementation of nationally appropriate social protection systems and measures for all, including floors, and by 2030 attain substantial coverage of the poor and the vulnerable. In ECO countries, social safety net programmes cover a broad range of services that the poor and vulnerable need for improved access to nutritious food, including cash transfers, in-kind food transfers, school feeding, other social assistance programmes and public works programmes (cash for work and food for work).

The integration of social protection into national development strategies underlines the commitment of governments to ensuring sustainable development. Institutional arrangements and collaboration with all stakeholders are the basis for the establishment of an improved social safety net delivery targeting the most vulnerable. To enhance human capital (through health, education and livelihoods) and national development, social safety nets programmes should target the poor, alleviate the impacts of human-made and natural disasters, and ensure the rehabilitation and integration of people with disabilities, refugees, IDPs, female victims of abuse and homeless people.

In the context of sustainable development, there is a need to integrate a social safety net into the

national development agenda rather than loosely defining it as a public support programme. In ECO countries, social protection institutions and structures exist, but social protection policies operate more like social support programmes with a limited time period. Therefore, public resources allocated for social protection do not represent a significant share of total public spending, implying a low level of political commitment. Public social spending across the OECD, for example, amounts to 20 percent of GDP on average, estimated for 2018. As of 2016, public social spending in Turkey was 12 percent of GDP, the highest rate among ECO countries.

Support the diversification of diets

Rising incomes and increasing urbanization lead to dietary changes, notably the consumption of more processed food with a higher fat and sugar content. Conventional food supply chains often provide food that has a high calorie intake but is low in nutritional content, resulting in many people in urban areas consuming foods that are poor in the nutrients needed for health and a productive life. This can lead to further increases in overnutrition and micronutrient deficiencies, which in turn cause a heavy socio-economic burden through diet-related diseases. The solution lies in diversified agricultural production and improved access to nutrient-rich food, while advocating (especially among urban groups who are not familiar with nutrient-rich foods) for better understanding of the role of nutrition in preventing diet-related health problems. However, protecting the diet quality of the poor in the face of climate-related supply shocks and growing food demand due to urbanization is a challenge, underlying the need for targeted social protection.

The broad elements of a dietary diversification strategy consist of the promotion of mixed cropping and integrated farming systems, and a wider variety of food crops, the integration of nutrition objectives into farming systems, and nutrition-based education to encourage the consumption of a healthy and nutritious diet year round. To achieve dietary diversification, a large number of actors should be organized around a common goal – the diversification of food consumption for a healthy life. These actors include government agencies through extension services, agricultural banks, farmer groups, fertilizer and seed companies, food industries and other private sector agencies who may wish to profit from policies for food diversification. On the consumer side, diversification of food consumption is a matter of having sufficient income and knowledge of the effects of quality diets on health. On the producer side, it is a matter of ensuring efficient food production, effective demand and marketing. Achieving sustainable food and nutrition security thus requires the design and implementation of agricultural diversification policies that address both the needs of consumers and the expectations of producers.

References

Colls, A., Ash, N. & Ikkala, N. 2009. *Ecosystem-based adaptation: A natural response to climate change*. Gland, Switzerland, IUCN (available at https://portals.iucn.org/library/sites/library/files/documents/2009-049.pdf).

FAO. 2010. *Sourcebook on climate-smart agriculture, forestry and fisheries* (available at www.fao.org/3/a-i3325e.pdf).

FAO. 2013a. *The state of food insecurity in the world: The multiple dimensions of food security.* Rome.

FAO. 2013b. *The state of food and agriculture. Food systems for better nutrition*. Rome.

FAO. 2013c. *Food losses and waste in Turkey: Country report*, by F.F. Tatlıdil, İ. Dellal & Z. Bayramoğlu. Budapest (available at www.fao.org/3/a-au824e.pdf).

FAO. 2015. *Climate change and food systems: Global assessments and implications for food security and trade*. Rome.

FAO. 2016a. *Climate change and food security: Risks and responses*. Rome.

FAO. 2016b. *The state of food and agriculture: Climate change, agriculture and food security*. Rome (available at www.fao.org/3/a-i6030e.pdf).

FAO. 2016c. *Food and agriculture: Driving action across the 2030 Agenda for Sustainable Development*. Rome (available at www.fao.org/3/a-i7454e.pdf).

FAO 2016d. *The state of agricultural commodity markets in depth. Food self-sufficiency and international trade: A false dichotomy?* Rome (available at www.fao.org/3/a-i5222e.pdf).

FAO. 2017a. *The state of food security and nutrition in Europe and Central Asia*. Budapest (available at www.fao.org/3/I8194EN/i8194en.pdf).

FAO. 2017b. *The future of food and agriculture: Trends and challenges.* Rome (available at www.fao.org/3/a-i6583e.pdf).

FAO. n.d. Food security statistics (last updated 11 September 2018) (available at www.fao.org/economic/ess/ess-fs/ess-fadata/en/#.XJ390pgzaUk).

FAO & European Union. 2017. *Strengthening sector policies for better food security and nutrition* (available at www.fao.org/3/a-i7214e.pdf). Rome, FAO.

Germanwatch. 2018. *Global Climate Risk Index 2018: Who Suffers Most From Extreme Weather Events? Weather-related Loss Events in 2016 and 1997 to 2016.* Berlin (available at https://germanwatch.org/sites/germanwatch.org/files/publication/20432.pdf)

Fiszbein, A., Kanbur, R. & Yemtsov, R. 2014. Social protection and poverty reduction: Global patterns and some targets. *World Development*, 61: 167–177.

HLPE. 2014. *Food losses and waste in the context of sustainable food systems.* A report by the High Level Panel of Experts (HLPE) on Food Security and Nutrition of the Committee on World Food Security. Rome (available at www.fao.org/3/a-i3901e.pdf).

ICSU. 2017. *A guide to SDG interactions: From science to implementation*. Paris, International Council

for Science (available at https://council.science/cms/2017/05/SDGs-Guide-to-Interactions.pdf).

IPCC. 2007. *Climate Change (2007): Impacts, adaptation and vulnerability.* Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge, UK and New York, Cambridge University Press (available at www.ipcc.ch/site/assets/uploads/2018/03/ar4_wg2_full_report.pdf).

Porter, J.R., Xie, L., Challinor, A.J., Cochrane, K., Howden, S.M., Iqbal, M.M., Lobell, D.B. & Travasso, M.I. 2014. Food security and food production systems. *In* Intergovernmental Panel on Climate Change (IPCC), ed. *Climate Change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects*, pp. 485–533. Cambridge, UK and New York, Cambridge University Press.

UNICEF. 1990. *Strategy for improved nutrition of children and women in developing countries.* New York, United Nations Children's Fund.

WHO. 2015. *Climate change and health*. Fact sheet. Geneva, World Health Organization (available at www.who.int/news-room/fact-sheets/detail/climate-change-and-health).

WHO. 2018. Malnutrition (available at www.who.int/news-room/fact-sheets/detail/malnutrition).

Data sources

United Nations Sustainable Development Goals Indicators (last updated 21 February 2019). https://unstats.un.org/sdgs/indicators/database

- SDG 2 indicators

Global Health Observatory data repository, WHO (last updated 2017) http://apps.who.int/gho/data/node.main.1095?lang=en

- Government health expenditure/GDP (%)
- Government health expenditure/population
- Private health expenditure/government health expenditure (%)
- Poverty ratio

World Bank Databank

databank.worldbank.org/data/home.aspx

- Urban poverty ratio, Rural poverty ratio
- Extreme poverty
- GINI coefficient as income inequality measure
- Employment in agriculture/Total employment
- Refugees and IDPs (numbers)
- Consumption

FAOSTAT price dataset, FAO (last updated 31 October 2018)

FAOSTAT macro-statistics, FAO (last updated 15 March 2018)

www.fao.org/faostat/en/#data

- Agricultural GDP/agricultural price index (defines real agricultural GDP)
- Real agricultural GDP/rural population (defines rural per capita real agricultural GDP)
- National food price index (FPI)
- Cereals price index in ECO countries
- Agricultural GDP/GDP

FAO Food Security Statistics (last updated 11 September 2018)

www.fao.org/economic/ess/ess-fs/ess-fadata/en/ - .XJ390pgzaUk

- Food security indicators

FAOSTAT trade dataset, Detailed tradematrix, FAO (last updated 12 November 2018)

www.fao.org/faostat/en/ - data/TM

- Trade matrix

FAOSTAT Production dataset, FAO (last updated 18 January 2019)

www.fao.org/faostat/en/ - data/QC

- Production and yield

FAOSTAT trade dataset, FAO (last updated 27 June 2018)

www.fao.org/faostat/en/#data/TP

- Import and export

FAOSTAT Food Balance Sheets, FAO (last updated 12 December 2017)

www.fao.org/faostat/en/#data/FBS

- Loses

UNHCR (United Nations Refugee Agency), extracted 5 March 2019

http://popstats.unhcr.org/en/time_series

- Internally displaced persons (IDPs)

This publication has been developed under the project "ECO Regional Coordination Centre for Food Security (RCC-FS)" (GCP/RER/044/TUR) funded by the Ministry of Agriculture and Forestry of the Republic of Turkey through the FAO-Turkey Partnership Programme (FTPP).

REPUBLIC OF TÜRKİYE
MINISTRY OF AGRICULTURE AND FORESTRY

FAO Subregional Office for Central Asia
İvedik Caddesi No:55
06170 Yenimahalle/Ankara-TURKEY
Phone : +90 312 307 95 00
e-mail: FAO-TR@fao.org