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Analyzing Food Security Issues in the ECO Region

3RD MILESTONE REPORT

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List of Acronyms

ADB	Asian Development Bank
ADER	Average Dietary Energy Requirement
ADES	Average Dietary Energy Supply
ADESA	Average Dietary Energy Supply Adequacy
ARMA	Auto Regressive Moving Average
AVFP	Average Value of Food Production
AZN	Azerbaijan New Manat
CGE	Computable General Equilibrium
DPT	Diphtheria, Pertussis, Tetanus
ECO	Economic Cooperation Organization
FAO	Food and Aid Organization of the United Nations
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
ISI	Import Substitution Industrialization
LIFDC	Low-Income Food-Deficit Countries
MDG	Millenium Development Goals
OECD	Organization of Economic Cooperation and Development
PIDE	Pakistan Institute of Development Economics
PPP	Purchasing Power Parity
SDG	Sustainable Development Goal
USD	United States Dollar
USSR	Union of Soviet Socialist Republics
WFS	World Food Summit
WTO	World Trade Organization

Executive Summary

This project report analyzes the issue of food security in the ECO region and identifies the factors that influence the food security situation in the ECO member countries. The report also discusses implications of global price shocks on food security within the region and strategies for ensuring food security and reducing hunger and malnutrition in the region.

The locus of hunger and malnourishment within the region, as per criterion of non-fulfillment of MDG and WFS hunger targets, is primarily in three countries: Afghanistan, Pakistan and Tajikistan. These have been categorized as the high food deficit area of the region. Hence to eradicate undernourishment and malnourishment from ECO region require deep policy focus on these three countries primarily because of increasing incidence of undernourishment within their population and reduction of undernourished population to insignificant levels in rest of the seven countries that have been categorized as low food deficit countries.

The countries which are categorized as hunger free or low food deficit countries in the region can be grouped into one of three categories; those that maintained level of undernourished below 5 percent since 1990-92 (Turkey and Kazakhstan), those that were able to meet the MDG 1C target by 2015 (Iran and Uzbekistan), and those that fulfilled both MDG 1C and WFS criterion in 2015 (Azerbaijan, Kyrgyzstan and Turkmenistan).

Hunger and malnourishment within Afghanistan, Pakistan and Tajikistan is more a problem of access to food for the poor and vulnerable groups than it is one of availability. This can be inferred from the fact that these countries have high level of undernourishment both in terms of size of the undernourished population and its prevalence rate while there is adequacy of food supply. Probable factors responsible for lack of access include poor distribution and low purchasing power of the poor and vulnerable.

In the context of food access, the countries that have successfully fulfilled their MDGs have on average relatively more pro-poor growth processes than those that could not meet these targets by 2015. This emphasizes not only the fundamental role of poverty alleviation policy efforts in tackling hunger issues, but also reinforce the recognized pathway within MDG 1a and 1c targets, that there is a link between reduction of extreme poverty and reduction in hunger incidence. However, another pattern that emerges is that the degree of hunger reduction is much more responsive to poverty eradication in low than high food deficit countries. Therefore, it is important to go beyond the mere connection between reduction in extreme poverty and hunger alleviation to structural differences within society and an inclusive and sustainable growth mechanism.

Regarding targeted policy analysis in ensuring food security within the region, not only have the low food deficit countries that have been successful in controlling undernourishment within their population to negligible levels as per MDG 1c target, but they have progressed in the fight against chronic hunger. Not only are average percentages of children with wasted, stunted and under-weight growth in low food deficit area

comparatively less than high food deficit area, but there is also a higher rate of decrease and hence progress within these countries towards SDG hunger targets. However, obesity and stunted growth remain a problem for countries within the low food deficit area. Therefore, there is a need to have proactive policy focus to counter such tendencies.

All countries (except for few anomalies) are investing in their food base to secure the domestic food supply especially in terms of staple food and non-staple food items like vegetables and fruits, roots and tubers, meat, livestock and milk products. This is evident in the growth patterns since 2000 in all these food items within aggregation into low and high food deficit areas.

However, in the context of self-sufficiency and diversification food policy, we find that countries in the low food deficit area are on average following a policy of food diversification by relying on global markets for their cereal requirements and developing themselves as supplier of fruits and vegetable, whereas the reverse pattern is observed for high food deficit area countries. Such aggregation may mask country specific policy focus. In the context of country specific patterns, the report finds that overall within two countries (Kazakhstan and Turkey) evidence contrary to aggregate trends is observed as these two countries clearly practice food independence in meeting their home cereal requirements. Turkey is unique in being able to deliver self-sufficiency in staple food requirement while also achieving status as a strong exporter of both fruits and vegetable and cereal in the world market. In Pakistan a policy of self-sufficiency in cereal is evident, while in Afghanistan and Tajikistan, contrary to their traditional focus of food

independence policy, there is evidence of dependence on global markets for meeting cereal needs.

In the context of diversification away from cereal, roots and tubers towards food that are rich in protein, except for Afghanistan the pattern is evident in all countries, with the rate of decline being much higher in countries that have met the MDG 1C and WFS targets. There is clear increase in supply of protein products (both animal origin or otherwise) and this increase is again at a much faster rate among countries which have met their MDG 1C hunger target.

In terms of response of countries to this changing dietary preference, at aggregate level countries in the high food deficit area have an advantage in meat and fish production with positive and substantially higher trade surpluses. However, at a disaggregated level, it appears that except for Turkey and Pakistan, the other countries are not yet secure in meeting their own local demand.

As a prime policy target of how a country can be protected from plausible international price shock as that have happened in recent past in 2007-08 and 2010-11, within our discussion through evaluation of food prices (actual and forecasted values), extent of cereal important dependency and status of stock of foreign reserves the report has attempted to identify which countries are at risk in their food security in the event of a price hike emanating from international markets.

Four countries are found to be totally at risk of being affected greatly by international price shocks; namely, Afghanistan, Kyrgyzstan, Pakistan, and Tajikistan. The countries that appear secure in all dimensions and not responsive to price shocks are Turkey and Iran. The evidence suggests that Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan are potentially at some risk, but the extent of such possibility is observed to be much less that the four countries totally at risk.

There are policy lessons to be learned from the low food deficit countries regarding their successful attempts at removing hunger from within their borders. To be specific it is important to analyze in greater depth the policy processes through which these countries are showing evidence of greater food security, achieving nutrition targets and relatively more stability not only in domestic food generation processes but also in form of less vulnerability to external shocks.

The agricultural sector has been found to be more productive in low food deficit ECO countries than in countries which could not eliminate hunger from their boundaries. The agriculture sector and rural development are clearly an important piece of the puzzle of putting an economy in the hunger free domain.

In terms of demographic dynamics, a key to success in low food deficit area is that population growth rates have been lowered substantially. Population control is an important aspect in ensuring food security within an economy that needs to be highlighted especially in Afghanistan and Pakistan - the two high food deficit countries that have

substantially high population growth rates along with rising population of undernourished population. Not only are poverty levels relatively higher in high food deficit area, but poverty is also centered in the rural areas, while agriculture sector is a major employer of labor. Within these countries poverty and hunger eradication cannot move forward positively unless the rural economy is strengthened.

Finally, not only have countries in the low food deficit area on average performed well in terms of eradicating hunger, but also in terms of their better overall performance of the agriculture sector and macroeconomic indicators. The policies followed within these countries were not just centered on hunger elimination through pro-poor strategies, but such an end was achieved in the face of well-rounded and comprehensive structural programs designed to improve and sustain overall internal economic stability. This highlights a holistic approach to tackling food security situation in the ECO region focusing on agricultural productivity, a stable macroeconomic environment through prudent monetary, fiscal and exchange rate policies, and regional economic cooperation including agricultural research and extension and measures to boost intra-regional trade and investment.

Chapter 1 - Introduction

Ensuring food security has become a serious challenge for the developing countries including some ECO member states. According to FAO Report 2015 titled 'The State of Food Insecurity in the World', about 795 million people remain undernourished globally meaning thereby that just over one in every nine people in the world are currently unable to consume enough food to conduct an active and healthy life. The more alarming fact is that about 780 million people, 98 percent of the total undernourished population, live in the developing regions.

Comparable with regions of other developing countries, the ECO region also faces the problem of food insecurity; reflected in the very fact that 30 percent of Tajikistan's population is undernourished compared with an average of 13 percent in other developing countries. Furthermore, Afghanistan and Tajikistan are considered to be in a protracted crisis. The situation in Kyrgyzstan is not much different as it faces a food insecurity problem especially with people living in mountainous areas, who have less accessibility and limited agricultural potential.

This study analyzes the food security situation in the ECO region, identifies the factors that influence the food security situation, and discusses implications for regional trade and economic cooperation for ensuring food security and reducing hunger and malnutrition in the region. The analysis provides insights for developing effective strategies to ensure food security of the ECO Region considering the local conditions and perspective with longer-term priorities in view. More specifically, the study presents a

description of the current food security situation in the ECO member states by analyzing the state of food security indicators for the region to provide a comprehensive assessment of the food security situation in the ECO region. The study also identifies factors that influence food security situation in ECO member states.

Against this backdrop, the study has been organized as follows. Chapter 2 presents an overview of food security in a global perspective, and a review of the state of agriculture in the ECO region to provide a context for assessing progress in ensuring food security in the region. Chapter 3 analyzes the dimensions of food security that relate to the region, while a policy perspective on food and nutrition security is given in Chapter 4. Heterogeneities within the ECO region regarding food security issues are discussed in the following chapter, and Chapter 6 reviews food price issues in the region in terms of country responses to food and oil price shocks. Areas of cooperation for ensuring food security in the region are highlighted in Chapter 7, while the country-wise status of food security in the region is recounted in the next chapter, and Chapter 9 concludes the discussion.

Chapter 2 - Food Security Situation

2.1. Introduction

While world population levels are rising rapidly, agricultural food productivity has not witnessed a great surge since the green revolution in the early to mid-20th century thus raising concerns about food security especially in developing economies. Moreover, the environment has been adversely affected by deforestation and excessive cultivation of available land; with the ecological footprint of each individual increasing since the 1970s. Researchers estimate that it currently takes the Earth one and a half year to regenerate what is consumed in one year. These developments have led to serious concern that numerous countries across the world will find it difficult to produce sufficient food to feed their populations, let alone provide access to it. At the World Food Conference in 1974, food security was defined as the "availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices". Over the years this basic definition was expanded to include notions of demand for food and access to food which are also of importance in today's world. In 1996, the World Food Summit defined food security as existing *"when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life"*.

Food security is a global concern, and the global community has taken steps to ensure it is maintained; food security and ending hunger were goals of the UN Millennium Development Goals (2000-15); since superseded by the UN Sustainable Development Goals

in 2016. The anticipated benefits of modern technology are likely to yield a level of food production that is adequate to sustain the world population, but political will and financial investment is needed to alleviate food crises in developing countries. Many determinants of food-security are trans-border and require multilateral agreements and actions for effective solution.

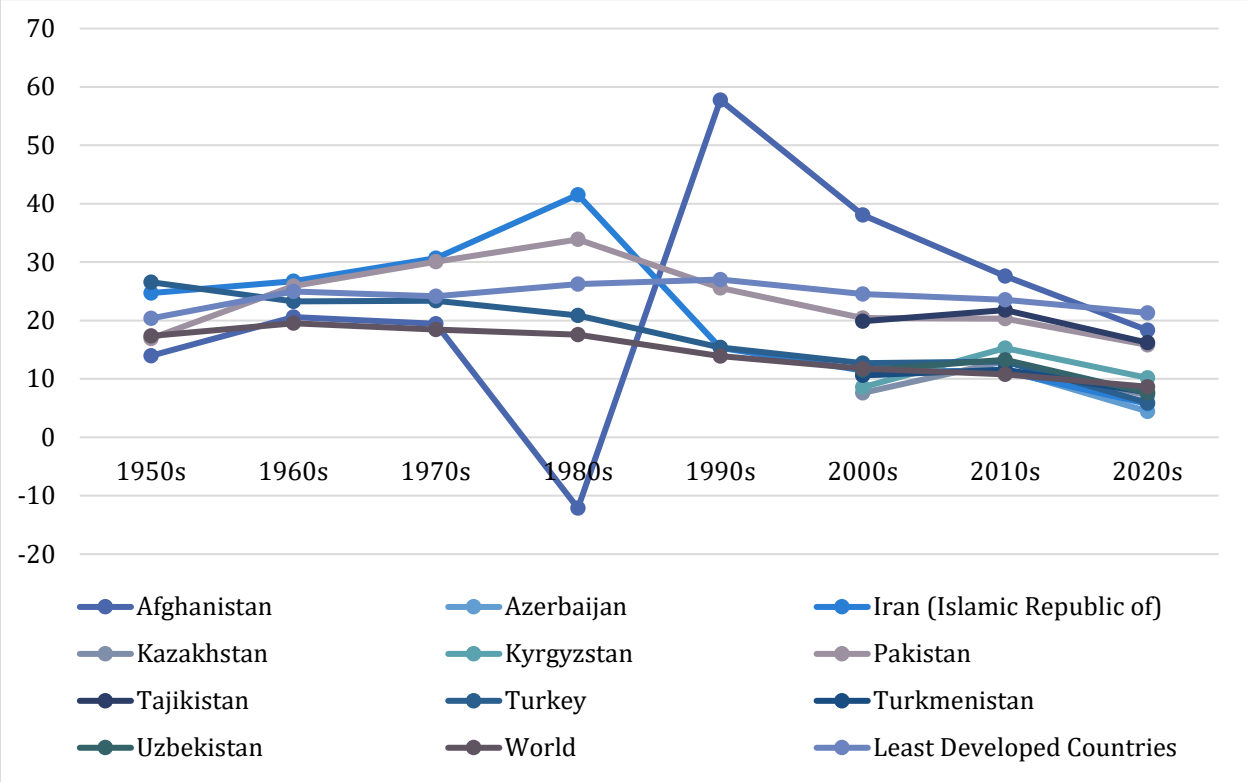
Maintaining food security has remained an important challenge in the ECO member countries and regional Food and Nutrition Security has been an integral part of policy discourse within the ECO region. Among the ten-member states, six were classified as low-income food-deficit countries (LIFDCs) at the start of the new millennium. Therefore, understanding the situation of hunger vulnerabilities within the region and finding policy prescriptions that can ensure a safe, healthy and sustainable supply of food is a prime policy concern. Given that the deadline for fulfilment of Millennium Development goals of 2015 has passed just recently, this affords us an ideal threshold to judge the commitment level within ECO region on the issue of ensuring food security.

This chapter provides an overview of food security situation in ECO member countries with a view to developing a basis for discussion and analysis in the following chapters. To put the analysis into a global perspective, Section 2.2 brings to light the global progress in ensuring food security. Section 2.3 assesses the performance of ECO member countries in ensuring food security. Section 2.4 assesses the performance of the agriculture sectors of ECO member states while section 2.5 concludes the discussion.

2.2. Global Trends in Achieving Food Security for All

According to the FAO, the number of hungry individuals in the world has fallen by over 200 million since 1990-92; given the fact that the world's population has risen from 5.4 billion to 7.4 billion during this same period, this is a commendable achievement in itself. The slowdown in population growth rates is evident in the decade-wise averages for the ECO member countries, which mirror the trends witnessed for developing countries in general and the world as a whole (see Figure 2.1). Despite this progress, however, the number of hungry people in the world in absolute terms is still unacceptably high: at least 805 million people, or one in nine, worldwide do not have enough to eat. Furthermore, global trends in hunger reduction mask disparities within and among regions.

Figure 2.1: Decade-wise Population Growth Rates



Source: FAOSTAT

While Northern Africa has had a consistently low prevalence of hunger at less than 5 percent (Table 2.1), in sub-Saharan Africa, one in four people remain chronically hungry. Reversing this trend is arguably the greatest challenge facing the global community and requires transforming into concrete progress the growing political will in the region exemplified by the commitment to end hunger in the African continent by 2025[1].

The sheer size of Asia makes it a region of extremes: 217 million Asians have overcome hunger since 1990–92; yet it is still the region where two-thirds of the world's hungry live. Significant reductions in global hunger numbers require even greater progress in the region. While the MDG hunger target has already been achieved in Eastern and South-Eastern Asia, hunger prevalence in Southern Asia has declined, though insufficiently, since 1990–92.

Latin America and the Caribbean is the region that has shown the greatest progress in hunger reduction, with the prevalence of hunger reduced by almost two-thirds since the early 1990s. As a whole, it has already reached the MDG hunger target and is very close to meeting the WFS target.

Despite the progress in developing regions as a whole, large differences still remain across regions (Figure 2.2). In general, in Africa, there has been insufficient progress

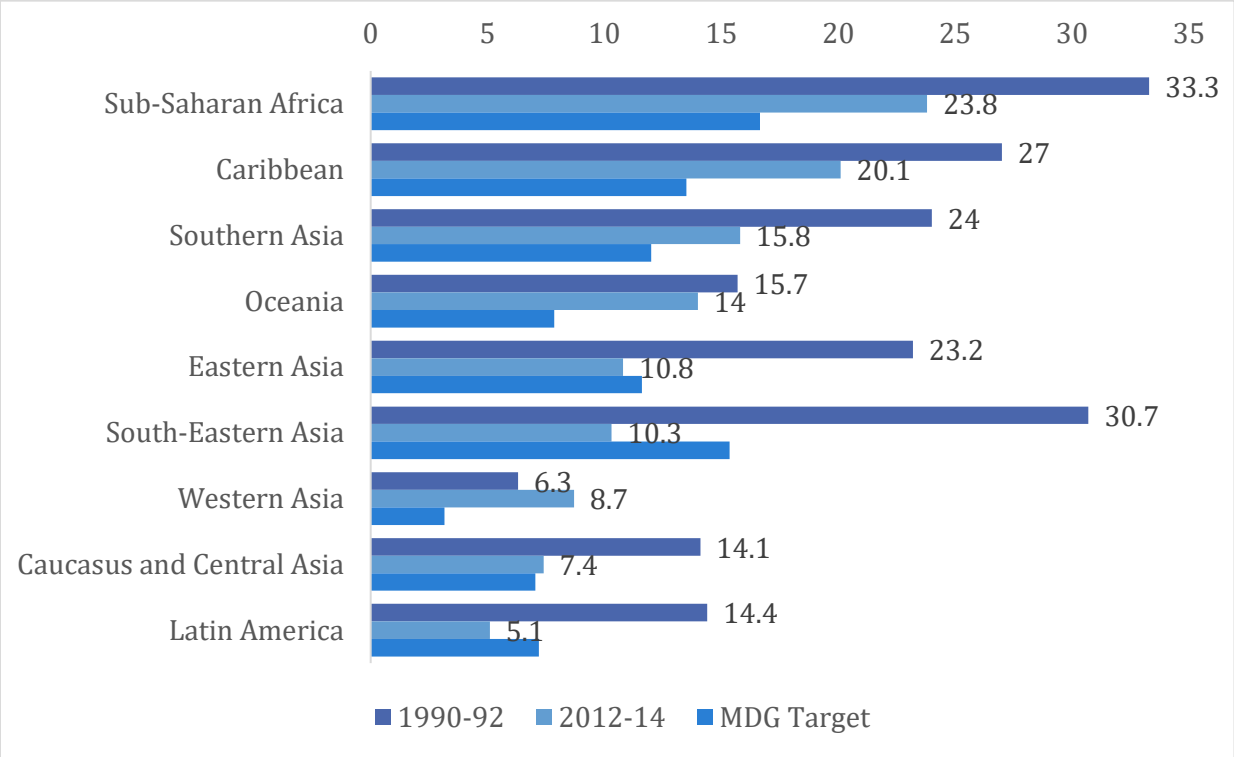
[1] Made at the June 2014 African Union Summit

Table 2.1: Undernourished – Number (millions) and Prevalence (percent)

	1990–92		2000–02		2005–07		2008–10		2012–14*	
	No.	%	No.	%	No.	%	No.	%	No.	%
WORLD	1 014.5	18.7	929.9	14.9	946.2	14.3	840.5	12.1	805.3	11.3
DEVELOPED REGIONS	20.4	<5	21.1	<5	15.4	<5	15.7	<5	14.6	<5
DEVELOPING REGIONS	994.1	23.4	908.7	18.2	930.8	17.3	824.9	14.5	790.7	13.5
Africa	182.1	27.7	209.0	25.2	211.8	22.6	216.8	20.9	226.7	20.5
Northern Africa	6.0	<5	6.5	<5	6.4	<5	5.6	<5	12.6	6.0
Sub-Saharan Africa	176.0	33.3	202.5	29.8	205.3	26.5	211.2	24.4	214.1	23.8
Asia	742.6	23.7	637.5	17.6	668.6	17.4	565.3	14.1	525.6	12.7
Caucasus and Central Asia	9.6	14.1	10.9	15.3	8.5	11.3	7.4	9.5	6.0	7.4
Eastern Asia	295.2	23.2	222.2	16.0	218.4	15.3	185.8	12.7	161.2	10.8
South-Eastern Asia	138.0	30.7	117.7	22.3	103.3	18.3	79.3	13.4	63.5	10.3
Southern Asia	291.7	24.0	272.9	18.5	321.4	20.2	274.5	16.3	276.4	15.8
Western Asia	8.0	6.3	13.8	8.6	17.0	9.3	18.3	9.1	18.5	8.7
Latin America and the Caribbean	68.5	15.3	61.0	11.5	49.2	8.7	41.5	7.0	37.0	6.1
Caribbean	8.1	27.0	8.2	24.4	8.4	23.7	7.6	20.7	7.5	20.1
Latin America	60.3	14.4	52.7	10.7	40.8	7.7	33.9	6.1	29.5	5.1
Oceania	1.0	15.7	1.3	16.5	1.3	15.4	1.3	13.5	1.4	14.0
***Note:* * Projections.**										
Source: FAO.										

towards international hunger targets, especially in the sub-Saharan region, where more than one in four people remain undernourished – the highest prevalence of any region in the world. Nevertheless, the prevalence of undernourishment in sub-Saharan Africa has declined from 33.3 percent in 1990–92 to 23.8 percent in 2012–14. Growing political commitment to promote food security in Africa is being transformed into concrete results. Strong economic growth (7 of the 10 fast-growing economies in the world are in Africa) is improving the living conditions of its growing population.

Figure 2.2: Trends in Undernourishment: 1990-92 to 2012-14



There is greater recognition of the importance of ensuring peace and stability, the lack of which has been both cause and consequence of conflict that risks thwarting efforts to fight hunger in many countries in Africa. The situation is different in Northern Africa,

which has a far lower hunger burden, with the prevalence of undernourishment consistently less than 5 percent since 1990.

The abrupt increase in 2012–14 is due to the addition of the Sudan to the Northern Africa region. Asia as a whole has a prevalence of undernourishment of 12.7 percent, corresponding to 526 million people, or an eighth of the region's population, chronically lacking access to enough food. As the most populous region in the world, Asia is home to two out of three of the world's undernourished people, and overall, it is close to reaching the MDG hunger target, however, significant variations persist across the various sub-regions.

Eastern and South-Eastern Asia have already met the target, having cut their undernutrition rates by more than half and more than two-thirds respectively. The Caucasus and Central Asia are also on track to reach the goal by 2015, while lack of progress in Southern and Western Asia makes it unlikely that these regions can achieve the MDG goal.

Hunger continues to take its largest toll in Southern Asia, where population growth is high. The estimate of 276 million chronically undernourished people in 2012–14 is only marginally lower than the number at the beginning of the MDG process. Although the prevalence of undernourishment has declined from 24.0 percent in 1990–92 to 15.8 percent in 2012–14, progress is still too slow to allow Southern Asia to reach the MDG target by 2015. The situation is worse in Western Asia, where the prevalence of

undernourishment actually increased from 6.3 percent in 1990–92 to 8.7 percent in 2012–14, largely owing to political instability and the deterioration in overall economic conditions during recent years.

Progress has been made in achieving reduction in undernourishment levels across almost all regions, but at very different rates

To date, Latin America and the Caribbean – the first region to publicly commit to eradicate hunger by 2025 – has the most successful developing region record in increasing food security. It has already met the MDG target by a comfortable margin and is close to the WFS summit target. Much of the success results from rapid hunger reduction in Latin America, which has reached the WFS target, while the Caribbean has seen slower progress in fighting undernourishment so far. For the region as a whole, the prevalence of undernourishment has declined to 6.1 percent – representing little more than one-third of its hunger burden in the early 1990s.

Of all the developing regions, Oceania currently has the lowest number of undernourished people. However, despite the low overall burden of hunger in the region, this number has increased over the last two decades, while the prevalence of undernourishment has only registered a very modest reduction: estimates place undernourishment at 14.0 percent in 2012–14, only 1.7 percentage points below the level for 1990–92. An additional cause for concern is that rising undernourishment in Oceania

has been accompanied by a growing burden of overweight and obesity, exposing the region to a significant double burden of malnutrition.

2.3. ECO Progress in Ensuring Food Security

The ECO region encompasses approximately half a billion people that may be bounded by a common cultural heritage but are placed in countries with diverse challenges in the fight against hunger and ensuring food security for all. These countries differ from each other not only in their agricultural productivity but also in terms of demographic and economic structures, which suggests the need for a look at individual country performance in terms of hunger eradication from 1990-92 baseline. In the present context this is accomplished by dividing ECO region into the following sub-groups: South Asian ECO countries (Afghanistan, Islamic Republic of Iran and Pakistan), Central Asian ECO countries (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) and remaining ECO countries (Turkey and Azerbaijan). Such divisions are natural because of both locational vicinity but also, as the in case of Central Asian ECO group, due to their common economic and political history.

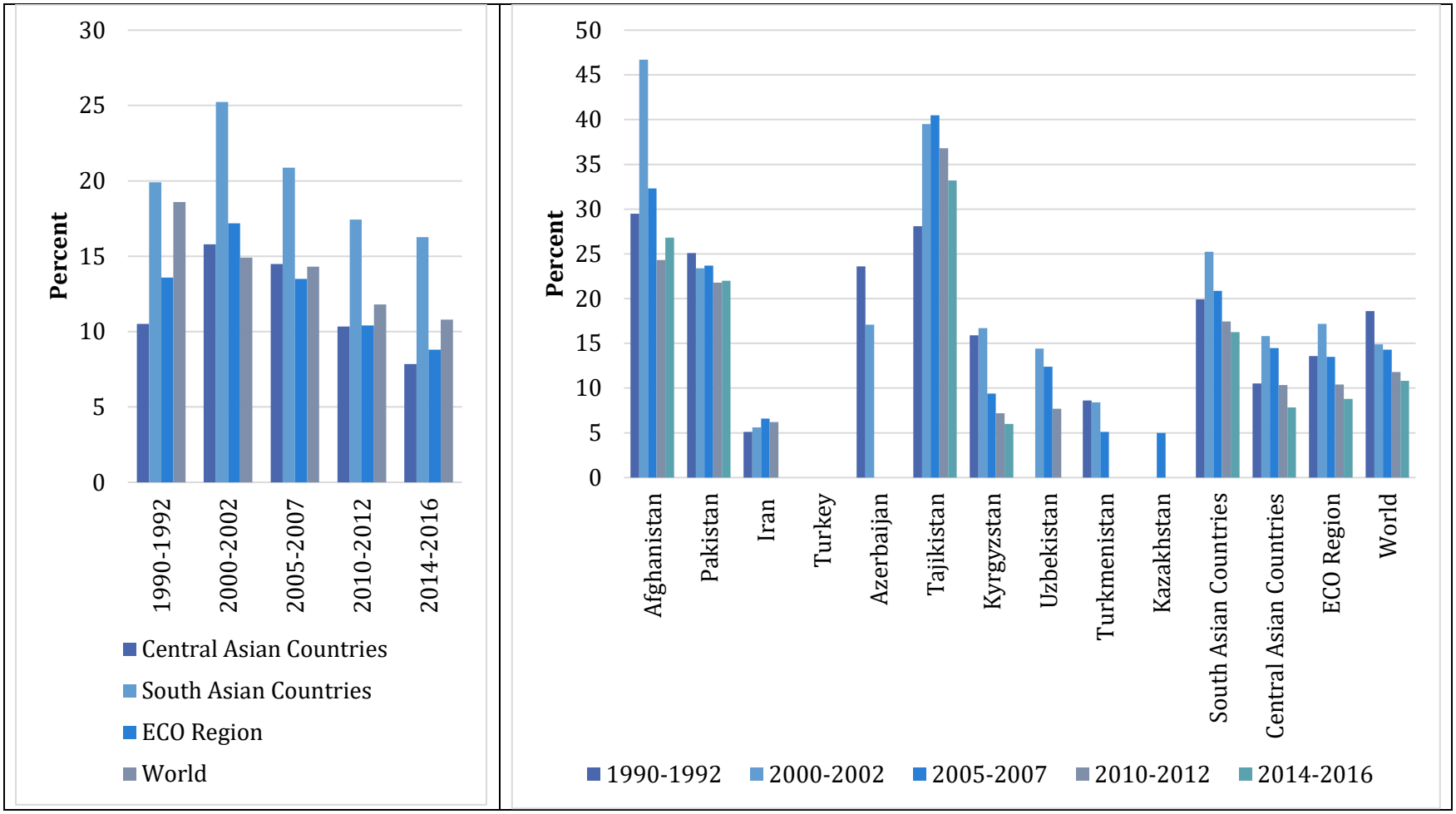
The ECO region is currently home to 464 million people, of which 306 million reside in the South Asian ECO countries alone. Tracing the pattern of prevalence rate of undernourished population rate across South Asian and Central Asian ECO sub-divisions (Figure 2.3), it is evident that the prevalence of undernourished people is higher in the South Asian sub-region as compared with Central Asian ECO sub-region (16.2 percent in

South Asian ECO countries versus 7.84 percent in Central Asian ECO countries; Appendix Table A.3).

Looking into progress made towards achieving the MDG goal of reducing the proportion of undernourished population in total population to half between period 1990 and 2015 or to level of less than 5, we find positive progress in ECO region. There has been an overall reduction in prevalence of undernourishment from the 1990-1992 baseline value, however this reduction falls short by almost 11 percent in meeting the 50 percent reduction benchmark (Appendix Table A.4).

Within the ECO region, there is variation in reduction in the prevalence rate of undernourishment not only between sub-groups but countries as well. The South Asian ECO sub-group again falls behind Central Asian ECO countries, the former having achieved 18.25 percent reduction compared to that of 25.4 percent for the latter (see Appendix Table A.4). In terms of the country-wise dynamics, within the South Asian ECO group, Iran started off with a prevalence rate of 5.1 in 1990-1992 and reduced this to less than 5 in 2014-2016. Pakistan and Afghanistan remain a huge concern with population of undernourished standing at 41.4 million and 8.6 million respectively and reduction rates of 12.3 and 9.15 percent for undernourishment prevalence during the same time period. The Southern Asian sub-group has reduced the prevalence rate of undernourishment from the

Figure 2.3: Prevalence of undernourishment: 1990-92 to 2014-16



Source: FAO (2017)

1990-92 baseline value by 34.4 percent to 18.25 percent[2].

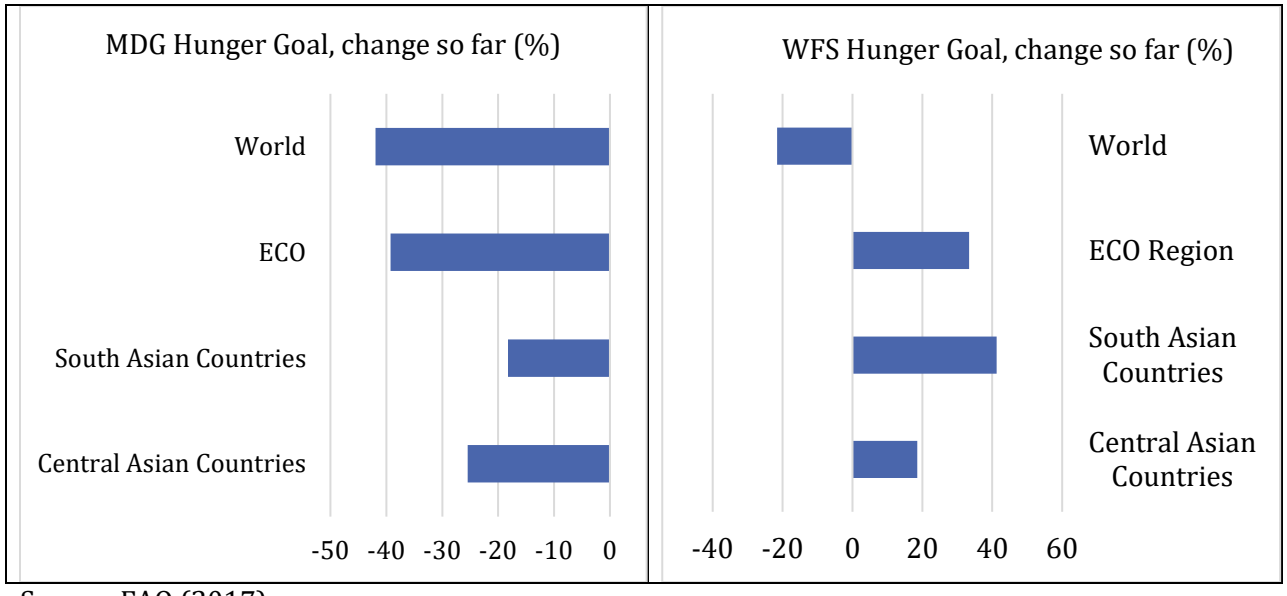
Central Asian ECO Countries show a dismal performance in the early transition period, witnessing a 50 percent increase in undernourishment prevalence rate by 2000-2002. Subsequently the situation stabilized as the process of economic recovery strengthened. Overall, beside Tajikistan, all other countries in Central Asian grouping have done well in achieving the MDG hunger reduction target. Kyrgyzstan, Turkmenistan and Uzbekistan achieved this goal in 2014-2016, while Kazakhstan and Azerbaijan had achieved their goal as early as 2006. Turkey started off with an under 5 prevalence rate in 1990-92 and maintained this level till 2015. Within the Central Asian ECO grouping, the only country which has shown extreme hunger risks is Tajikistan which recorded growth in prevalence rate from 18 percent in 1990-1992. A contributing factor to the extreme situation in the earlier period has been the civil war, which ended in 1997, and the country has started making progress on reducing the prevalence rate from 2005-07 onwards with prevalence rate of 40.5 percent in 2005-07 and 33.2 percent in 2014-2016. This prevalence rate is still quite high by international standards and points to pressing need for active government intervention to ensure food security for its population.

Looking into the dynamic within ECO region and its sub-regions regarding percentage change in proportion of undernourished people in population and in absolute number of undernourished population, there exist discrepancies in performance towards

[2] FAO Regional Overview of Food Insecurity Asia and the Pacific (Page 10, 2015); FAO The State of Food Insecurity in the World (Page 15, 2015)

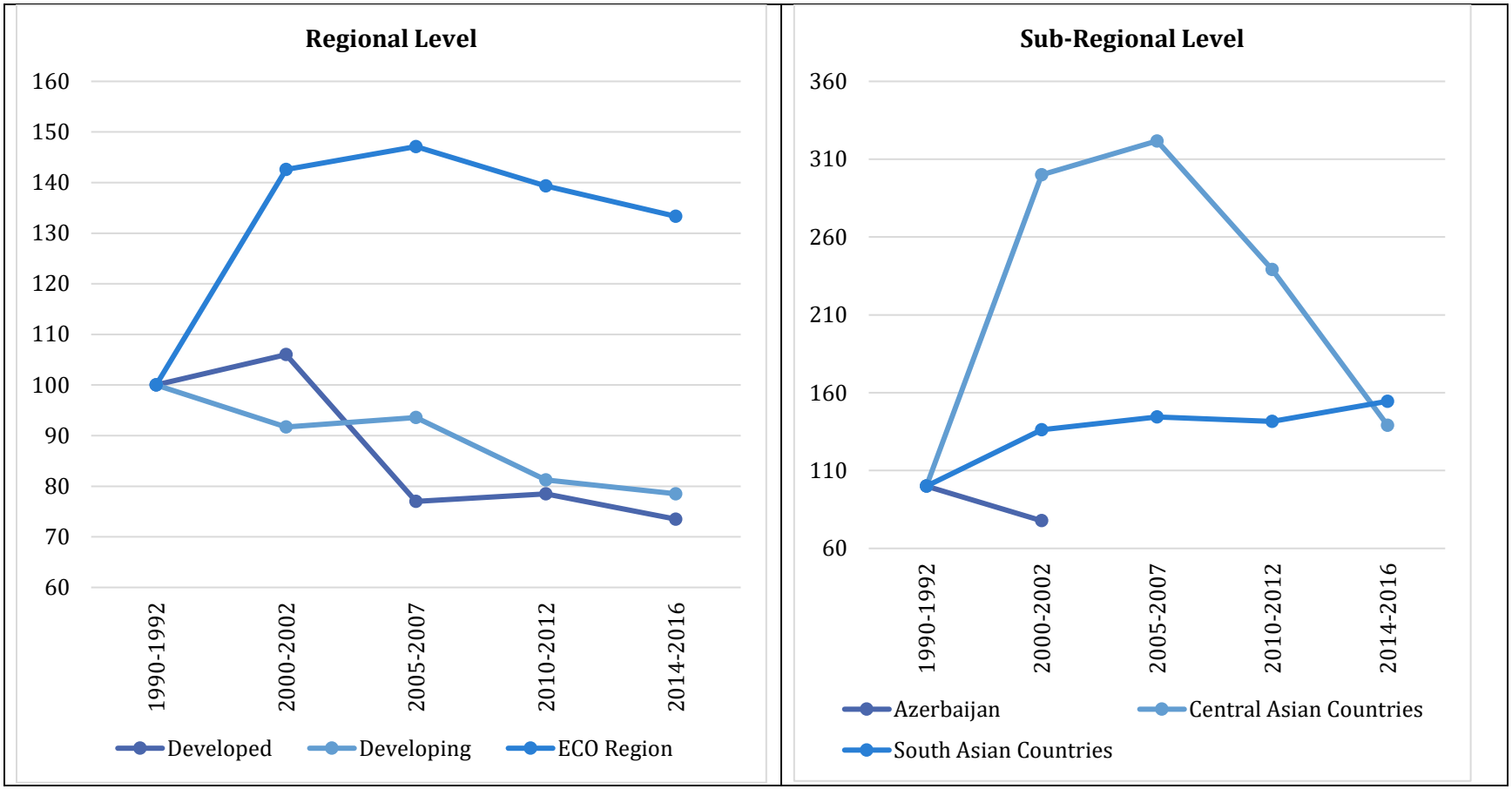
MDG and WFS goals (Figure 2.4). The WFS target is much more stringent as compared to the MDG target as it is invariant to changes in total population. The countries which are showing discrepancy between their progress towards MDG and WFS Hunger goals indicate that within these regions, reduction in prevalence rate of undernourishment as required in MDG target may not be necessarily because of fall in absolute number of undernourished but rather there can be a possibility that these results are driven by growth in population. Specifically, in terms of the growth in population within the region being more than the growth of people who are undernourished. Hence, before coming to any conclusion on food security situation based on prevalence rate of undernourishment (MDG 1C target), it is important to assess the impact of growth in total population on growth of the undernourished population in a country.

Figure 2.4: Progress towards achievement of MDG and WFS Hunger Goals



Source: FAO (2017)

Figure 2.5: Progress toward the WFS hunger target (Index: 1990/92=100)



Source: FAO (2017)

A look at the comparative progress within ECO region towards fulfilment of MDG 1C and WFS hunger targets reveals that in both South Asian and Central Asian ECO countries the progress towards these goals does not match with each other. It is also evident that there is overall positive performance in meeting MDG target, but negative progress in the case of meeting the WFS criterion. Further, from patterns of regional sub-division in Figure 2.5 we can see that growth in number of undernourished people in South Asian ECO countries is showing an increasing trend as compared to Central Asian ECO countries which have not only met the MDGs target but are slowly progressing towards meeting WFS targets. The pattern for Central Asian countries in Figure 2.5 shows that the region experienced high growth in population of undernourished within 1990-2000 transition period. However, post 2005-07 growth in undernourished population started to decrease. The alarming situation is in South Asian ECO countries which do not account for a large portion of the total undernourished population, but the population is also rising over time.

To develop some conclusive understanding of trends within these regions, it is useful to compare hunger patterns country-wise. The countries which are showing growth in size of undernourished population in 2014-2016 from 1990-1992 base period include Afghanistan, Pakistan, and Tajikistan. These have high presence of undernourished people: 41.4 million in Pakistan, 8.6 million in Afghanistan and 2.9 million in Tajikistan[3]. Comparing the performance of these countries in meeting the MDG and WFS hunger targets (Appendix Table A.2 and Appendix Table A.4), we can see that any divergences in

[3] These represent estimates for most recent time frame of 2014-2016.

fulfilment of these two goals in the ECO region are primarily driven by these three countries. For example, in Pakistan and Afghanistan it is seen that proportion of undernourished population from total population reduced at rate of 12.3 percent in Pakistan and 9.15 percent in Afghanistan between 1990-92 and 2014-2016 (hence positive though inadequate performance in terms of the MDG goal). However, if we look at growth in undernourished population then in both these countries there is growth: 44.2 percent in Pakistan and 126.3 percent in Afghanistan; but negative performance in terms of WFS target. In Tajikistan we see growth in both undernourished population size and its proportion from total population (so negative performance in meeting both the targets).

The rest of ECO countries can be divided into three categories[4] (see Table 2.2 below). The patterns from these estimates are consistent with the FAO rankings of countries in terms of performance towards international hunger targets (FAO, IFAD and WFP, 2015; Table 3).

Accordingly, the countries that are most vulnerable in terms of dismal position regarding population exposed to hunger risks as per criterion of non-fulfillment of MDG and WFS hunger target of halving the prevalence rate of undernourishment and absolute number of undernourished people between 1990 and 2015 time-period are Tajikistan, Afghanistan and Pakistan. As a group these three countries have a much higher level of food deficit on average in 2015 amounting to 198.3 kcal/capita/day as oppose to 21.85

4 See Appendix Table A.1 and Appendix Table A.3 for detailed estimates.

kcal/capita/day for all other seven ECO countries taken together (Appendix Table A.5). Furthermore, not only do these countries have higher food deficits on average, but they are also documenting much higher growth in food deficits compared to the remaining ECO countries in the 1990s and a slower reduction rate between 2000 and 2015. Growth rate in depth of food deficit during 1991-2001 and 2001-2015 are 37.14 percent and -23.6 percent respectively for Tajikistan, Afghanistan and Pakistan as a group and 16.62 percent and -66.9 percent for rest as a group (Appendix Table A.6).

Table 2.2: Progress in Meeting MDG Targets - Rest of ECO Members

Category	Country	Characteristic
A	Turkey	maintained level of undernourished below 5 percent since 1990-92
	Kazakhstan	
B	Iran	able to meet the MDG target by 2015 *
	Uzbekistan	
C	Azerbaijan	fulfilled both hunger targets in 2015
	Kyrgyzstan	
	Turkmenistan	

Note: *: Growth in the number of undernourished people is observed in Iran from the base period 1990-92 till 2012-2014, however between 2014 and 2016, Iran was able to reduce the number of undernourished to statistically non-significant numbers and the prevalence rate of undernourishment to under 5 benchmark, hence fulfilling MDG hunger reduction criterion by 2015.

2.4. State of Agriculture in the ECO Region

The performance of the agricultural sector is an important determinant of food security situation. This section provides a brief overview of the state of agriculture sector in the various ECO member countries. This discussion will shed light on the factors that can

have an impact on food security within national boundaries and highlight areas where future collaboration can be useful in achieving goals of better agricultural productivity and food security.

One of main goals of policymakers in Azerbaijan is to diversify the economy, reduce dependence of economy on oil and assure expansion of economic development to rural areas. Agriculture is the third largest productive sector in the economy after oil and construction in terms of value of output, but it accounts for the largest share of employment (in 2006, 39.1 percent of total employed population was working in agriculture, and only 1 percent in the oil sector). Consequently, the performance of the agriculture sector is key to poverty reduction in rural areas. Azerbaijan successfully implemented agrarian reform since 1995 and as a result markets have taken hold in the domestic economy, land and property is utilized effectively, and the structure of the agrarian sector has improved. More importantly, the agriculture sector has gone through fundamental changes including secure property rights on agricultural land, more inclusive distribution of agricultural farms, and adequate provision of technology and equipment. Agricultural production is predominantly done by the private sector: the number of agricultural producers is 1,208.7 thousand units, 99.98 percent of which is comprised of private farms.

Land areas owned and rented by agricultural producers is 2.3242 thousand hectares (69.3 percent family-villager, 11.4 percent housekeeping, and 2 percent farming). Each agricultural producer has 1.92 hectare of land area on average. About 16.0 percent of farms

use mineral fertilizer in cropping while 32.0 percent use organic fertilizer. In comparison with 2005, agricultural production including hunting and forestry increased by 0.9 percent, livestock increased by 2.9 percent, while plant growing declined 0.8 percent due mainly to a reduction in sowing areas (sowing areas of potato decreased 5.4 percent, garden plants 0.5 percent, tea plantations 38.5 percent). Investment in agriculture, hunting and forestry increased 42 percent in comparison with 2005 amounting to 32.3 million AZN (Azerbaijan New Manat).

Though agricultural sector has shown improved performance over the years, key challenges remain in the areas of productivity improvement, access to latest technology, increasing area under cultivation especially in mountains, provision of high quality seeds, and improving access to water. Proper coordination of policies pertaining to production and processing of crops and public investments in agricultural sector are expected to lift agricultural productivity thereby improving food production.

Agriculture sector plays an important role in Iran's economy contributing about a quarter of national output and employing a third of the labor force. There is considerable potential to increase agricultural output in Iran as currently only about 11 percent of the country's total land area of 163.6 million hectares is cultivated. Still 63 percent of the cultivable land has not been used and given the fact that 18.5 million hectares of the present farms are being used with 50 to 60 percent utility, and about one-seventh of the total cultivated land is sufficient to meet domestic demand, Iran could emerge as an important supplier of food in the ECO region. The contribution of agriculture sector to GDP

increased from 21.3 percent in 1991 to 24.5 percent in 2002, indicating the increasingly significant role of this sector in the national economy.

Though Iran exports about 12 percent of its agricultural output, it continues to face various challenges in international markets especially in export of food items including chicken meat. Researchers have found that domestic chicken meat production has been increasing in Iran but the country's total chicken meat production in the Middle East is not stable due to problems in coordination of production policies and competition in the region's market. Besides, trade and production policies have not been conducive to greater exports as these have not enabled domestic producers to take advantage of the growing Middle East market.

Pakistan is a major agricultural producer in the ECO region. The agriculture sector contributes about 24 percent of the gross domestic product (GDP) and employs 47 percent of the national employed labor force. A major part of the agrarian economy depends on farming through production, processing and distribution of major agricultural commodities. Pakistan has a rich and vast natural resource base, covering various ecological and climatic zones; hence the country has great potential for producing all types of food commodities. The total geographical area of Pakistan is 79.6 million hectares and about 27 percent of the area is currently under cultivation. Of this area, 80 percent is irrigated. In this regard, Pakistan has one of the highest proportions of irrigated cropped area in the world. Pakistan is a significant exporter of rice and cotton as well as agro-based raw materials including cotton yarn. The share of primary commodities and processed and

semi-processed products constitute almost 60 percent of total exports. There have been some structural changes over time, but the contribution of agro-based products has more or less sustained its position.

The agriculture sector in Turkey is ranked 7th in the world in terms of production volume. Agricultural output contributes 9 percent of gross value added and absorbs 25 percent of the total labor force. Turkey is endowed with vast fertile land and a climate that is suitable for producing a variety of food and agricultural products. Turkey's total agricultural land is 38 million hectares out of which total cultivated agricultural land (including long life crops such as fruit trees) is 23.8 million hectares. The gross value of Turkey's agricultural production reached USD 62 billion in 2013 according to figures from the Turkish Ministry of Food, Agriculture and Livestock. The strengths of the sector include the size of domestic market, a dynamic private sector economy, and availability of water. Turkey's major agricultural exports include fruits, nuts and vegetables that account for about 60 percent of total agricultural exports. Other significant exports include grains, pulses, oil seeds, flowers, poultry, milk and dairy products. Despite the overall trade deficit of Turkey, the agricultural trade balance is significantly positive, providing cushion to external accounts. The EU accounts for almost half of Turkey's agricultural exports while the EU's market share of Turkey's agricultural imports is also significant, accounting for over of 17 percent of the total.

Uzbekistan's climate conditions along with availability of adequate sources of irrigation water indicate potential for a strong agro-based economy. However, the

agricultural sector lacks diversification and cotton is the main agricultural crop. Uzbekistan is an exporter of cotton which accounts for about 40 percent of the gross value of agricultural production. Due to lack of domestic production, Uzbekistan requires large-scale imports of grain and other foods that are not grown domestically in sufficient quantities.

2.5. Conclusion

This chapter has provided a comparative perspective on food security situation in ECO member countries. It has also provided an overview of the global progress in ensuring food security. The discussion shows that there are large variations in ECO member countries in terms of food security. On the other hand, while significant progress has been made globally to mitigate concerns about food security, there are still challenges to ensure food security especially in developing regions. The agriculture sector is the backbone of the agrarian economy and its productivity can be an important factor in ensuring adequate availability of food. A review of agriculture sector in major ECO economies reveals that while Pakistan, Turkey and Iran have significant agro-based economies, other countries lack a diversified agricultural sector and thus depend on imports of major crops. This situation indicates potential for cooperation among the ECO member countries to ensure food security for their citizens.

Chapter 3 - Beyond Undernourishment: Analysis of Food Security Dimensions

3.1. Introduction

The commitment to fulfillment of First Millennium Development Goal in international and national agenda all over the world has important consequences in policy arena. The MDG 1 goal, by recognizing a close connection between extreme poverty and nutrition and food insecurity, has brought into focus the issue of food inadequacy as primarily a problem of lack of access. There is no doubt that access is a necessary condition in ensuring food security but by no means is it sufficient. There are many more dimensions in food chains of an economy that need to be taken into account such as availability of adequate and stable supply of food within an economy, absorption aspect of diet within the population so as to deal effectively with malnutrition and micronutrient deficiencies, improved access to safe drinking water and sanitation facilities to name a few.

Hence to develop a comprehensive understanding of the condition of food and nutrition status in ECO region and its determinants, it is important to evaluate how countries that have failed to achieve the MDG1C and World Food Summit hunger reduction goals have performed differently from those which have successfully reduced hunger in following four aspects: (i) food availability; (ii) stability or vulnerability; (iii) economic and physical accessibility of food; and (iv) food utilization.

This chapter provides an overview of various dimensions of food security in ECO member countries. Section 3.2 highlights food availability in terms of average dietary energy supply adequacy and average value of food production in ECO member countries. Section 3.3 discusses the issue of food stability while section 3.4 focuses on access to food. Section 3.5 brings to light issues pertaining to utilization of food. Section 3.6 concludes the discussion.

3.2. Food Availability

The availability of an adequate supply of food is the base of the pyramid on which all other pillars of food security rest. To assess the adequacy of food supply within ECO region, we will work with the following two indicators; Average Dietary Energy Supply Adequacy (ADESA)[5] and Average Value of Food Production (AVFP).

Looking into patterns of Average Dietary Energy Supply Adequacy (ADESA) in Figure 3.1, we can see that, on average, countries which have met MDG hunger targets and are characterized as low food deficit countries exhibit much higher values as compared to countries which have not met the international hunger reduction requirements and hence are part of those with high food deficit. Comparing growth in value of food production

[5] Assessment of sufficiency of domestic food supply is extremely crucial in identifying the underlying causes behind food and nutrition insecurity since it may help to understand whether the presence of undernourished population is due to insufficient food supply and/or inadequate distribution of food within economy or are there some other structural factors behind the phenomenon.

across the period 1991-2001, 2001-2011 and 2011-2015[6], we can see that not only is ADESA much higher in countries achieving the hunger targets effectively, but the growth of domestic food production post 2000 is also much higher[7].

Box 3-1: Indicators of Food Availability

Average Dietary Energy Supply Adequacy: *measures dietary energy supply as a percentage of the Average Dietary Energy Requirement (ADER) of the country and provides an estimate of sufficiency of domestic food supply in terms of calories.*

Average Value of Food Production: *measures the total value of annual food production (as estimated by FAO) expressed in international dollars per capita. This provides a cross-country measure that can help in comparison of relative size of food production across countries in dollar per person terms.*

For countries within the low food deficit group ADESA comes out to be 133 percent (higher than 100 percent) implying that average supply of food in terms of calories is 33 percent higher than that required to meet the daily dietary requirement to sustain good health. Also, not only is average dietary energy adequacy greater than average dietary energy requirement (ADER) level within countries in the low food deficit category, but its

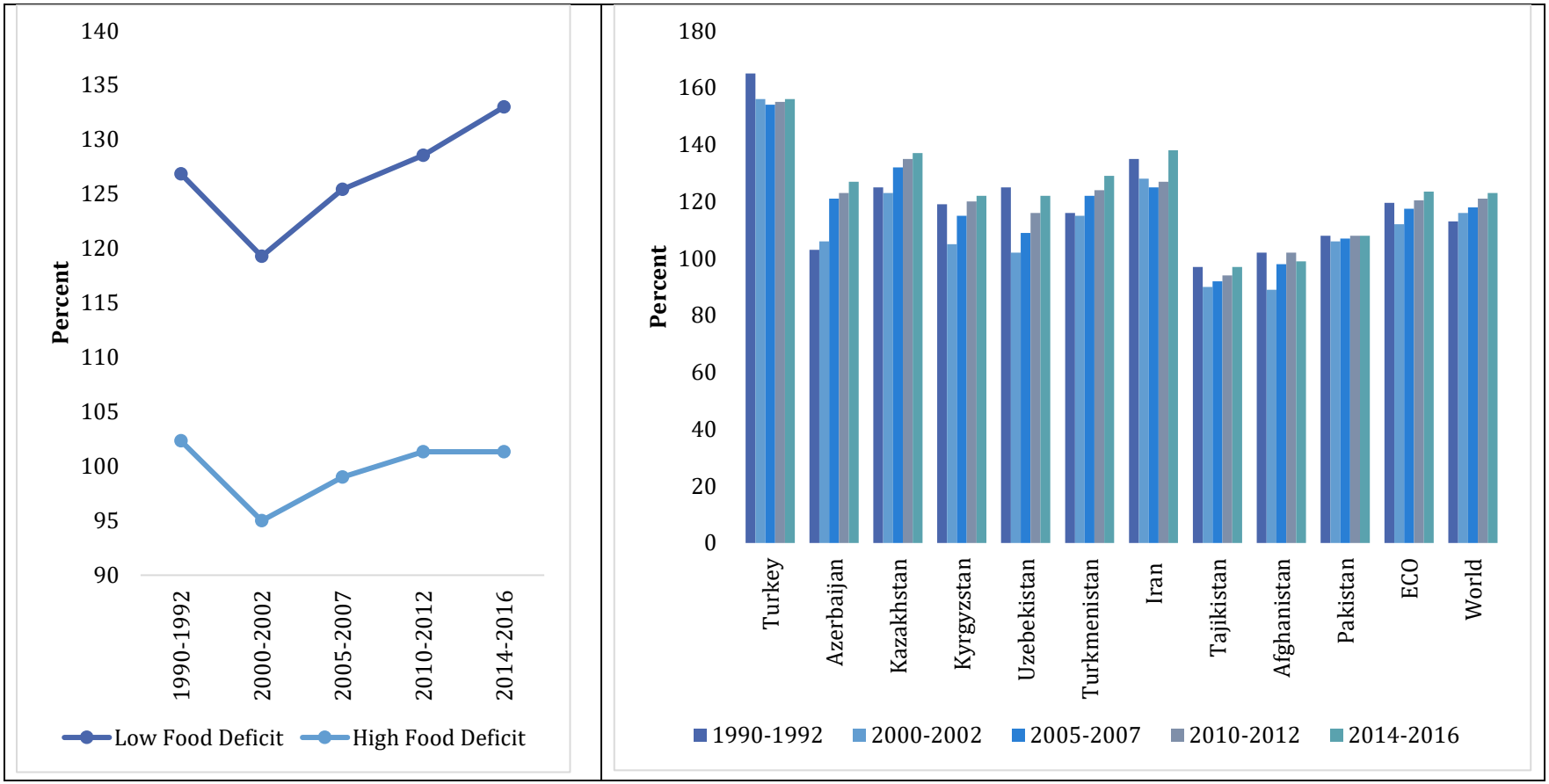
[6]The actual time demarcations as per availability of FAO data are 1990-92 to 2000-02, 2000-02 to 2010-12 and 2010-12 to 2014-16, however for sake of simplification we will consider the midyear in FAO three-year intervals as the base year on which these averages are centered and hence report by this base period.

[7] Growth in value of food production per person for time periods 2001-2011 and 2011-2105 for low food deficit group is 27.2 percent and 2.48 percent respectively and for high food deficit group is 14.6 percent and -1.78 percent respectively.

value is much higher than the world average. Among ECO countries which have been successful in cutting the undernourished population and its prevalence rate from total population to half by 2015 from 1991 base value have ADESA value of 133 as compared with 123 for world in 2015. Finally, a comparison across decades shows a negative trend for the 1991-2001 decade which corresponds to the transitional recession phase for the Central Asian countries. There is a subsequent positive trend after 2000, with growth of 7.7 percent for 2001-11 and 3.4 percent for 2011-15 (Figure 3.1). We can conclude that countries in the low food deficit group have a much higher degree of security in terms of availability of food as compared to countries in the high food deficit groups (Pakistan, Afghanistan and Tajikistan) taken together and these patterns are robust whether we look at it from the perspective of calories or from volume of domestic food production.

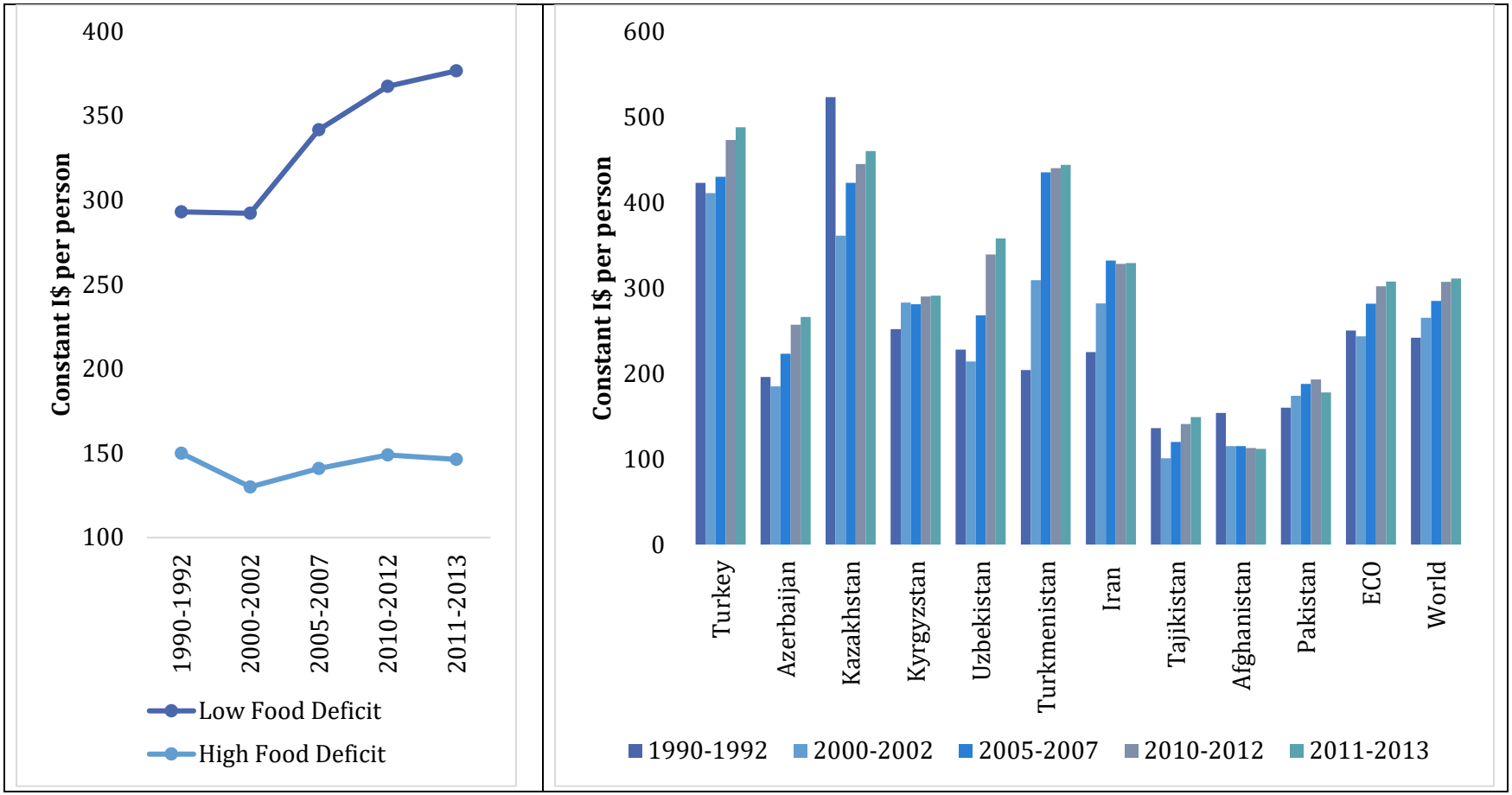
It is also important to note here that all three countries characterized as high food deficit have adequate level of food availability in terms of average calorie supply in proportion to average dietary energy requirement (Figure 3.2). Among these countries in 2015, Afghanistan and Tajikistan have been found to have ADESA value of 99 and 97 respectively indicating that on average dietary energy supply has reached 99 percent and 97 percent of level recommended for healthy life in Afghanistan and Tajikistan respectively, while in Pakistan ADESA value of 108 shows that on average dietary energy supply is 8 percent above its average requirement in the country. Given that all these countries have high level of undernourishment both in terms of size of the undernourished population and also its prevalence rate and given that there is adequacy of food supply within these countries indicate that phenomenon of hunger in these countries is probably

Figure 3.1: Average dietary energy supply adequacy by country: 1990/92 to 2014/16



Source: FAO (2017)

Figure 3.2: Average value of food production by country: 1990/92 to 2011/13



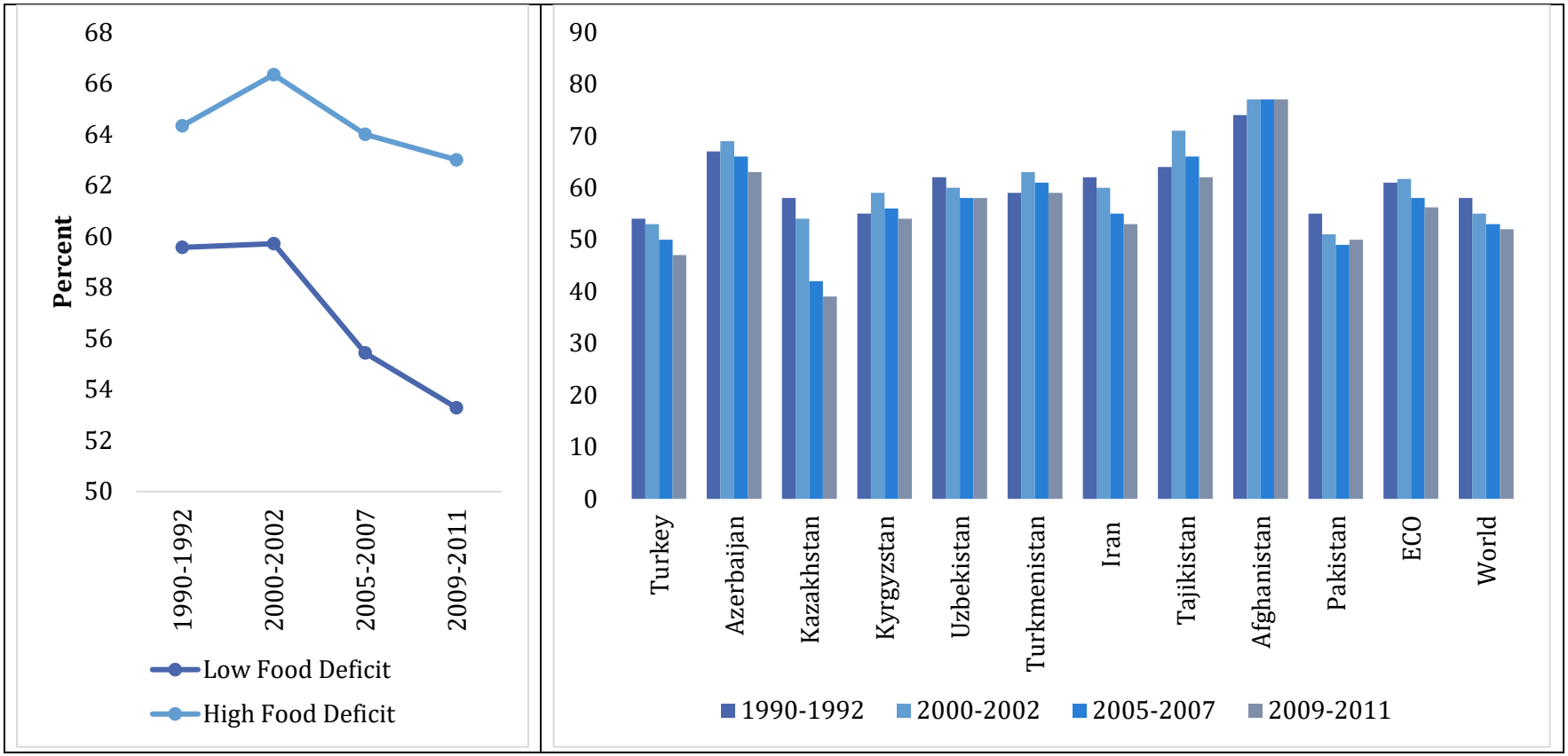
Source: FAO (2017)

not due to insufficient food supply but probably due to bad distribution and problems of access to food for people trapped in extreme poverty. And hence within these countries non-availability of food does not seem to be a constraint to food security but rather food supply is not reaching those most affected from hunger and hence there is a need to develop an inclusive policy. Finally, in Afghanistan, Pakistan and Tajikistan both levels of ADESA[8] and value of food production[9] are below the regional mean value, which points to relative less adequacy of food supply and less value of food production per capita in High Food Deficit grouping compared to other countries. This may also be looked into more detail as a plausible constraint in fulfilment of hunger targets especially in context of low per capita food production for these countries.

Except Afghanistan, the ECO countries are witnessing a shift away from cereals, roots and tubers towards foods that are rich in protein. This trend is more pronounced in countries that have met the MDG 1C and WFS hunger reduction targets (Figure 3.3). Furthermore, there is clear increase in supply of protein products (both animal origin or otherwise) and this increase is at much faster rate among countries which have met hunger target MDG 1C (Figure 3.4, Figure 3.5). This shift in demand patterns away from cereal, roots and tubers and towards protein-rich foods especially those of animal origin indicate growing purchasing power of customers in such economies.

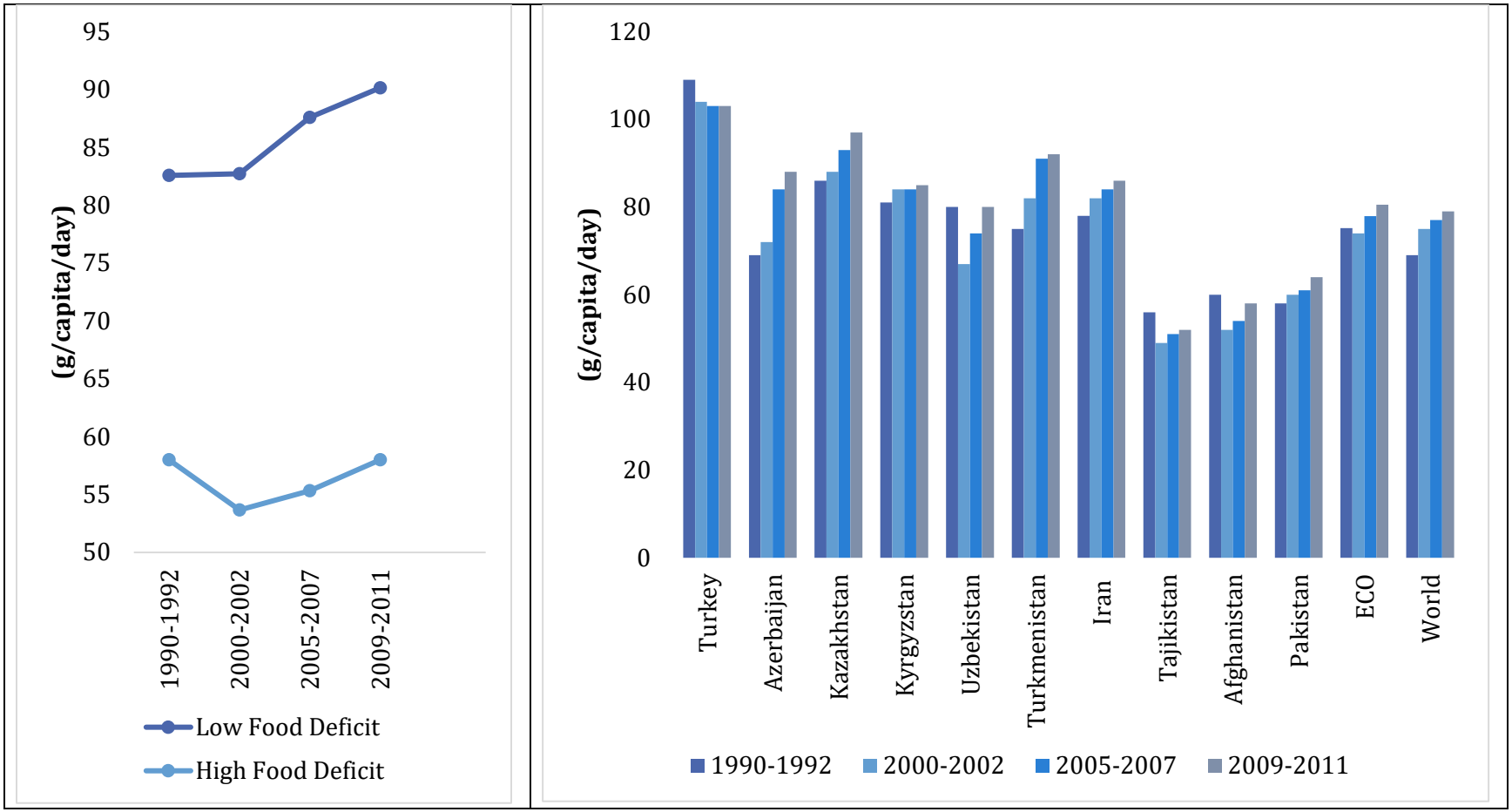
[8] 101.3 for high food deficit group; 123.5 for ECO region in 2014-16
[9] 146.3 for high food deficit group; 307.5 for ECO region in 2011-13

Figure 3.3: Share of dietary energy supply by country: 1990/92 to 2009/11



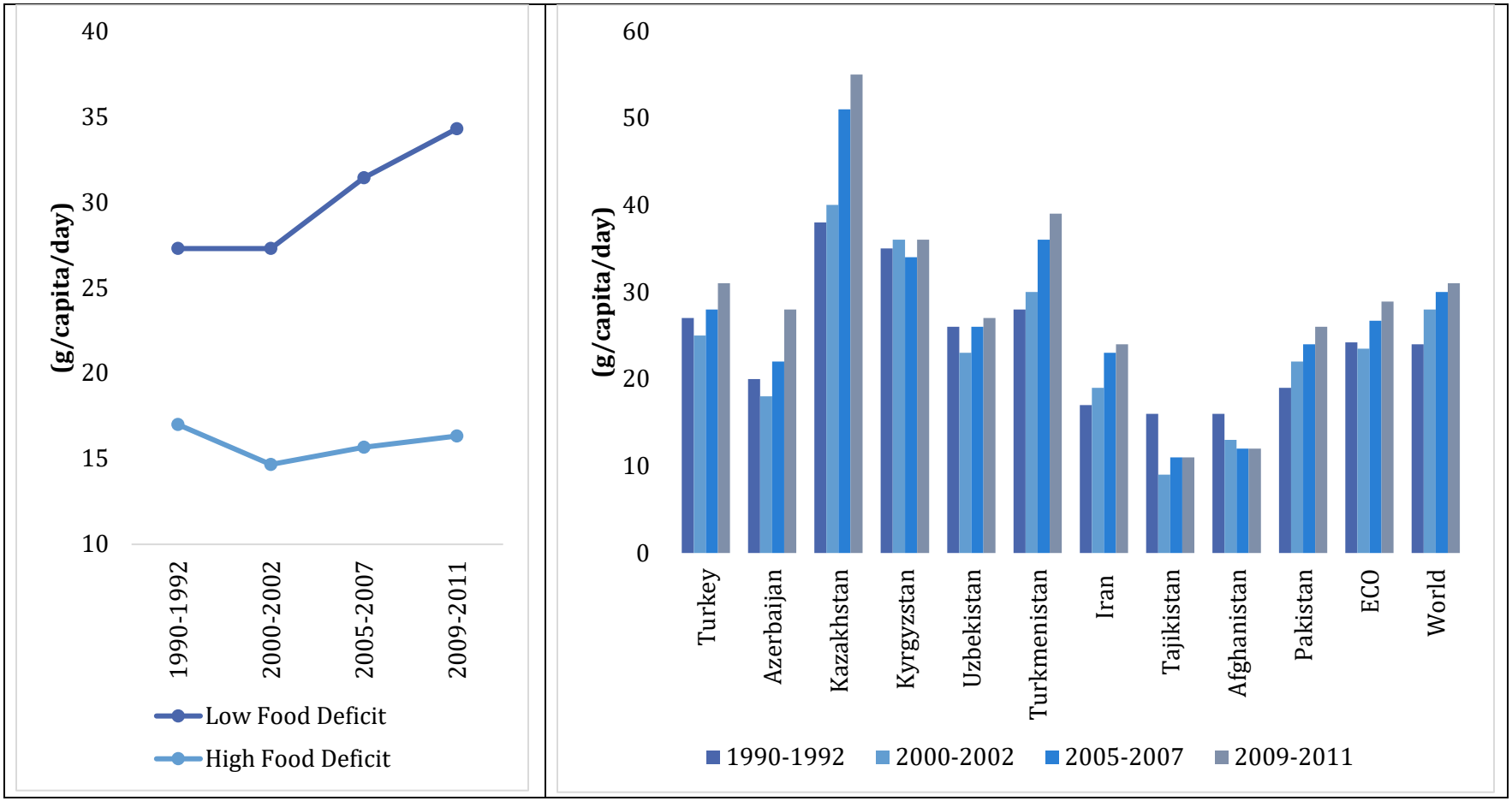
Note: Dietary energy supply derived from cereals, roots and tubers
Source: FAO (2017)

Figure 3.4: Average protein supply, by country: 1990/92 to 2009/11



Source: FAO (2017)

Figure 3.5: Average supply of protein of animal origin, by country: 1990/92 to 2009/11



Source: FAO (2017)

3.3. Stability

How do food generation and supply processes respond to shocks is one of the most important questions pertaining to food security. These shocks can originate domestically and/or internationally and may include political and economic instability, natural disasters such as floods, droughts and domestic conflicts to name a few. All of these shocks can result in disruption of the food generation processes leading to instability in domestic food suppl and/or production. Shocks that are driven by international factors may include those generated through international conflicts such as wars between countries and international trade such as recent global price hikes of 2007-08 and 2010-11. Hence in terms of stability of food supply mechanism, it is important to understand how much capacity economies have in dealing with shocks such as increased food prices, shocks to food production and/or supply mechanism such as crop failures in the face of natural crisis and conflicts.

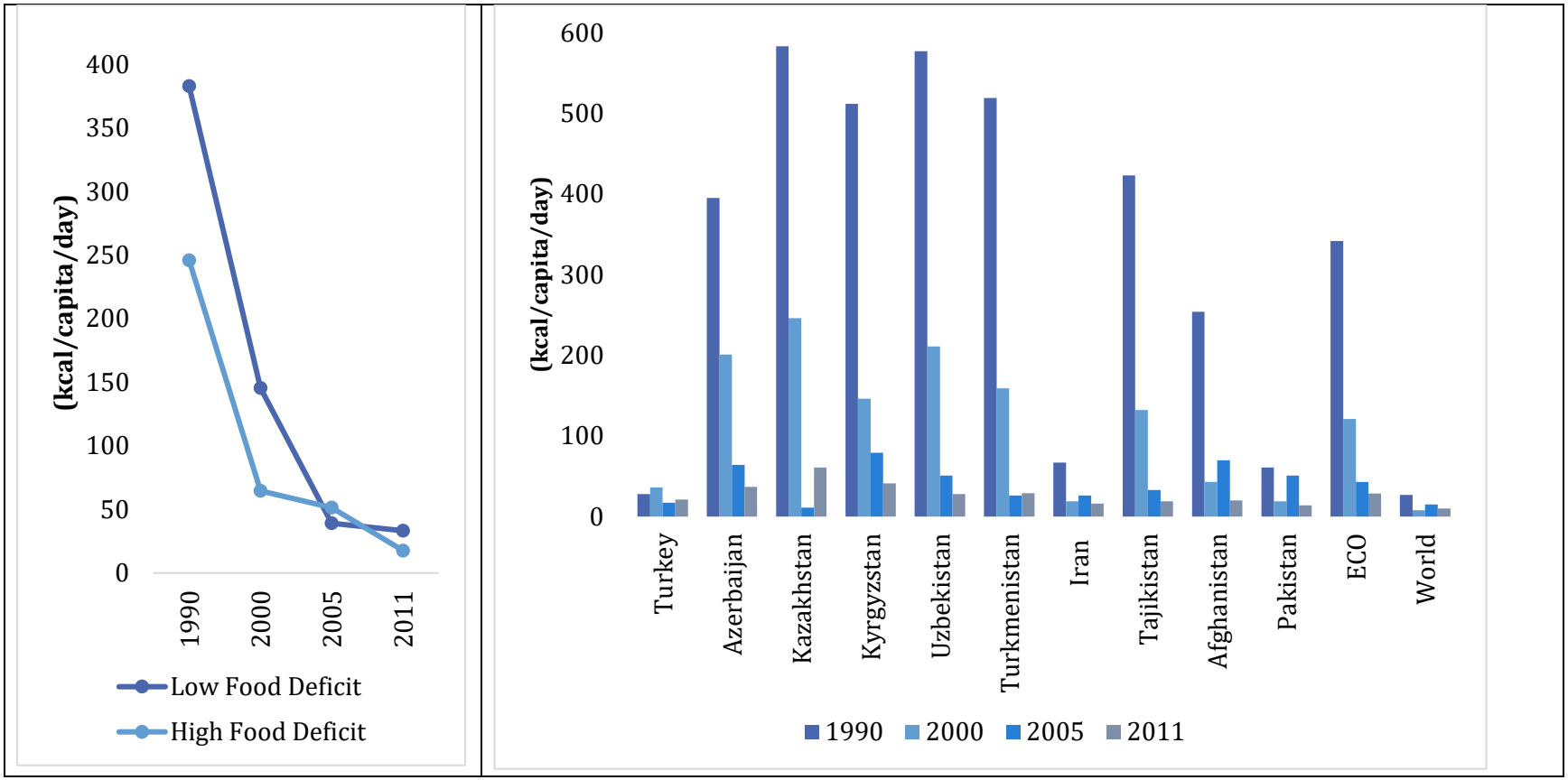
A positive trend for both low and high food deficit countries within ECO region, whereby we can see a decline in variability of per capita food supply for both these groups, reduction being slightly higher for high food deficit countries in decade of 1990s and that for low food deficit group post 2000[10]. Stability in food supply is evident from reduction in variability of per capita food production between 2000 and 2010 respectively for low and high deficit groups by 22.8 percent and 32.22 percent and increase in arable area equipped

[10] Growth rate in per capita food supply variability within 1992-2000 and 2000 -2011: -62 percent and -77.12 percent for low food deficit categorization and -73.7 percent and-72.6 percent for high food deficit categorization.

with irrigation by 6.1 percent and 1.72 percent within 2001 to 2012 for low and high food deficits groups respectively (Figures 3.4 - 3.6).

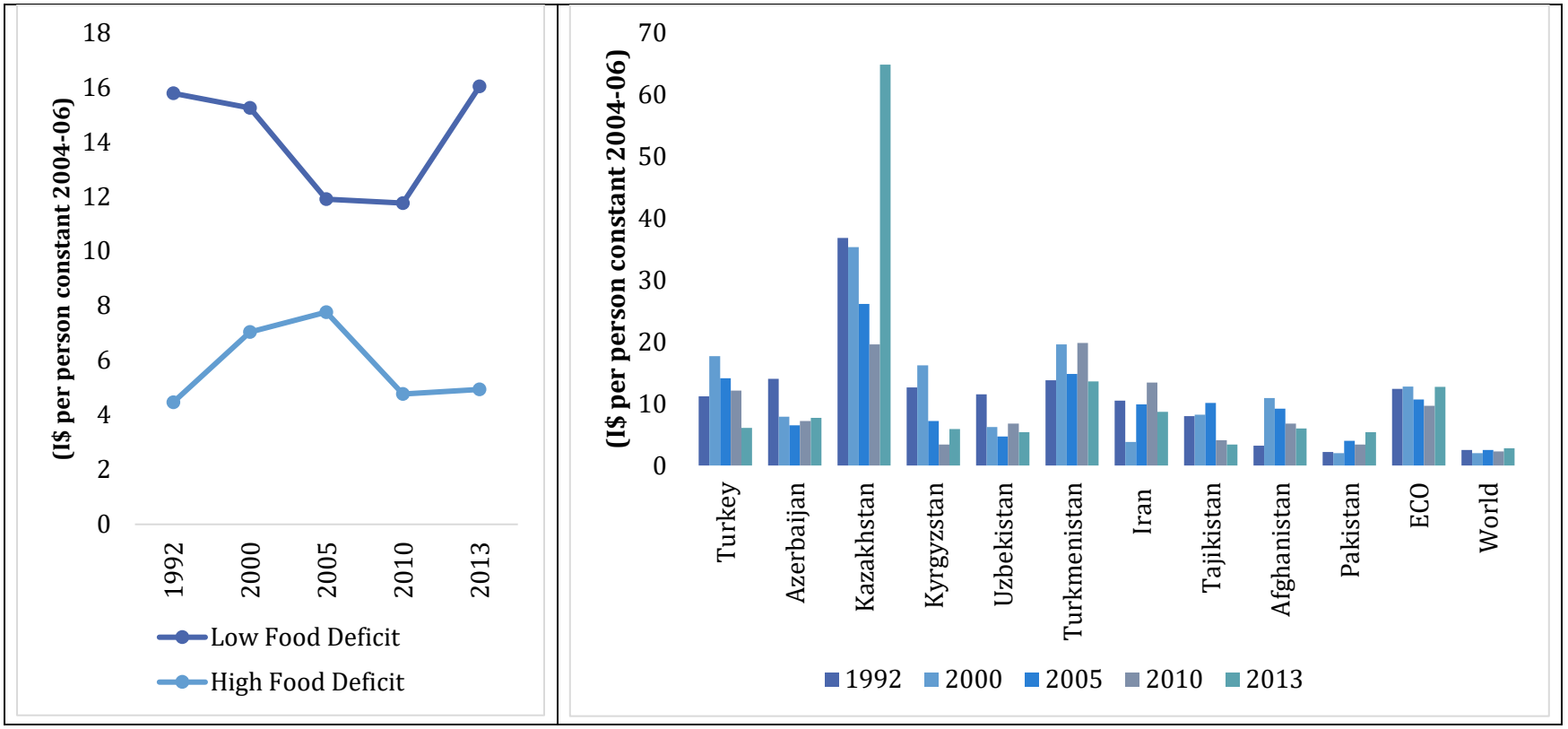
Looking at patterns in Figures 3.9 – 3.10, we can see that countries which are facing high food deficits as a group are much more vulnerable to price shocks emerging from international food markets. This relation is represented by the high levels of dependence on imported cereal with increasing level of proportion of food imports within this group. In contrast, countries which have low level of food deficit on average are less dependent on cereal imports as compared with high food deficit group with huge percentage gap across these groups over time. Average percentage of cereal import dependency and value of food imports over total merchandise exports for 2009-2011 time period has been estimated at 8.31 percent and 9.42 percent for low food deficit group and 18.3 percent and 118.3 percent for high food deficit group indicating cereal import dependency to be 120.9 percent higher in high food deficit countries compared to low deficit food countries with value of food imports over total merchandise exports being higher by proportion of 1155 percent in 2009-2011 time frame. Further we find positive and sizable percentage gaps in both these indicators across each time demarcation from 1990 to 2011 indicating relatively much higher reliance on global food supply chain for meeting domestic consumption requirements in high food deficit countries (ibid).

Figure 3.6: Per capita food supply variability, by country



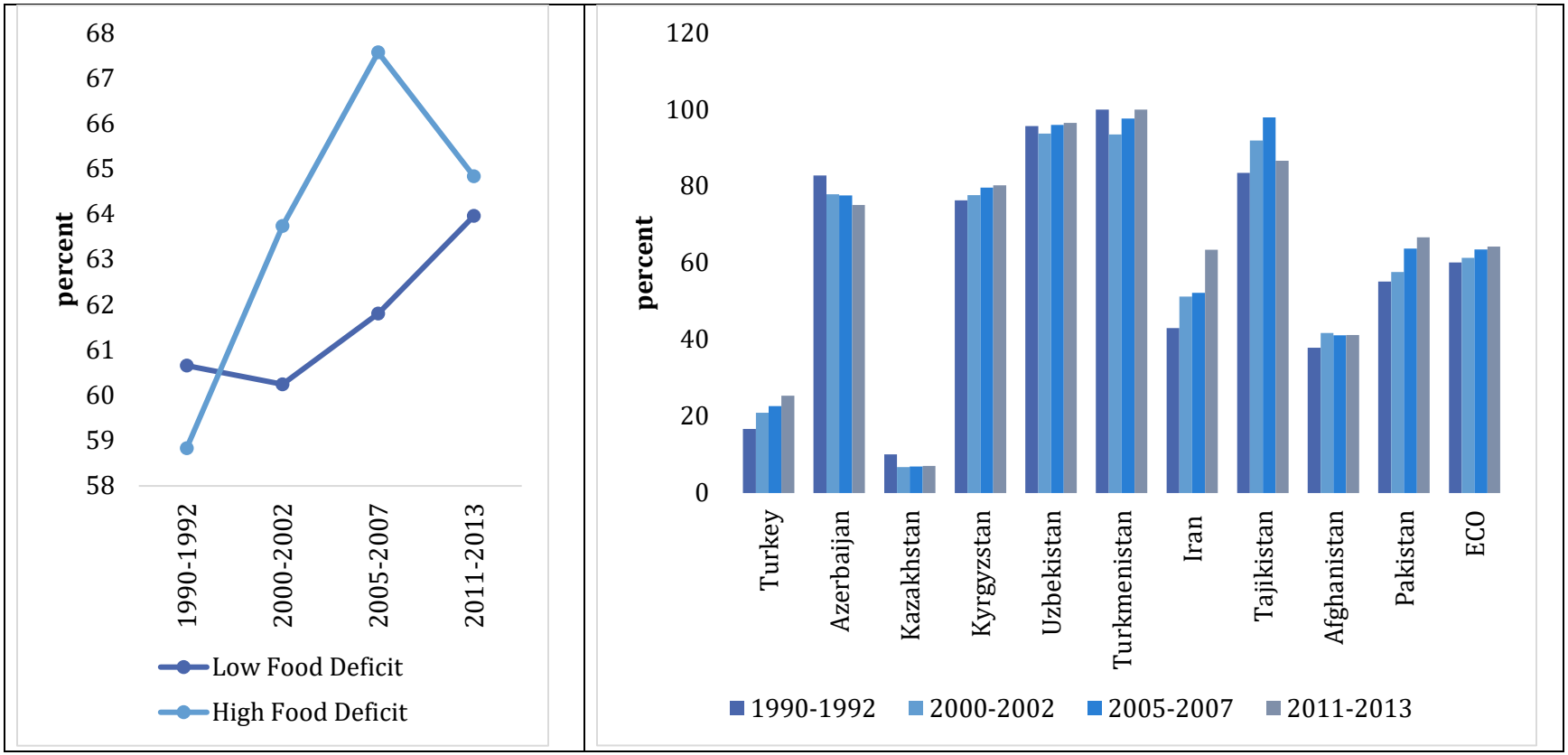
Source: FAO (2017)

Figure 3.7: Per capita food production variability



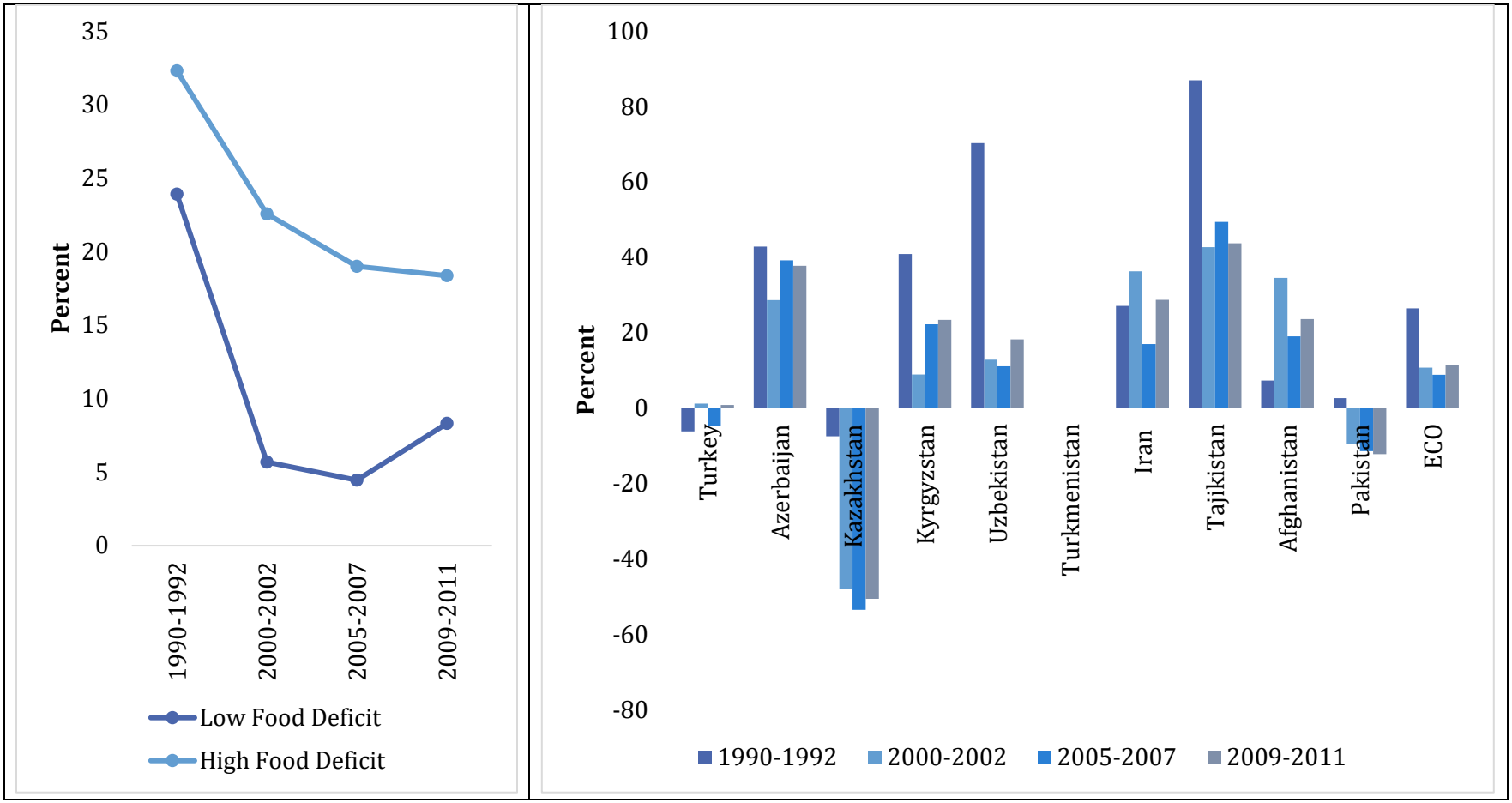
Source: FAO (2017)

Figure 3.8: Arable land equipped for irrigation, by country: 1990/92 to 2009/11



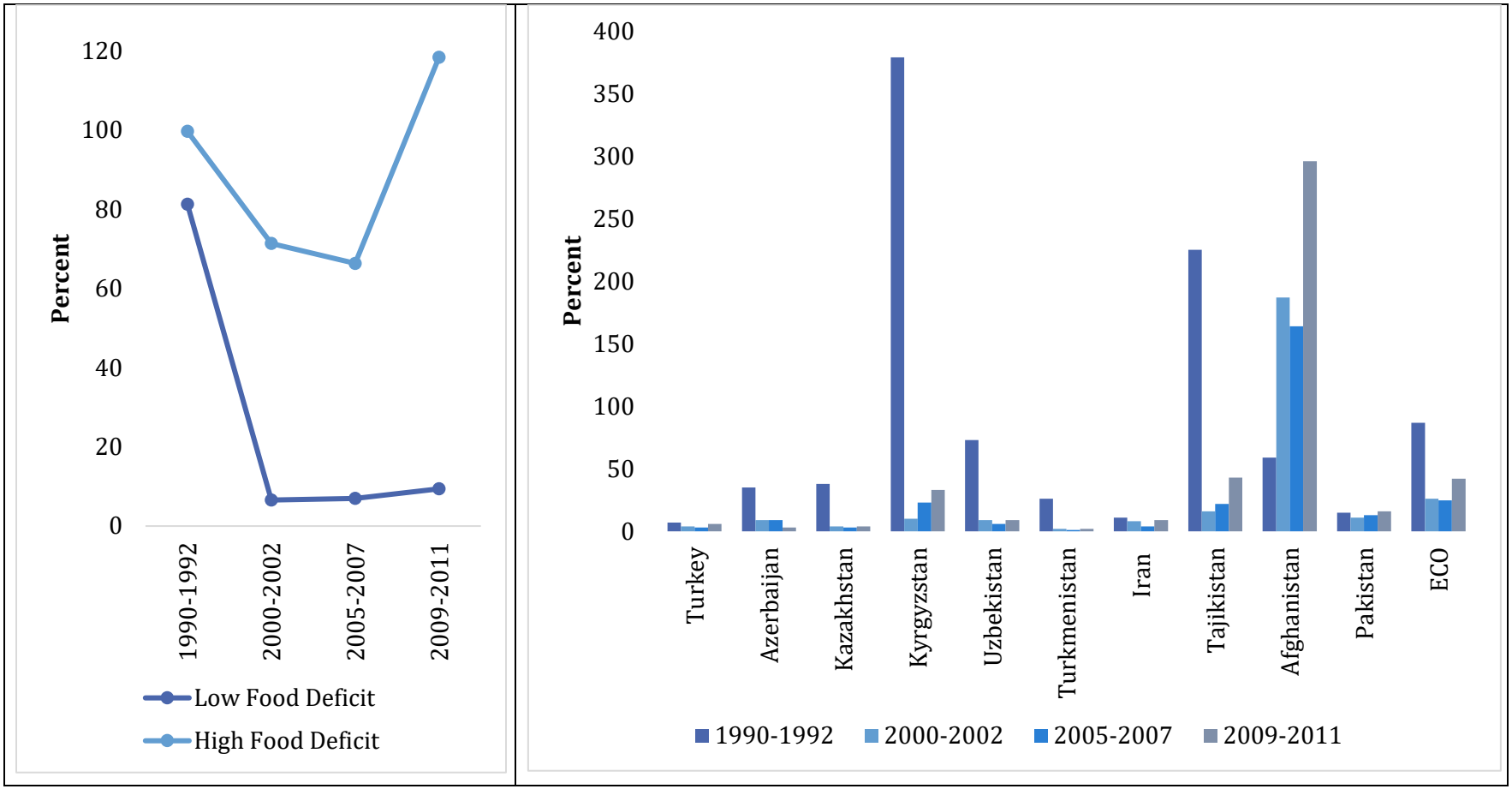
Source: FAO (2017)

Figure 3.9: Cereal import dependency ratio



Source: FAO (2017)

Figure 3.10: Value of food imports over total merchandise exports



Source: FAO (2017)

Furthermore, within the group of countries with low food deficit, there are some countries which show reliance on global food markets for meeting their cereal requirements such as Azerbaijan, Kyrgyzstan, Uzbekistan and Iran but it is important to note that these countries are protected from international shocks by having a very low percentages of food imports over total merchandise exports as can be seen in patterns in Figure 3.9 and Figure 3.10. And hence within these countries, even when we see policy of dependence on international supply for catering to domestic cereal demand, this may not be indication of vulnerability but a policy of diversification into other high value non-stable crops or other food items that are more in line with their agricultural capacities.

3.4. Access to Food

Food and Nutrition Security is a complex process which depends on many multilayered mechanisms that work together to ensure a sufficient and stable supply of food with adequate quality content and nutrition. However, aggregate sufficiency and stability of food supply in an economy is meaningless if people who are most vulnerable to hunger risks do not have economic and physical access to such supply. As highlighted in the previous section, a significant portion of individuals are facing undernourishment and malnourishment in different forms within relatively high food deficit countries in the region. Hence accessibility is important concern within ECO region.

Among the channels that have been identified as most important in guaranteeing accessibility to food is the income of households, price stability at affordable levels[11], inclusivity of institutional structures in sense of reducing inequities in line of gender[12], and rural-urban divide[13]. Besides above factors, connectivity of a region to food markets especially in case of remote and mountainous areas and degree of insulation of an economy from supply shocks such as crop failures, conflicts and natural disasters can also be considered as additional key determinants of reduced access to food for population at risk within a country[14]. Keeping in view above channels, in discussion below assessment of the issue of food accessibility and its link with capacities of countries to reduce undernourishment from their population will be done from perspective of identifying the structural difference in growth processes across low and high food deficit ECO members in terms of degree of inclusiveness and pro-poor elements within their economies. Such an analysis will be done keeping in mind that ineffectiveness of countries to deal with hunger and malnourishment needs to be understood both in context of policy link between reduction in extreme poverty and hunger eradication (link between MDG 1A and MDG 1C)

[11] Given that poor's food bundle consists of low cost calories diet with limited scope for switch to other food options, an increase in food prices can push them deeper into poverty by decreasing their purchasing power and hence reducing their food consumption. Second order impact of food price increase is in terms of reduced nutritional status for both children and adults (Mellor, 2009; Meerman and Aphane, 2012).

[12] Discussion of gender within the construct of food insecurity issue becomes pertinent not only because of overrepresentation of female among those who are food insecure, but also because of the positive and significant impact of their empowerment on a child's health and nutritional outcomes, since they are the prime caretaker (Pitt *et al.*, 2003; Quisumbing and Maluccio, 2003; Smith, 2003; WFP, 2009, p. 6; Mallick and Rafi, 2010; Duflo, 2012; Bold, Quisumbing and Gillespie, 2013).

[13] Strengthening rural-urban linkages can not only serve as a means of mitigating price shocks but can also help in addressing the problems of access to food among rural areas with high concentration of hunger issues (FAO, IFAD and WFP, 2015, p. 31; Ghanem, 2015).

[14] For detailed discussion, please refer to (FAO, IFAD and WFP, 2015; pg. 37)

as well as missed out linkage of MDG1 and MDG7 which have evolved in policy thinking as SDG zero hunger goal.

Hence our analysis of food access issue in ECO region will be divided into following two domains. Firstly, keeping the link of MDG goal 1A and 1C as a benchmark, the issue of food access will be examined not only in terms of growth and poverty nexus but also in terms of link of people in poverty (especially at extreme levels) with issue of undernourishment. Secondly from perspective of Sustainable Development Hunger goal (SDG zero hunger target) and trying to find link in MDG 1 and MDG 7 as key element in debate on food access, an attempt will be made to identify the differences in enabling environment in context of gender and rural-urban imbalances or in terms of their capabilities to handle instability (whether political, price, or due to natural disasters) in countries that are facing food inadequacies and under-nourishment than those who are food secure.

3.4.1. MDG Hunger Targets

Hunger eradication under MDGs has been intricately woven with reduction in extreme poverty by making it predominantly a problem of access as both have been dealt with together as two parts of one goal, Goal 1 (MDG 1a and 1c). The thought process behind this plausible link is the emerging empirical and theoretical consensus of various possibilities in which poor can find themselves in situation of traps (Banerjee and Duflo, 2012). Though such traps can manifest in many ways such as lack of education or credit, but one dimension that is relevant in our context is productivity lapse due to lack of proper

nutrition (Banerjee and Duflo, 2012, chap. 3). Hence growth with positive outcome for poor can play an instrumental role in reducing hunger. With this assumption in mind, we will analyze how poverty patterns are related to growth and how process of poverty reduction especially of that in extreme poverty is correlated with reduction of undernourishment rate to MDG targeted level. Our premise for this exercise is that we think that countries which have low caloric inadequacies and deficits must have much more pro-poor growth than those which have high food deficits. This assumption is not only based on underlying thought process behind the MDG 1 but is also in line with findings in FAO regional reports on discussion of food access[15]. So, from this angle, we will judge the joint progress of MDG 1A and 1C goal in ECO region by analyzing two elements: (i) extent of pro-poor growth, and (ii) extent of hunger reduction in face of pro-poor growth.

From a snapshot of aggregate estimates of the economy in terms of their growth patterns for per capita GDP and poverty for ECO region in Figures 3.11 – 3.13, it is apparent that overall periods of growth increase have positive correlation with periods of poverty reduction and this pattern stands for both low and high food deficit countries[16]. The above trend is indicative of the fact that income growth raising the spectrum with which governments can work to fight with poverty and hunger is a crucial determinant in ensuring greater food security within ECO region irrespective of whether countries have

[15] In depth discussion of food access and role of economic growth and poverty reduction in the access process, as well as the FAO perspective on the issue is given in (FAO, IFAD and WFP, 2015, pp. 27–31; FAO Regional Office for Asia and the Pacific, 2015, p. 21; FAO Regional Office for Europe and Central Asia, 2015, pp. 1–3, 6–7; FAO Regional Office for Latin America and the Caribbean, 2015, pp. 13–14).

[16] Exception to this trend of high period of growth being associated with reduction in poverty are following two countries: Azerbaijan and Turkmenistan that have been observed to show poverty reduction despite average negative growth in decades of 1990s (Figure 3.13).

met MDG hunger goal or not. However, there are differences in both average standard of living and degree of pro-poor growth among ECO countries that have successfully fulfilled the MDG hunger requirement and those which fail to reduce prevalence rate of undernourishment to target level. This can be inferred from following trends.

Firstly, from patterns in Figure 3.12 and Figure 3.13, it is evident that average per capita GDP (PPP adjusted) level for low food deficit countries as per 2014 estimates comes out to be almost five times higher than those for high food deficit countries with corresponding lower values of poverty head count ratio at USD 3.10 a day and at USD 1.90 a day as per 2010 benchmark. These estimates are lower by almost one fourth and one half respectively for low and high food deficit countries[17]. Hence it can be concluded that on average the ECO countries which have effectively dealt with hunger issues are those which have on average more resources per person and have lower proportion of people trapped in poverty and hence plausibly relatively less people with constrained access to food as compared to Pakistan, Afghanistan, and Tajikistan taken together as a group - a pattern that can be considered as an endorsement of the thought behind MDG 1a and 1c.

Secondly, one can see that low food deficit countries on average not only have much higher income levels in real per capita GDP terms with relatively lower level of poverty levels as compared with high food deficit countries but also are on average growing at

[17] Per capita GDP (PPP adjusted) on average has been estimated to be USD 14,064.1 for low food deficits countries and USD 3,000.36 for high food deficits group in 2014, while proportion of people under poverty at USD 3.10 and USD 1.90 threshold are found to be around 8.7 percent and 3.29 percent on average in low food deficit and 34.2 percent and 6.52 percent on average in high food deficit grouping.

higher rate in terms of per capita GDP growth and reducing poverty at much higher rate. In terms of empirical estimates, we can see that per capita GDP within low food deficit categorization on average has grown at 6.13 percent annually in contrast to 4.5 percent for high food deficit for 2001-2010 decade. Furthermore, this growth in per capita GDP corresponds with reduction in poverty levels both at USD 3.10 a day threshold and for extreme poverty threshold of USD 1.90 a day for both low and high food deficit grouping, however reduction rate in poverty levels are found to be relatively higher in low food deficit groups for USD 3.10 a day threshold and relatively higher for high food deficit group in case of extreme poverty threshold of USD 1.90 a day[18]. Hence from above estimates and by looking at patterns in Figure 3.11 and Figure 3.12 above, it is evident that countries which are grouped among low food deficit region on average have growth patterns that are more pro-poor than those will high food deficits.

Finally, in terms of Gini inequality at level, though we do not find any clear difference between low and high food deficit countries implying that perhaps there is no evidence of any apparent trend that can be considered as more pro-poor and equalitarian outcome for countries with higher food security. However, looking at growth in inequality, we do find such a pattern which shows that rate of inequality reduction is more in countries which are actively managing their hunger issues than countries which have failed to achieve MDGs and WFS targets. This may be resulting from some policy factors due to

[18] These rates are estimated at 76 percent for low food deficit and 56 percent for high food deficit for the USD 3.10 a day threshold and for the USD 1.90 a day threshold these figures come out to be 80.05 percent for low and 84.25 percent for high food deficit group.

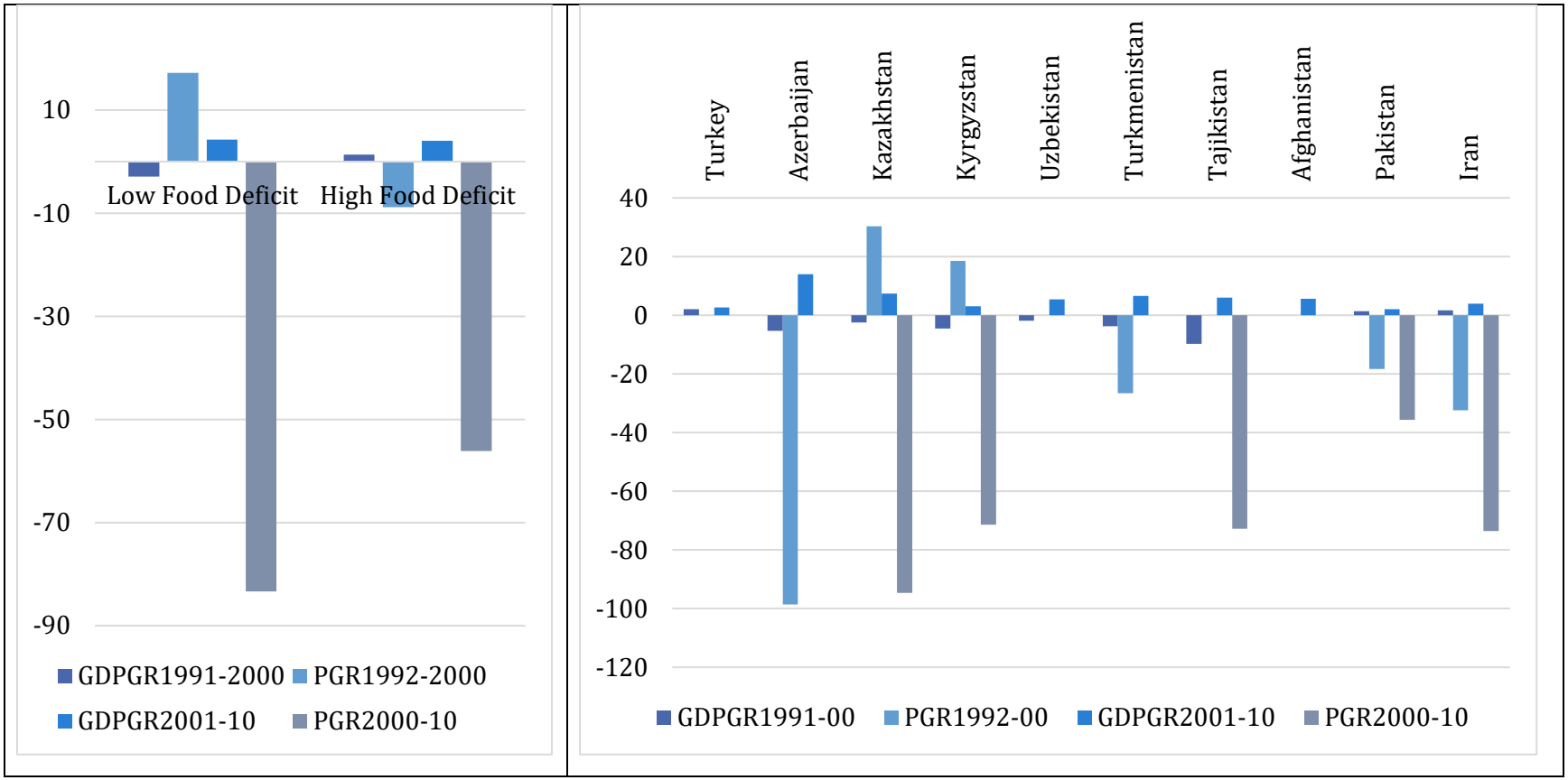
which not only we are observing a positive association between GDP per capita growth and poverty reduction but also higher distributive tendencies not in sense of lower initial values for Gini inequality but faster redistributive rate in countries with better nourishment outcomes.

We can conclude that countries which have been documented to be relatively more food secure with portion of people facing undernourishment within the MDG targeted limits are mainly those that have higher per capita GDP level and lower poverty levels than those within high deficit food countries. This suggests that having higher living standard is also another key aspect in the delivery of better nutritional outcomes within ECO region, and that countries which had effectively reduced undernourishment from their population to fulfil MDG hunger target in 2015 had a growth strategy which was more participatory and favorable for the poor. However, it is important to note that there is not one to one mapping of poverty levels with hunger reduction in some countries within ECO.

Kyrgyzstan was able to achieve MDG targets in 2015 yet in terms of GDP level not only it is at much lower level than regional mean value for low food deficit group[19] but it has almost 20 percent population below USD 3.10 poverty line and 2.91 percent below the extreme poverty threshold (high by international standard). Moreover, this matches with the figures for countries in the high food deficit group; such as Tajikistan. This discrepancy between high level of poverty and effectively reducing portion of undernourished

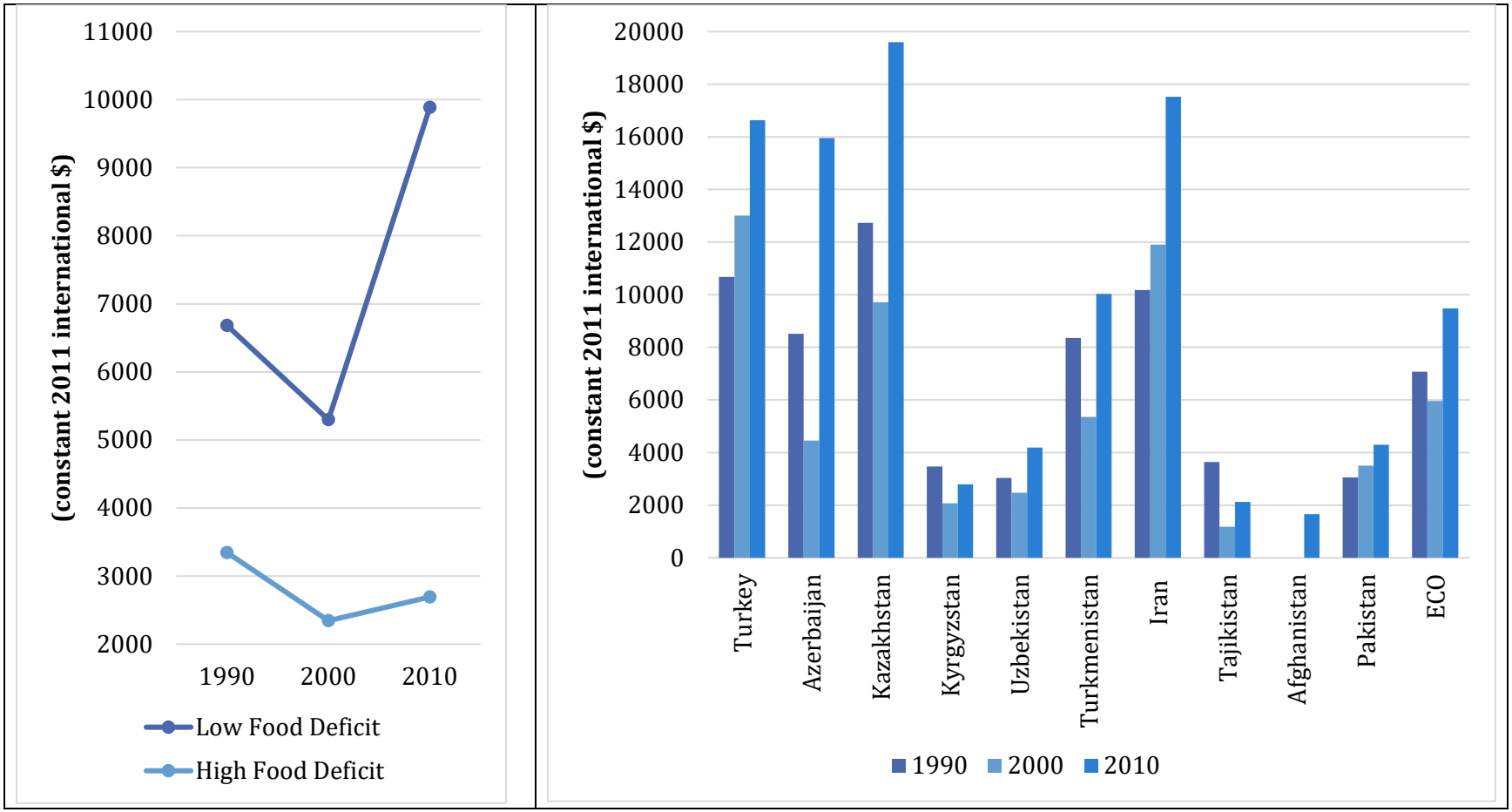
[19] As of 2014 information, per capita GDP (PPP adjusted) level for Kyrgyzstan is USD 3169.5 and that for low food deficit group is USD 14064.1.

Figure 3.11: Nexus of growth in per capita GDP and poverty headcount ratio



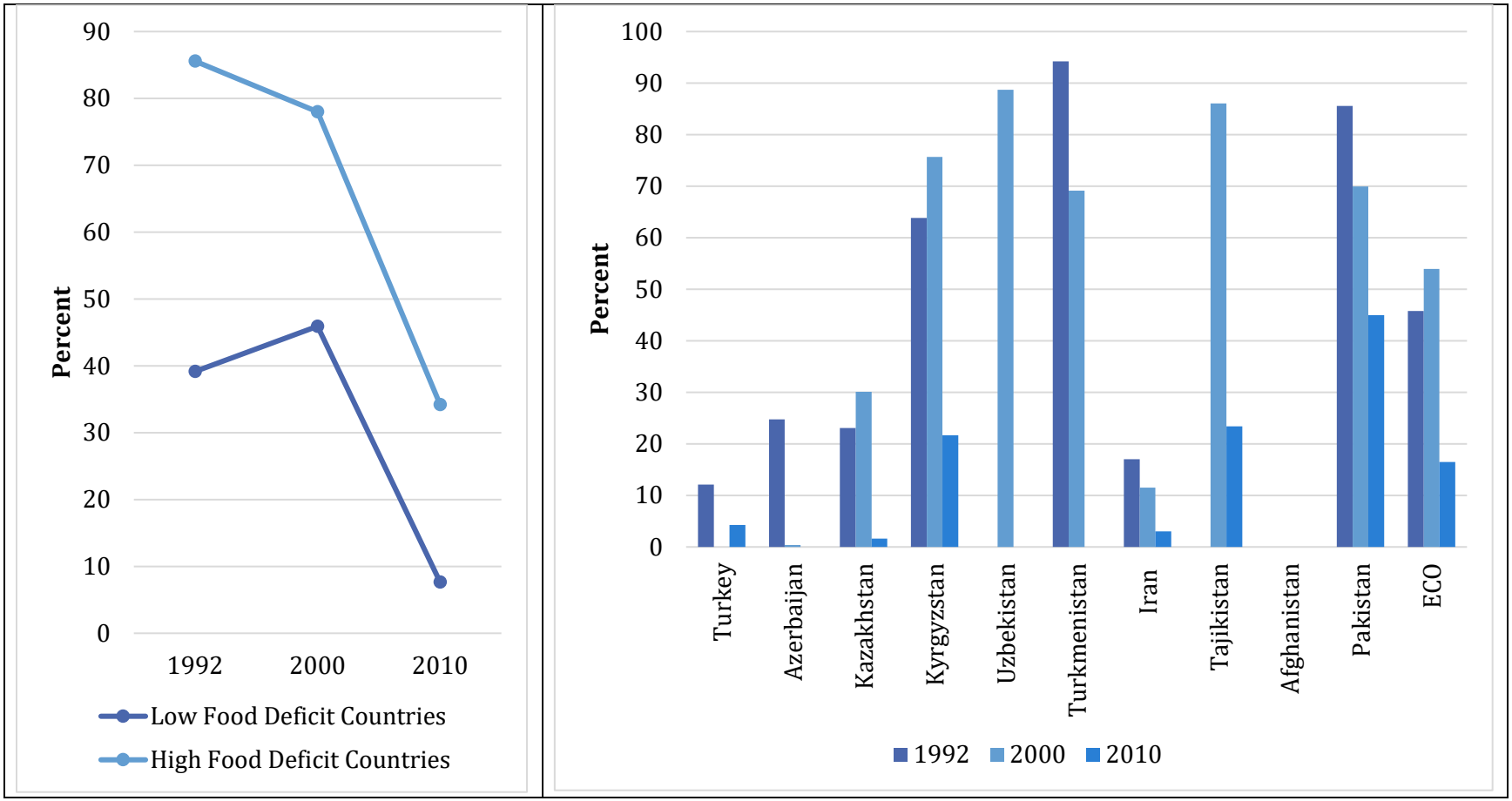
Note: Poverty headcount ratio at USD 3.10 a day (2011 PPP)
Source: World Bank (2016)

Figure 3.12: Gross domestic product per capita, PPP



Source: World Bank (2016)

Figure 3.13: Poverty headcount ratio at USD 3.10/day (2011 PPP)



Source: World Bank (2016); Based on available values closest to 2000 and 2010

population in Kyrgyzstan may be partly indicative of the fact that the income poverty lines that are typically used as poverty threshold may not be food only poverty lines and may also be reflecting elements related to overall cost of living and not merely those that are relevant for monitoring lack of access to food. Furthermore, within Kyrgyzstan, using the higher poverty line of USD 3.10 a day may be a more appropriate threshold due to high cost of living in the face of extreme cold temperatures. However, in our context the important aspect is not this anomaly but how hunger reacts to the rate of poverty reduction.

However, irrespective of such high presence of poor in Kyrgyzstan, the process of pro-poor growth[20] proved sufficient to bring undernourished population size within MDG range. This pattern again endorses the link between MDG 1a and 1c that reduction in extreme poverty will reduce incidence of hunger. However, an important point to note here is that though both indicators: proportion of people under extreme poverty threshold and proportion of undernourished people from total population show a decreasing trend after 2000 in Kyrgyzstan, yet the rate of decrease is much more in the former than the latter indicator. Furthermore, if we compare this pattern across other countries, we find this to be true for all ECO countries (with the exception of Iran) irrespective of whether they succeed in reducing incidence of hunger to MDG requirement or not.

To assess the effectiveness of poverty alleviation measure for removing hunger and starvation, it is important to study not only the association between their reduction rates

[20] Within Kyrgyzstan, on average per capita GDP has been estimated to growing at 3 percent with reduction in extreme poverty at 90 percent for 2000-2010.

but also their relative rate of change. This must be done in the backdrop of policy environment within a country and its structural elements that can differentiate the economies which have effectively reduced hunger by capitalizing on spells of high growth from those that have relatively less growth with less pro-poor outcomes as in in case of high food deficits. Among countries facing high food deficit namely Pakistan and Tajikistan[21], though we find evidence of pro-poor growth with reduction in extreme poverty levels at rate of 70.8 percent and 91.2 percent respectively for 2000-10, but in comparison with low food deficits region, process of hunger reduction is taking place at much lower rate at around 3.1 percent for Pakistan and 3.6 percent for Tajikistan as compared to countries in low food deficit regions which on average reduced hunger at rate of almost 35 percent. In both these countries, patterns in poverty and hunger reduction though keep the conceptual link in MDG 1a and 1c intact, yet much lower rate of decrease in hunger than those in low food deficit categorization points to a process where poverty eradication is taking place but is not enough to tackle both the problem of poverty and undernourishment because of perhaps varied structural factors from those of low food deficit countries. This takes us to next point of discussion that is food access in terms of linking MDG 1 to MDG 7 in terms of sustainability process which is base of SDG zero hunger targets.

[21] No information is available on poverty levels for Afghanistan.

3.4.2. SDG Zero Hunger Targets

SDGs are a continuation of the MDG initiative and have evolved considering lessons learned from successes and failures of countries in meeting MDGs. In case of tackling hunger issue, among few prominent patterns that have emerged globally is that though incidence of hunger reduces as poverty levels decrease but the pace of poverty reduction is much higher than that of hunger reduction (FAO, IFAD and WFP, 2015, p. 27). These patterns are also validated by our findings above for both low and high food deficit countries. Further another shortcoming in the MDG hunger monitoring through undernourishment prevalence rate is its inability to fully capture the deeper aspect of hunger that is malnourishment and over-nourishment which if not addressed proactively at policy front will keep people in hunger confined into their poverty traps due to their reduced ability of productive work. Recognizing this health and poverty trap for people in hunger, it is important to understand why individuals do not have food access, where they live, what sort of profession they are involved in, and their exposure to natural and economic risks. Also, besides examining the link between extreme poverty and undernourishment, there is a need to explore the determinants of lack of access to food that brings people to starvation. It is important to go beyond the mere link of MDG 1a and MDG 1c and study the issue of food access in the context of economic access and in context of demographic structures within an economy.

Other factors such as extent of inclusive agricultural investments, strength of rural-urban linkages, degree of economic integration of marginalized groups, and macroeconomic and political stability are important in ensuring sustainability and access

to food. Keeping in mind SDG zero hunger target and trying to find link between MDG 1 and MDG 7 for its achievement, the variation between low and high food deficit countries in the region will be examined in the context of their pursuit of four key structural features.

3.4.2.1. Demographics Dynamics and Strength of Rural-Urban Linkage

A closer look at demographics dynamics reveals that high food deficit countries not only have a much larger size of population but also have population growing at much faster rate and this stands for both rural and urban segments and for all time periods 1990-2000, 2000-10 and 2011-15. Further in terms of relative size of the rural to urban population, we can see that high food deficit countries have much higher proportion of rural population as compared to urban populations with this proportion standing at 73.2 percent for both Tajikistan and Afghanistan and 61.2 percent for Pakistan. This relatively higher concentration of population in rural sector within high food deficit countries in comparison with low food deficit group, and much lower growth in agricultural value-added per worker within 2011-15 period reflects a lower stage of development. It also highlights the potential of agriculture led growth as a pro-poor growth strategy in these countries.

Strengthening the rural base through inclusive investments as emphasized in SDG targets will not only address the food security issue, but with increase in agricultural labor productivity can be of tremendous help in accommodating the rising process of urbanization. As per estimates among high food deficit region, though annual GDP growth is higher than urban population growth in case of Tajikistan and Pakistan, but in case of

Afghanistan urban food security is a huge problem given that its urban absorption ratio stands at 3.51 percent.

3.4.2.2. Physical Access to Food

In terms of variation in degree of connectedness of food supply chains with remote markets[22] across high and low food groups, we try to capture regional difference in the indicators of infrastructure like percentage of paved roads, road-densities and rail-densities across the ECO countries so as to assess in countries which have failed to resolve their hunger issues how much role can be attributed to lack of physical access to food and how much to dynamics related to economic processes. However, we cannot see any conclusive pattern in this context that can differentiate the countries within low and high food deficit categorization. In terms of proportion of population with access to improved water sources and sanitation, we can see that on average Pakistan, Tajikistan and Afghanistan taken as a group have much lower access than those in food deficit group.

3.4.2.3. Difference in Female Empowerment

A look at patterns by gender in labor and educational outcomes shows that within countries in high food deficit grouping, not only average females participate at much lower proportion in labor force as compared to males but in terms of education too females in

[22] Physical connectivity to food supply chain in case of remote areas is of great importance for twofold reasons: firstly, such areas may be more prone to food shortages given higher likelihood of extreme weather condition for local food production as in case of mountainous regions and secondly enhanced cost of transportation in face of lack of proper roads etc. in these areas can raise the price of food bundle to unaffordable levels for the poor.

these countries are far behind their male counterparts. Moreover, in comparison to low food deficit countries the margin with which females remain below males in both labor and schooling outcomes is much higher in Afghanistan, Tajikistan and Pakistan. Hence females seem to be structurally less empowered within the countries that failed to achieve MDG than those that succeeded, and these patterns are more pronounced in Afghanistan and Pakistan as compared with Tajikistan within the high food deficit region.

3.4.2.4. Difference in Macroeconomic Stability

A stable macroeconomic environment is an important factor in promoting economic growth and food price stability. There are several elements that are important in ensuring a conducive macroeconomic environment for growth such as political stability, domestic security and less exposure to natural calamities such as droughts and floods etc. On average we do find that countries in low food deficit region have much stable political environment and also have much lower percentage of population exposed to droughts, floods and extreme temperature and terrorism on average as can be seen from patterns in Figure 3.14 and Figure 3.15. Hence their population is more protected from risks to food access in the form political instability, terrorism or natural disasters.

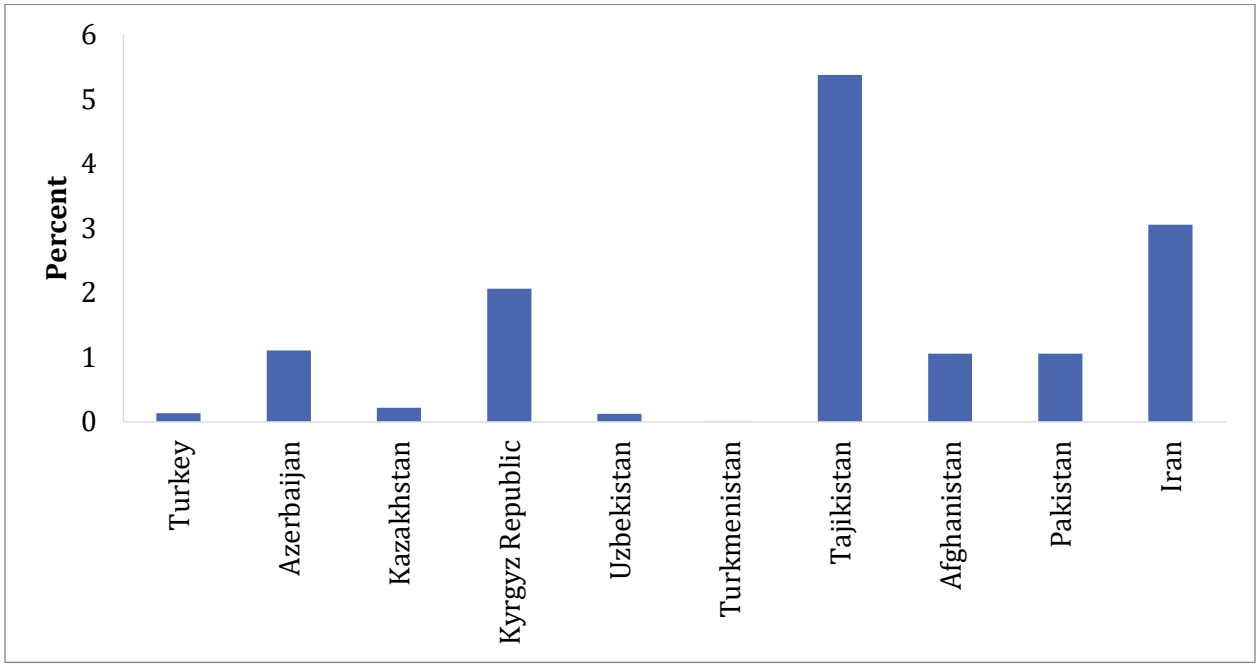
To grasp the true essence of why there may exist varied access to food across high and low food deficit countries, it is important not just to monitor patterns of reduction in poverty and hunger incidence but also analyze the factors that may be generating such correlations.

3.5. Utilization

The final dimension of whether a population is secure in terms of food must deal with nutritional content of food and absorption of food intake. This aspect goes beyond level of undernourishment to deal with chronic aspect of hunger; monitoring of which is of paramount significance for any nation given that such tendencies can initiate vicious trap of low productivity and poverty both at micro level and at national level. For example, mothers with nutritional imbalance perhaps due to mineral and vitamin deficiency will most likely give birth to malnourished babies whose deficiencies if not corrected can materialize into their lower educational and labor market outcomes later in their lives. Further if above stated process takes form of mass phenomenon then its impact can be felt on the whole economy in the form of lower productivity and lackluster growth.

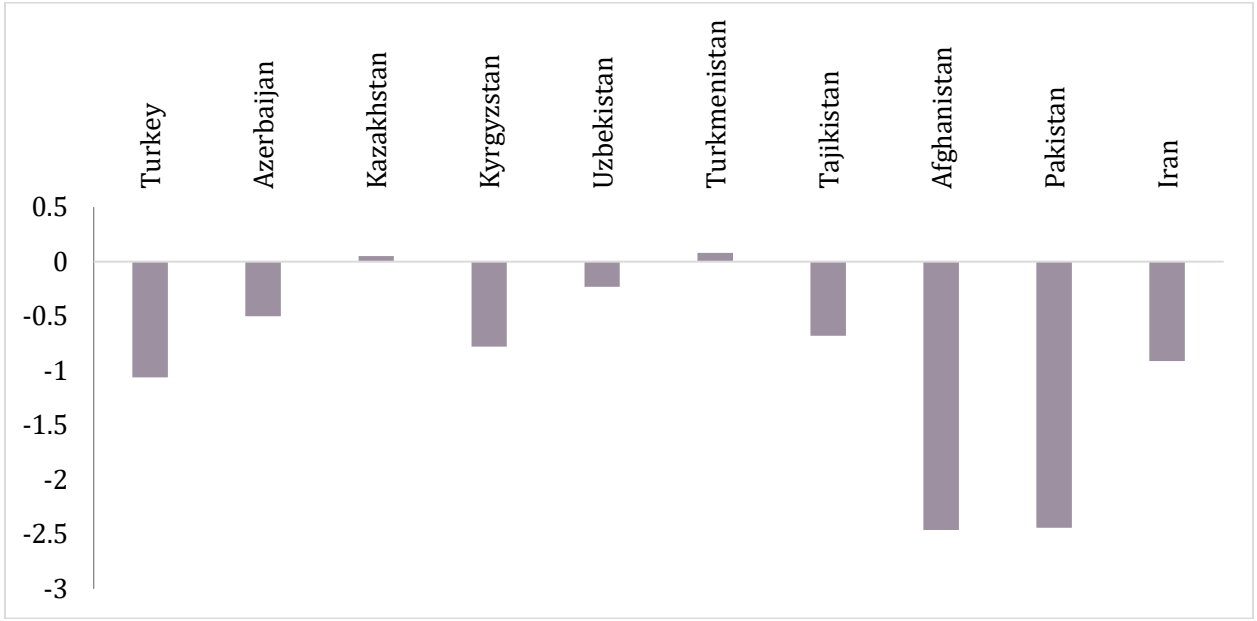
Hence it is important to assess the status of food security not only in context of undernourishment but also in terms of indicators of chronic hunger such as percentage of children under age of 5 with signs of wasting, stunting, of being under weight and over-weight for their age to identify the differential patterns (if they are present) across low and high food deficit countries. Further beside outcome indicators in terms of weight and height, differences in preventive care practices which can be of consequence for improving the utilization aspect of food or in proportion of population with minerals and vitamins deficiencies also need to be understood across low or high food deficit. The following trends emerge from estimates for the indicators related to various elements of chronic hunger.

Figure 3.14: Droughts, floods, extreme temperatures: average 1990 to 2009



Source: FAO (2014)

Figure 3.15: Index of political stability and absence of violence/terrorism: 2014



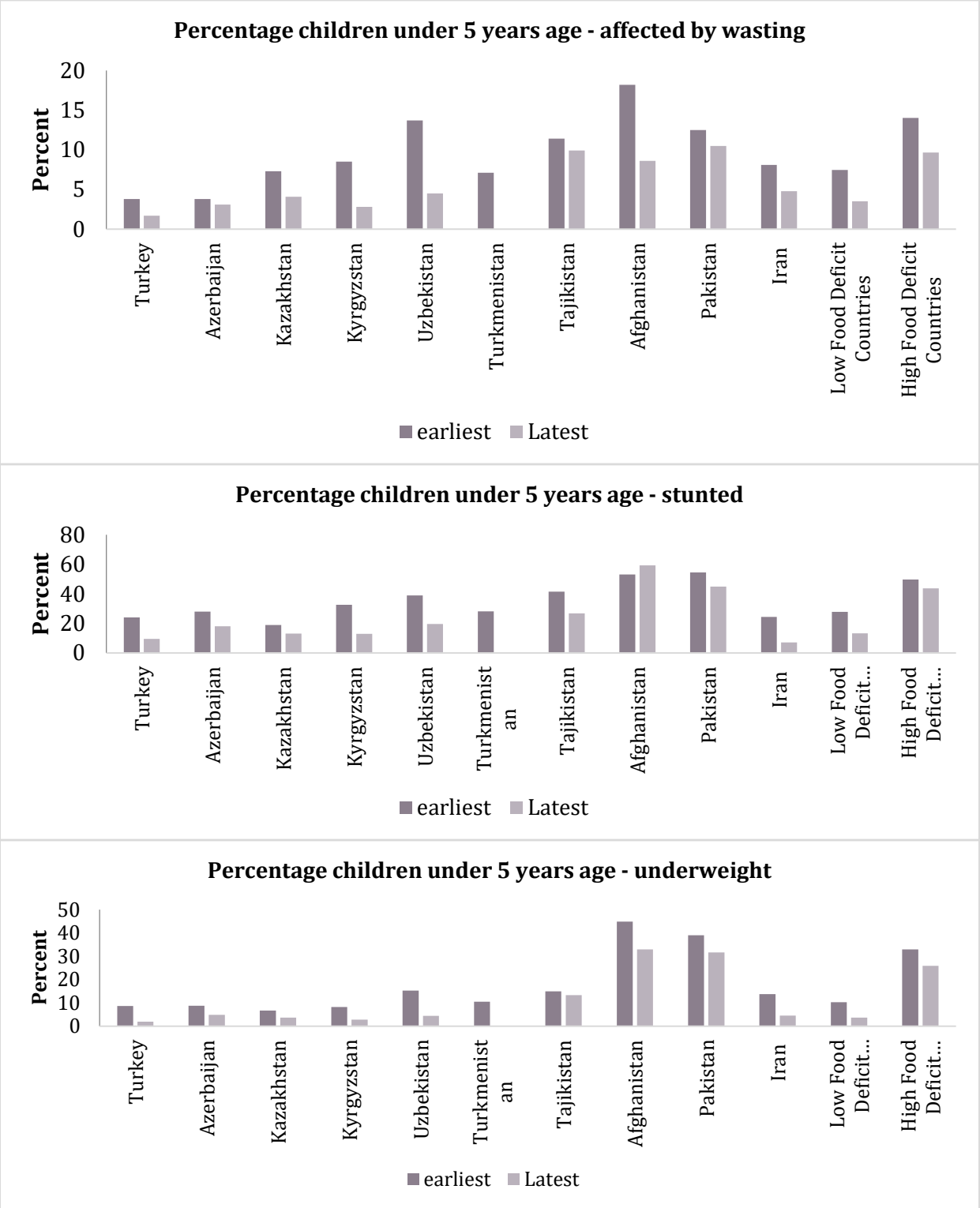
Source: FAO (2014)

From estimates of malnourishment indicator for children under age of 5, we find that compared to countries in low food deficit, not only situation is much worse for countries with high food deficit in terms of average percentages of children with wasted, stunted and underweight growth but also in terms of rate of decrease, which in magnitude is relatively much higher in ECO sub-region that has succeeded in fulfilling MDG hunger goal. Hence Afghanistan, Tajikistan and Pakistan are not only behind in terms of reducing undernourished population but also are facing deep malnourishment in different forms, the problem being most serious in case of children with stunted and underweight growth.

Though low food deficit countries are reducing malnourishment in children, yet the proportion of children with stunted growth remains high with lowest incidence of 7.1 percent for Iran and highest of 19.6 percent for Uzbekistan. Hence low height for given weight remains a problem within the low food deficit ECO region.

In terms of obesity in children, the estimates reveal that overweight children are more prevalent in low food deficit countries than in high food deficit countries, being in magnitude of 10.6 percent for former and 5.3 percent for the latter on average. Not only is there a high prevalence of obese children, but they are overtime increasing in Turkey, Azerbaijan, Kazakhstan and Iran. This is an indication of shift in lifestyle and diversification probably due to high protein diets with higher level of development.

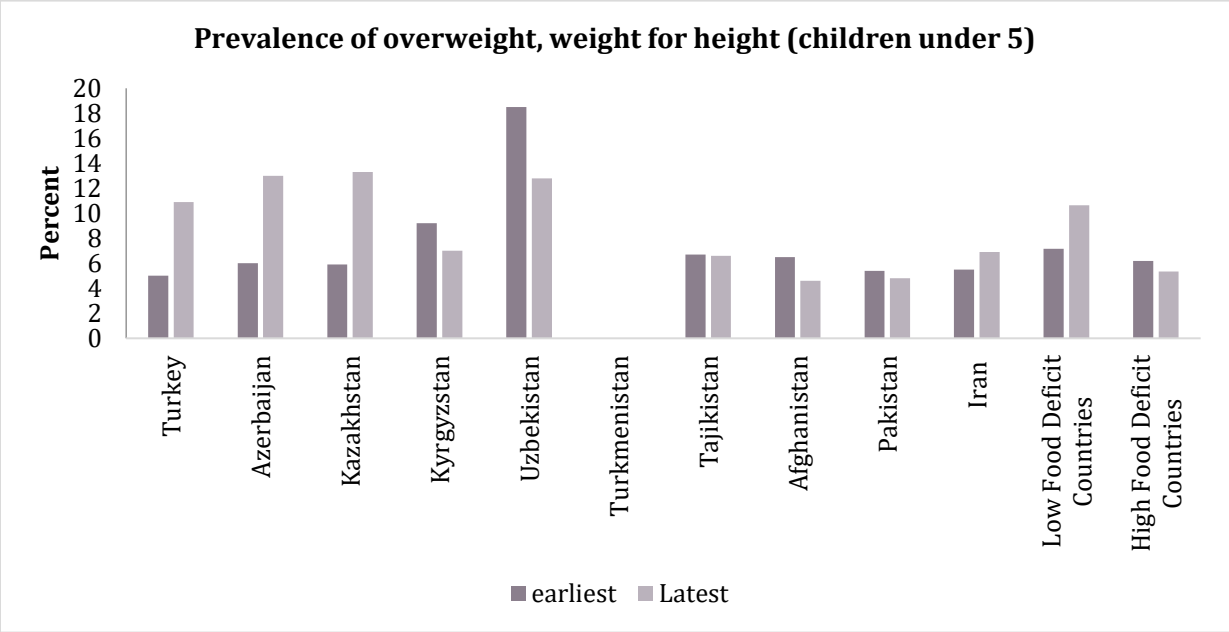
Figure 3.16: Indicators of Malnourishment in Children



Source: FAO (2014)

Incidence of anemia in both children and expecting mothers is slightly less in low food deficit countries as compared to that in high food deficit region along with relatively higher rate of decrease. However, in other forms of deficiencies that is in iodine and vitamin A, we can see that estimates seem to be spread unevenly with patterns favoring the low food deficit for the former and high food deficit region for the latter.

Figure 3.17: Indicators of Over-nourishment in children



Source: World Bank (2016)

Finally, in terms of immunization for Diphtheria, Pertussis, Tetanus (DPT) and measles there is much higher coverage of children in low food deficit region than high food deficit countries indicating much better preventive care from diseases in the former. However, there is significant and sizable increase in growth in child coverage within high food deficit countries which show that over time prevention is coming into focus in these countries too.

3.6. Conclusion

Within the ECO region there is variation in member countries in terms of fulfilling the MDG hunger goal. Tajikistan, Afghanistan and Pakistan could not meet this target and are thus vulnerable in terms of food and nutritional situation which needs immediate policy attention. However, from analysis of various dimension of food security, we find that high food inadequacy within these countries is not a problem of food availability but of food access. Further looking deeper into country specific temporal patterns within the high food deficit region, we can see that Pakistan holds the largest size of under nourished population with Afghanistan and Tajikistan at respective second and third position but in terms of prevalence rate of undernourishment Tajikistan tops the list followed by Afghanistan and Pakistan. Hence there is varying degree in which problem of food deficiency manifests itself within the high food deficit countries, a pattern which will be analyzed in more depth in policy discussion in next chapter.

In the context of access to food, we find that on average the ECO countries which have successfully fulfilled the MDGs have relatively strong pro-poor growth process than those that could not meet these targets by 2015. This emphasizes not only fundamental role of poverty alleviation policy efforts in tackling hunger issue within ECO region but by reinforcing the recognized pathway within MDG 1a and 1c targets, highlights the wider debate on the link between reduction in extreme poverty and reduction in hunger incidence. However, from experiences of countries in low and high food deficit ECO regions, process of poverty eradication is much faster as compared to reduction of hunger. Hence it

is important to go beyond the mere connection between reduction in extreme poverty and hunger alleviation to structural differences and growth strategies across countries.

In terms of chronic hunger, our estimates show that malnourishment is more an issue of high food deficit countries namely Tajikistan, Afghanistan and Pakistan. Obesity is an issue in countries that successfully decreased undernourishment prevalence rate to meet the MDG specified limits including Iran, Turkey, Azerbaijan, Kazakhstan, Kyrgyzstan, Turkmenistan and Uzbekistan. This pattern is a reflection of how chronic hunger can change and evolve its form as lifestyles and eating habits change with development.

Chapter 4 - A Policy Perspective on Food and Nutrition Security

4.1. Introduction

Food insecurity has manifested itself in the form of both under-nourishment and over-nourishment within the ECO region. The earlier analysis in this report identified Afghanistan, Pakistan and Tajikistan as the only ECO member countries experiencing undernourishment and hunger while other ECO member states were characterized as low food deficit countries. The differences in food security situation in the ECO region highlight the challenges of formulating a policy response that is tailored to address the myriad issues being faced by the high food deficit countries and the low food deficit countries.

More specifically, in the case of the three high food deficit countries, the challenge is to ensure a sufficient supply of nutritious food for their populations that does not exclude the poor and vulnerable from access to this supply. On the other hand, in the case of the remaining countries that have fulfilled their MDG targets in time, the important policy concern is not only to ensure the sustainability of processes that have helped in eradicating hunger within national boundaries, but also to counter tendencies of excessive nutrition which may make their population vulnerable to obesity related health issues such as cardiovascular diseases. Hence to deal with these diverse policy goals not only do we need to place discussion in the light of divergent patterns across low and high food deficits countries in their processes of food availability, stability and access but also to identify their structural heterogeneities. There is therefore a need to further investigate the growth mechanism and food chain processes from production to distribution to identify how

different sectors of economy including industry, services and agriculture are contributing in growth processes; with what intensity poverty is located across rural and urban sector; and what is the role of agriculture sector and rural development in removing the constraints that are generating food insecure outcomes within food deficit regions.

Against this background, the aim of this chapter is to set out key features of the policy climate in ECO member countries and detailed policy analysis to identify what could be possible measures to deal with double burden in food insecurity outcomes within ECO region. This discussion will be framed in the light of the current global policy debate on food policy to provide a viable policy mix for ECO member countries to achieve food security. Section 5.2 reviews the policy climate related to food security in the ECO member countries, while 5.3 analyzes the possible policy directions to eradicate hunger. Section 5.4 presents key policy messages for the ECO member countries that emerge from the analysis.

4.2. Policy Climate in Member Countries

The ECO region is facing a double burden of food insecurity. On the one hand, the high food deficit countries experience under- and mal-nourishment (stunting, wasting and micronutrient deficiencies) and on the other hand over- nourishment (obesity and stunting). In this context, the possible measures that can be employed at the national as well as the regional level will depend on the policy climate in the member countries as well as on key differences between the two groups of countries.

It is evident that the locus of hunger and malnourishment within ECO region is primarily in three countries; namely Afghanistan, Pakistan and Tajikistan. The intensity of hunger problem is evident in the significant shares of undernourished in total population (24.81, 21.43 and 33.20 percent respectively[23]). Hence to eradicate undernourishment and mal-nourishment from ECO region requires a policy focus on these three countries primarily because of the increasing divergence between incidence of under-nourishment in the high food deficit countries versus the low food deficit countries.

Furthermore, hunger and mal-nourishment within the high food deficit countries is more a problem of access to food for the poor and vulnerable groups rather than the availability of food itself. This can be inferred from values of 108 percent, 99 percent, and 97 percent for Average Dietary Energy Supply Adequacy in Pakistan, Afghanistan and Tajikistan respectively. Given the adequacy of food supply within these countries this indicates that phenomenon of hunger is likely not due to insufficient food supply but due to bad distribution and low purchasing power of people trapped in extreme poverty.

Among the low food deficit countries, Turkey and Kazakhstan have maintained levels of undernourished below 5 percent since 1990-92, while Iran and Uzbekistan were able to meet the MDG 1C target before 2015. On the other hand, Azerbaijan, Kyrgyzstan, and Turkmenistan fulfilled both MDG 1C and WFS criterion in 2015. There are policy lessons to be learned from these countries in terms of their successful attempts to

[23] Based on World Bank data for the year 2016

eradicate hunger at the national level. It is important to analyze how the low food deficit countries have achieved relatively more pro-poor growth processes and identify the policy processes through which these countries are showing evidence of much higher growth in economic size of food production and relatively more stability not only in domestic food generation processes but also in the form of less vulnerability to external shocks and less mal-nourishment.

An important pattern that emerges with regard to targeted policies in ensuring food security within the region is that not only have the low food deficit countries been successful in controlling undernourishment within their population to negligible levels by the year 2015 (as per the MDG requirements), but they have also made more significant advances against chronic hunger than the high food deficit countries. Similarly, not only are the average percentages of children with wasted, stunted and under-weight growth in the low food deficit group comparatively less than the high food deficit countries, but there has also been a higher rate of decrease and hence progress within these countries towards achieving the SDG hunger target than the high food deficit group. However, obesity and stunted growth remain a problem for the low food deficit group. This is evidenced by the fact that the proportion of children with stunted growth remains high with lowest incidence of 7.1 percent for Iran, 19.6 percent for Uzbekistan and increasing incidence of overweight children in Turkey, Azerbaijan, Kazakhstan and Iran and there exists a need to have a proactive policy focus to counter such tendencies.

In the context of food access, we do find that on average the countries that have successfully fulfilled the MDGs have relatively more pro-poor growth process than those that could not meet these targets by 2015. This emphasizes not only a fundamental role of policy efforts in tackling hunger issue within ECO region but, by reinforcing the recognized pathway within MDG 1a and 1c targets, highlights the wider debate on the link between reduction in extreme poverty and reduction in hunger incidence. However, from the experience of countries in both the low and high food deficit ECO regions, another pattern that emerges is that process of poverty alleviation has been much faster as compared to reduction of hunger. Hence it is important to go beyond the mere connection between reduction in extreme poverty and hunger alleviation to structural difference within society to devise an inclusive and sustainable growth mechanism.

With above key findings in perspective, we will divide policy discussion in the following two parts. Part 1 focuses on defining policy direction to eradicate hunger from ECO Region. In this section, in light of the policy messages from experience of countries that have effectively curtailed hunger both within ECO region and from international experience outside ECO region, we will try to bring different policy viewpoints in efforts to fight hunger (both in its transitory and chronic forms together). This discussion will help define key policy directions for countries within ECO region that are still facing high food deficits and food inadequacies.

4.3. Global Debate on Policy Directions to Eradicate Hunger

What should be the policy discourse in ensuring food security in a country or in a region is a complicated issue. The formulation of policies to ensure food security requires a deep analysis of country specific constraints and their connection to international demand and supply mechanism not only in terms of food but also in terms of global economic stability. So any policy discussion within ECO region on how to eliminate hunger both in its level and also in relation to its deeper determinates of food utilization and absorption within a country and across countries, firstly requires a discussion on how global economic mechanism may affect the food security within a country or region; and, secondly, how different sectors within an economy interact with each other to produce various outcomes – that is how agricultural and macro-economic condition integrate within a country to produce such an end. To develop an understanding of such synergies both within an economy and across economies in tackling food issues in terms of sufficient and secure availability of safe and nutritious food within ECO region, let us place the discussion in the context of the following three policy viewpoints:

i. Productionist view

ii. Market led development (donor perspective in countries receiving food aid)

iii. Inclusive growth/Developmental view

These viewpoints are prevailing in the international arena in the fight against hunger and their brief introduction here will allow us to chart out a policy discussion for the ECO region in the light of these narratives.

4.3.1. Productionist Perspective

The Productionist viewpoint focuses on increasing agriculture production to ensuring food security. The traditional view in this perspective is to ensure self-sufficiency in food production especially that of staple crops. The stress of this view is on availability; i.e. if there is sufficient food production within country then it will remain food secure. At first glance, this policy view point seems to be linked to sufficient availability aspect of food security only, however when looked carefully one realizes that the deeper question within this policy perspective is not just about enhancement in availability of food through enhanced domestic production but is also about augmenting the incomes of the farmers that are producing such staple crops. How this policy will impact an economy will depend on two factors namely: land distribution within the agriculture sector and structure of urban and rural poverty.

That is whether land is primarily in hand of a few large land lords or is predominantly based on small holder agriculture/subsistence farming (Ivanic, Martin and Zaman, 2012). If the latter is true within country along with poverty being centered mainly in rural areas (ibid), then above policy is indeed just not about country becoming self-sufficient in its basic food requirements through increase in domestic availability but also about poor people having affordability to purchase food. In such cases diversification into high value crops - a policy option that is being advocated in international policy circles is a valid policy (Joshi *et al.*, 2007).

Within this policy perspective, each country faces a trade-off in the use of agricultural land, i.e. whether to invest in food crops or in cash crop. Food crops are essential for securing the basic food requirements of the population (in terms of domestic supply for rural as well as urban populations and for subsistence of poor farmers. On the other hand, investment in high value-added cash crops such as fruits and vegetables yield their own benefits, not directly linked to food supply, but still of importance to farmers, especially those at the poorer end of the spectrum.

At a macro level, cash crop production can clearly act as a more effective means of revenue generation that can be used for food import in case of food shortages, and at micro-level it can generate incomes for poor farmers to a greater degree than comparable investment in food crops. Therefore, how a country seeks to secure food availability essentially depends on these two alternative policy options. In the context of ECO member countries, we find that there exists policy inertia against such diversification both at macro- and micro-level in all the three high food deficit countries[24]. In contrast, the low food deficit countries have opted to implement both types of policies for self-sufficiency and diversification (such as in the well documented case of Azerbaijan), while others, such as Uzbekistan[25], Kyrgyzstan[26] and Kazakhstan[27] have chosen to focus their efforts on

[24] For Tajikistan see: FAO Regional Office for Europe and Central Asia (2015).
See Qureshi, Ghani and Qureshi (2007) for detailed analysis and discussion of policy inertia against the policy of diversification to high value crops within Pakistan.
For Afghanistan see: Kelly (2003) and Pain and Shah (2009).

[25] Under a policy of self-sufficiency, Uzbekistan increased its wheat cultivation area by 196 percent between 1991 and 2006, even moving most of irrigated land resources away from high value crops such as fruits and vegetable to wheat cultivation (FAO Regional Office for Europe and Central Asia, 2015).

[26] Kyrgyzstan: FAO Regional Office for Europe and Central Asia (2015).

achieving food independence through a portfolio of legislations and laws and subsidies for input procurement as well as net food buyers (FAO Regional Office for Europe and Central Asia, 2015).

The question that comes to light then is why has there been reluctance within member countries, in particular in Pakistan and Afghanistan, to the implementation of the second option despite the positive outcomes and substantial potential of such efforts in Azerbaijan and other countries globally. Current literature on this issue of inertia has highlighted two reasons. Firstly, due to prevailing thought that reliance on international market both as a place to sell high yielding cash crops and to cover domestic food shortages can create instability within a country as was observed in case of food price shocks of 2007-08 and 2010-11 that were generated in international markets. Secondly because both these countries are predominantly agriculture based with dominance of small scale agriculture in Pakistan (Pain and Shah, 2009; Spielman *et al.*, 2016).

In the case of first view, the traditional consensus was that instability can transfer from international to domestic markets, but more recent research suggests that global trade is an effective way to stabilize the domestic system[28], hence this policy option should not be rejected. However, the real reason of concern in this respect is the question of how subsistence farmers will (already facing food vulnerabilities) be adjusted in such a shift of

[27] Kazakhstan: FAO Regional Office for Europe and Central Asia (2015).

[28] Hazell, Shields and Shields (2005) document more instability in the impact of domestic price variations as compared to what is generated in response to variation in global prices.

policy from staple to cash crops. Such farmers will be able to earn substantially more when they shift towards high value crops but in case they do not with meagre land size of <2-hectare, reliance on cereal crops will mean they cannot support even their basic dietary requirement. For this reason, it is not an easy option to pursue due to the risk involved given that the shelf life of such foods is very low (Joshi *et al.*, 2007). Unless there exists institutional support in filling the missing links within the vertical integration chain from storage facilities to distribution, such a policy shift cannot materialize effectively in high food deficit countries. Not to mention the fact that such a shift will also require easing of access to credit as well as farming techniques that ensure quality standards in production. Hence in this context, domestic conditions for production matter a lot as do trading patterns and the institutional support provided to farmers.

4.3.2. Market Led Growth / Donor Perspective

The market led growth or donor perspective on food security policy in the international arena, though not necessarily important for the majority of ECO member countries, needs to be mentioned here due to its relevance for Afghanistan (the country has had a major reliance on aid for the last several decades). For example, Pakistan has also relied on donor support in many forms through negotiations with IMF and USAID when faced with man-made crises such as terrorism or natural disasters such as floods and earthquakes. Within donor advocacy, the predominant factor is advocacy of the free market mechanism. The epitome of this viewpoint was the Washington consensus and is most prominent within advocacy of aid from the US. Other sources of aid also emphasize the free

market mechanism, but it is tempered with support for the pro-poor growth mechanism by promoting various safety net programs (Pain and Shah, 2009).

These safety net programs promote equity through various poverty reducing measures such as conditional/unconditional cash grants etc.[29]. However, within this process of market led growth, government involvement remains an important factor for two reasons. Firstly, if markets are left unchecked there will most likely emerge high levels of inequality and secondly, no doubt efficient and well-functioning markets are the most essential aspect for growth, but markets are liable to fail and in such circumstances the government and policymaking can play the role of smooth facilitator creating coordination to achieve socially desirable results. This clearly suggests that there should be an emphasis on private sector role in initiating growth but with a realization that their prime objective is profit maximization and not welfare of society at large and hence to keep this very thinking in check the proactive role of government in creating right incentives for private sector for their investment and at the same time ensuring that such growth will remain pro-poor is essential.

This theme of growth with ensuring equity through poverty reducing measures can be also linked to the thinking behind MDG (and now progressing into SDG) targets whereby there is subtle indication that hunger is primarily a problem of access and unless poverty is

[29] Pakistan's Vision 2025 documents avenues of growth through provision of incentives for export led growth and increased opportunities of private entrepreneurship within a stable government governance while to counter the possibility of inequalities that may emerge various poverty reducing measures have been suggested.

pro-actively handled, hunger will not be eliminated. In the present context we have also found strong empirical support in favor of the poverty and hunger reduction nexus. It is abundantly clear in the preceding analysis that countries which have low food deficits have much more pro-poor structures, while the countries that are food insecure have relatively higher poverty levels and processes that are less conducive to poverty reduction. Hence this points to strong support for poverty reduction as a key aspect in reducing food insecurity. This was the idea behind placing reduction of poverty and undernourishment as two parts of Goal 1 within the MDG targets.

It is important to emphasize that there exists a contrast between the Productionist and Donor Support view in as to how to achieve such poverty reduction target. In this context, the first view of increasing the availability of production of staple food assumes that in due process the incomes of poor farmers who are growing such crops will increase thus lifting them out of poverty and under-nourishment. The latter view stresses that there should be direct support to poor and that these vulnerable groups need to be identified and targeted through conditional and unconditional grants. Theoretically the latter approach of targeted grants is based on Bhagwati's rule of policy making where it has been emphasized that if one wants to handle something one should try a policy that remains as close to the problem as possible. Given that food insecurity is a problem of access in the ECO region, hence trying to control this problem through indirect measures such as producer or consumer subsidies will help alleviate the symptoms somewhat but will not resolve the underlying problem (Bhagwati, 1969). In this viewpoint there is a need to handle the

problem of poverty first and inclusion foremost given this is the source of undernourishment and then move to other elements of food domain.

Further there exists a vicious circle in this regard in the sense that the capacity of the state to provide for the poor population also depends on how strong the domestic economy is not only in terms of GDP growth but also in terms of other macroeconomic indicators. For example, if the state is bearing large and persistent fiscal deficits and/or relying on external debts, then definitely a cut will be made in its developmental budget in due time. Also, the level of integration of a country with the global economy and the structure of its exports and imports will have consequences not only for its foreign revenues but also for the stability/volatility of prices within its borders. It is important to realize how macroeconomic stability of a country not only creates overall governance structures for growth to take place but also defines the opportunities and extent of poverty alleviation measures.

The earlier discussion has highlighted that countries that have high food deficits had on average lower levels of GDP per capita and much higher levels of poverty. These higher levels of poverty are manifested in higher poverty levels as well as lower rates of poverty elimination. This clearly points to weak efforts both in terms of poverty eradication in these countries and in terms of maintaining less conducive macroeconomic conditions. In this context in next section, it will be demonstrated how low and high food deficit regions differ from each other not only in their /income levels and poverty structure but also in

terms of macroeconomic conditions that lead to such an outcome including situation of external debt, reliance on aid, and extent of foreign direct investment etc.

4.3.3. Developmentalist Perspective

This policy view is most compelling and forms the base of Sustainable Development Goals (SDG) consensus internationally. These goals have been devised to ensure development that can be sustained socially, economically as well as environmentally. How such a focus is related to hunger elimination both in its transitory and chronic forms can be understood in the context of emerging empirical evidence that shows that contrary to past concerns of undernourishment as a result of food unavailability, the root of the problem now lies in lack of food access both in terms of affordability and also in terms of not having conducive conditions for proper utilization of food at individual and household level where such concerns materialize in more tangible ways (a finding that is considered as valid for the ECO region as well). Policy discussion regarding food security is necessarily moving from undernourishment to the initial conditions that drive such results and to correct such constraints requires two measures. First, effective implementation of inclusive structures (both social and economic), and second sustainable production techniques. The former is the most fundamental element in the fight against undernourishment, while the latter will ensure environmental sustainability within the food generation chains – a factor valid not only for the present but also for future food security concerns and hence both cannot be ignored.

Within this perspective, there is a realization of the importance of sustainability on many fronts such as conservation of the environment and in terms of correcting structures that lead to transmission of poverty and lack of access to food overtime within a country or region. Within this analysis we find that the Productionist and market-led development views are not mutually exclusive but are pieces of a larger policy question concerning initiation of a growth trajectory that can generate food security within its own dynamic. The policy paths to a hunger free and developed economy are diverse and there could be mix of many strategies that can lead to such an end. As the debate within Productionist view suggests, one aspect is the question of self-sufficiency versus diversification while another is growth through free market mechanism with careful government regulation. However, an important point for our discussion in the context of sustainable development point of view is how to correct institutional and economic systems in such a way that they become structurally inclusive in all aspects. If policy makers can successfully implement such a mechanism, then it will automatically deliver the benefits of growth to vulnerable groups by not only making growth pro-poor but also nutrition sensitive. A number of dimensions have emerged in the international literature that are important means of achieving inclusive growth and these can be integrated within a framework with the two policy perspectives discussed earlier.

4.3.3.1. Agriculture Growth and Pro-Poor Growth

The objective of achieving robust economic growth always has occupied a central place in any policy outlook. However, from the sustainability point of view, not only does growth matter, but quality of growth as well. The latter is an essential factor from the

perspective of how benefits of growth are being distributed both across sectors and across different socioeconomic groups and regions. The prime theme across these concerns from food security point of view is that growth needs to be pro-poor in the sense that it must enhance welfare of the poor either proportionally more than or at least same as that of the non-poor group. In this context agricultural growth takes prominence. This can be inferred from the large body of empirical evidence showing that agricultural growth has not only been found to be pro-poor in terms of raising income levels of the lower quintile, but also has been more effective in poverty eradication (Chenery *et al.*, 1979; Lipton and Ravallion, 1995; Eastwood and Lipton, 2000; Christiaensen, Demery and Kuhl, 2011). This evidence is even more evident in the case of developing countries where the locus of poverty is primarily in the rural areas (Lipton, 1977; Chenery *et al.*, 1979). Clearly sectoral compositions of growth need to be assessed and important linkages and interaction across these sectors should be identified to understand the totality of the process through which the agriculture sector can act as a game changer for eliminating poverty and limited access of the poor to safe and nutritious food.

Consider now why the agriculture sector is so important in the achievement of food security and how macroeconomic factors can create a conducive environment for strong growth momentum in the agriculture sector. If the important interactions between various sectors (particularly between the agricultural and industrial sectors) can be identified both in terms of income and employment generation processes within an economy and production and consumption patterns, it will have important implications for domestic and international commerce. This will at one level help us to understand how countries that

have developed over time have benefited from such positive interconnections and at a second level in identification of these synergies across the agricultural and overall macroeconomic environment in which such growth takes place. We can then highlight how the first two policy viewpoints can work together to create inclusive growth.

4.3.3.1.1. Agriculture Growth and Food Availability

This is the most obvious link as agricultural growth directly defines the food limits in the country. However as pointed out in policy view point 1, an important issue is what types of crops are being produced. For example, cereal crops not only directly augment the food base of households (and of economy) but also generate income for a family unit too, whereas crops like coffee or sugar mainly act as means of income and employment with very little contribution in the food consumption basket of a household. Hence reduction of hunger through adequate food availability requires serious policy discussion as to what is an efficient composition of crops for an economy not only in the context of its geographical constraints but also as to which combination will yield most return in terms of overall growth. The latter element is extremely important as the growth path of every economy may be different in response to its crop production mix and since external and domestic demand may vary by product, hence net effect on an economy in context of food security and poverty reduction can very well be different across countries depending on the composition of their agricultural produce (Diaz-Bonilla, Orden and Kwieciński, 2014).

Hence a policy focus on either self-sufficiency or diversification into high value crops to initiate export led agricultural growth or their combination needs to be judged

within a country specific context. In contrast to emerging evidence for positive impact of export led agricultural growth in recent years (as was pointed in policy view point 1), for the case of eastern and southern Africa, Diao *et al.*, (2007) found substantial empirical evidence against such a policy and in favor of investment into staple foods only as it has been found to generate more agricultural growth in face of their vibrant and growing domestic non-farm economy (which creates demand) and with prevailing minimal marketing costs associated with domestic trade of such crops. Hence there is no clear-cut answer as to which policy path, that is either self-sufficiency or diversification, should a country take as such a policy decision will largely depend on how an economy's domestic food supply interacts with its food demand base (both in terms of domestic and global demand).

The above policy dilemma is also reflected in the case of ECO countries that have been able to achieve secure food outcomes for their populations. Among countries that have successfully eliminated hunger as per MDG targets within ECO region Kazakhstan, Uzbekistan and Kyrgyzstan have been documented as following only the path of self-sufficiency while Azerbaijan achieved these targets through a mix of such policies; i.e. diversification along with investment in stable foods (FAO, IFAD and WFP, 2015). Hence both such policies can lead an economy to the same end of being in low food deficit category and there is again no clear-cut answer as to which policy path a country needs to pursue. Further given that ECO countries differ not only in their macroeconomic and demographic structures but also in their geographic content, hence what is the right policy balance within these two viewpoints, that is whether to invest in food or cash crops or

both, will depend on their local constraints along with their capacity for export. In this context, there is a need to systematically analyze what kind of crops are being produced country wise and what are their trade pattern along with their consumption pattern - a discussion that will be taken up in the next chapter.

4.3.3.1.2. Agriculture Growth and Food Access

Creating economic and physical access to food is the most critical dimension in countering undernourishment in recent times. At economic front for achievement of this target primarily requires pro-poor growth - growth that is equitable and ensures job creation with the aim to bring the majority of population in work force to empower them with means to support themselves effectively. However, there is no one way to achieve such an end and there has been constant debate within policy circles as to which sector, that is industrial or agricultural sector, can play such a role. Initially till 1970 there was emphasis on poverty reduction through investment in agricultural and rural development[30] but post 1970 till 1990 sectoral policies took prominence and by 1980s it became clear that that there is indeed an incentive bias against agricultural development due to trade and macroeconomic policies that favored urban sector[31] (Krueger, Schiff and Valdés, 1988; Krueger, 1991; Bautista and Valdés, 1993; Schiff and Valdes, 1993; Bautista *et al.*, 2001). This emphasis away from agricultural growth to growth in other sectors of the

[30] Chenery *et al.*, (1979) provide a detailed analysis of how agricultural and rural development is critical for poverty reduction.

[31] The term urban bias in development planning within developing countries had first been used in research by Lipton (1977), while more recent work building on this tension across rural-urban region and industry versus agriculture has been done by (Majumdar, Mani and Mukand, 2004) using an information theoretic approach.

economy had its base in the paradigm of Import Substitution Industrialization (ISI) which had started to captivate the minds of policymakers in most developing countries post World War II. Under the ISI school of thought, the dominant belief became that the role of the agricultural sector was not for the purpose of employment and income generation but more so as subordinate to the needs of industrial sector and urban population. The crucial role of the agricultural dependent rural economy as defined under this policy framework was firstly of providing a sufficient work force through transfer of cheap labor from agricultural to industrial sector and secondly to act as an impetus for industrialization by providing the inputs (raw material) for production and a vibrant pool of domestic demand for industrial products and/or a means of savings and revenue generation through exports to finance industrialization[32]. Further proponent of ISI emphasized how a shift away in trade from agricultural to industrial exports will not only generate more stability but also will protect them from losses from the unfavorable terms of trade for countries relying on agricultural exports, especially primary goods (Prebisch, 1968).

More recent research in favor of ISI (including Krugman, 1994) has argued that industrialization can move an economy towards a relatively higher growth path through a combination of factors including economies of scale, strategic complementarities, technological spillovers, pecuniary externalities and greater backward and forward

[32] The key process as pointed out in the pioneering work of Johnston and Mellor (1961) on how agricultural sector may support industrialization beside transfer of labor to industry and provision of food items and agricultural raw materials included use of both accumulated domestic savings from rural sector and generated foreign revenue through agricultural exports as a finance of industrial investments such as machinery and intermediate inputs.

linkages. All such views contributed to a policy bias against agricultural dependent rural economy. The urban population in most developing countries was favored not only in the sense of offering lower prices of food for urban consumers, but also in terms of allocation of more resources to non-agricultural sectors[33].

This pro industrial approach of development over the years led to the belief that it has not only resulted in massive increases in poverty levels within the developing world but also in either rates of poverty reduction that are at best slow and at worst non-existent. Firstly, this pattern has been observed in most developing countries where a proportionately larger share of population is based in rural areas and poverty is centered within the rural domain and hence a poverty alleviation program is incomplete and ineffective without proactive strategy for countering such rural poverty (Lipton, 1977; Chenery *et al.*, 1979)[34].

Secondly there has been strong empirical evidence of dynamic multiplier effects of agricultural growth on rest of the economy with much higher pro-poor mechanisms[35] while the bias in policies against agriculture sector (for instance in the form of lower product prices for farmers or in terms of an over-valued exchange rate) have been found to

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[33] Though ISI has lost steam of late, the allocation of funds in relatively higher proportion to urban sector continues in the majority of countries due to much stronger influence of urban political groups as well as the paradigm of the urban sector as an engine of growth (see Planning Commission of Pakistan, 2011).

[34] This does not undermine the significance of urban poverty, rather shows that in issue of resolution of poverty from an economy, it is important to understand how it is structured so that can policies can be framed accordingly.

[35] Haggblade and Hazell (1989) and Haggblade, Hazell and Dorosh (2007) document positive sizable multiplier effects of agricultural sector on different sectors of economy.

stifle pro-poor growth. Similarly, while agricultural producers have been found to be working below their potential, which in itself results in efficiency losses in response to such incentives, but this process has been reported to slowdown outward growth of the production possibility frontier (Krueger, 1978; Balassa, 1989; Balassa and Michalopoulos, 1989). Empirical evidence shows that over-protection of industrial units at the expense of agricultural sector in the form of tariffs and various market interventions can result in supply constraints that create an uncompetitive composition of total production (ibid). Further, such industrial protection has also been observed (between the 1960s to 1980s) to result in a negative price bias against agricultural goods both in terms of agricultural exportables being heavily taxed and agricultural importables being protected (Krueger, Schiff and Valdés, 1988; Schiff and Valdes, 1993). All this international research evidence shows that the focus away from agricultural sector to capitalist industrial sector has not only affected the whole economy negatively by creating productivity lapse within the rural economy but also by ignoring the consequent negative impacts on distribution of wealth (especially in the case of rural poor given that their sector had slowed down) that adversely impacted the vulnerable groups and hence their ability to acquire food. This trend eventually made it evident that agricultural and rural development is the backbone on which poverty reduction can take place.

Over the years the failure of capitalist industrial growth to accommodate the concerns of the poor and food deprived population has become evident while other alternative policy paradigms have also emerged which show that industrialization at cost of other sectors is not a positive solution rather the efficient use of resources in all sectors

of economy through technological improvement is a better option from pro-poor end. An important caveat in this regard is the fact that developing countries tend to have limited resources available for development purposes, so choices must be made, and sectoral growth prioritized.[36].

In this context, there exist two exemplary precedents: first is the case of the green revolution and second is the East Asian miracle of growth (Barichello, 2004). In both instances, high periods of growth were initiated through heavy investment in the rural economy, whereby in the green revolution the focus was on improving agricultural productivity through use of fertilizers and new varieties of seeds while in case of East Asian countries there was massive investment in human skill development (both of rural and urban population) and with export led growth under government regulation and promotion. Coupled with a strong agricultural base, and conducive global environment, these countries were able to increase prosperity of the whole economy. This encompassed both rural and urban regions and their different socioeconomic groups to the extent that these countries have shifted their status from developing to newly industrialized economies.

These two historical instances support the idea that there can be a technological solution to rural problems and that food access for both rural and urban poor can be enhanced via such measures. This is so in the case of the green revolution; the agricultural

[36] however, that does not imply other sectors should be ignored in policy making.

growth had not come through policies that subsidized farmers at the expense of other sectors, which generally would have raised food prices, but through improvements in technology and hence such growth patterns emerged that ensured that agricultural production increases (and hence incomes of farmers and their ability to access food) along with decrease in price of food items as supply increased (hence enhancing the welfare of net buyer of food in both rural and urban sector). In the case of the East Asian countries, the export led agricultural growth with massive investment in human capital totally transformed the skill base of the countries and hence their ability to access food.

4.3.3.1.3. Agriculture Growth and Stability in Access to Adequate Food

The agricultural sector has an important role in creating a stable environment for households and individuals in their access to food. The most obvious channels through which this impact materializes is through the effect of food prices on welfare of both food net sellers and net buyers (Meerman and Aphane, 2012). However, the price channel is not the only piece of puzzle that matters (though it is the one most publicized) and there are other sources of instability that are of crucial significance such as harvest loss due to pest attacks or due to natural disasters etc. The stability of households' access to food (both that of food producers and consumers) is affected not only by price shocks but also by other sources of income disruptions that may come in face of unemployment, health shocks, conflicts (wars, terrorism etc.) or disruption of food supply due to climatic reasons or natural disasters. These shocks impact both the farmers as well as the net buyers of food as prices will change accordingly(Sinha, Lipton and Yaqub, 2002; FAO, IFAD and WFP, 2015).

Hence, policy measures need to be put in place to insulate poor households from both price and non-price-based vulnerabilities.

From an agricultural policy point of view, the most important and immediate policy instrument deals with food pricing whereby the crucial question is to figure out that optimal price level which may generate the right incentive for farmers to keep working at efficient levels and does not undermine consumer interests. The most important dilemma in the policy arena is how to balance these two opposing policy concerns; i.e. high and profitable price for food producers and low and affordable prices for consumers (Timmer, Falcon and Pearson, 1983). In this respect one argument is that high food price may impact the consumer badly in the short term but once the second-round effects are considered in medium to long term, high food prices will not hurt consumer interests provided these are instrumental in boosting productivity thereby raising wages and income growth. This differential effect of food price increase has been documented (Ivanic, Martin and Zaman, 2012) in a sample of 31 countries: in the short term there is an increase in level of poverty after a 10 and 50 percent increase in food prices in 27 and 29 countries respectively. However, after some time when the whole dynamic effects on production and consumption patterns have taken place, the impacts are reversed resulting in an overall decrease in poverty levels in 27 countries after the 10 percent price shock and 22 countries after a 50 percent price shock. There are also some technical issues that need to be taken into account in this context. For food producers, the most relevant variable is price in level and for consumer the price in level impacts the cost, but the important variable is persistent inflation rate and price shock that affect their behavior (Easterly and Fischer, 2001; Diaz-

Bonilla and Ron, 2010; IMF, 2012; Kottam, 2013). Therefore, not only is an assessment of the price level important but its trend, rate of change and variability is also of crucial significance along with identification of episodes of price shock and how an economy responds to such a shock.

The foregoing discussion provides important insights for the empirical analysis across high and low food deficit ECO regions in next chapter, where we will try to not only evaluate the extent of household vulnerabilities both to non-price sources of shocks to household income such as climatic conditions etc. across these partitions[37] but also will try to assess the extent of global price shocks by assessing how food prices evolve in level and also its rate of change in different ECO countries. The evaluation of how food inflation has evolved over the years is extremely relevant for ECO region especially in the context of the four central Asian countries namely Kazakhstan, Kyrgyzstan, Uzbekistan and Tajikistan that have been shown to be impacted to much larger degree than other countries in the world by the recent global food price shocks of 2007-08 and 2010-11 within the literature (Akramov and Shreedhar, 2012; IMF, 2012).

[37] In the context of household vulnerabilities to non-price shocks, a relevant finding from previous chapter is highlighted that show that countries in low food deficits regions on average have a much more stable political environment and also have much lower percentage of population exposed to droughts, floods and extreme temperature and terrorism as compared to high deficit regions (see Chapter 1: Appendix Table 28). This suggests that on average households in low food deficit countries are more protected from risks associated with food access in the form of political instability, terrorism or natural disasters.

4.3.3.1.4. Agriculture Growth and Effective Food Utilization and Absorption

The utilization and absorption of food depends on quality of food as well as on protection of population from diseases. In this case the curative and preventive care in the form of proper sanitation facilities in household and their access to good health care providers are all important contributing factors. Improvements in agricultural sector will impact the food availability and its quality and through its contribution towards export earnings or agricultural taxes can serve as an effective means of government revenues which can be then used for financing poverty alleviation programs, provision of public goods like health and public hygiene, and enforcement of good food standards within an economy. Hence investments in agricultural sector besides being an active source of creating food secure outcomes in sense of first three dimension of food security will also positively impact its fourth dimension by generating avenues of effective food utilization through its indirect contribution to both health care system and maintenance of quality of food within an economy.

4.3.3.2. Rural Development and Pro Poor Growth

Till now we have focused on agricultural growth and how it plays an important role in fulfilling the four dimension of food security, however we should not forget that agricultural growth takes place within a macroeconomic and institutional framework and that there exist strong interconnections, whereby the positive developments within the agricultural sector feed into more macroeconomic stability and overall economic growth and vice versa. So, in totality of the process, all such developments are part of the loop (that is Policy Viewpoints 1 and 2 are linked) and within this loop one important aspect which

completes such interaction and is of critical significance is the context of the rural non-farm economy and its role in facilitating such connections. On the economic front, the vibrancy of this non-farm rural economy will define the extent to which agricultural sector will be connected to both domestic urban demand and also international demand since actors in agricultural value chain such as traders and facilitators will emerge from this sector and they will play a key role within the food distribution system (Diaz-Bonilla, Orden and Kwieciński, 2014).

This is so because the farmers are part of the supply side and it is the extent of demand, whether domestic or international, that will define their incentives to produce and invest. Farmers can be poor in this scenario, but if they are efficient and do not see their investment materialize into profitable enterprise whether through negative price bias against them to support the net buyers of food or due to weak demand, they will respond to such signals by producing below their potential (Schultz, 1964). Therefore, rural development should not be the sole focus since mostly poor are situated within this sector but to avoid such efficiency loss it is important that right institutional support should be in place to encourage investment in both physical infrastructure and in human capital accumulation within the rural sector. Such investments will boost the activities of both farm and non-farm sectors and create incentives for private businessmen to invest in creating links across rural and urban markets. Both agricultural and non-agricultural policies are required within the rural side to create the right enabling environment for inclusive growth to take place.

4.3.3.3. Macroeconomic Stability and Inclusive Agricultural Growth Structure

How resilient is agricultural growth in creating and sustaining inclusive social and economic structures is largely dependent on the macroeconomic environment in which such growth takes place. In economies which are primarily agriculture based and where the agriculture sector has a significant share in GDP, the growth in agricultural sector has huge consequences for macroeconomic stability. Hence our discussion on food security policy analysis will remain incomplete if we do not give due attention to this link across agricultural sector and macroeconomic policies and how the varied combination of the latter may cause differential impact on the extent and quality of growth (across both rural and urban sectors). Therefore, to formulate a viable policy prescription for any economy, it is important to understand the framework in which macroeconomic policies interact with outcomes in the rural sector through their influence on rural infrastructure (such as transport connectivity, communication systems, irrigation and so forth and/or their impact on public goods such as peace and security as well as avenues for health care of the population. In addition to these, achieving macroeconomic stability through effective trade[38], fiscal[39], monetary[40] and exchange rate[41] policies has important consequence for agricultural growth since all these policies impact rural farm and non-farm activities in one

[38] Trade focused Computable general equilibrium models are presented in Robinson, El-Said and San (1998); Harris and Lee (2001); Lofgren *et al.* (2001); Lofgren, El-Said and Robinson, (2002) show how trade policy has consequence for agricultural outcomes.

[39] World Bank (2017) provides a link across improved public expenditure and agricultural growth - a nexus that is largely dependent on how effectively fiscal policy is managed within a country and within frameworks how funds are allocated to various developmental objectives.

[40] Muroyiwa *et al.* (2014) show how monetary policy through its impact on interest rate and general macroeconomic environment has consequence for agricultural growth.

[41] Krugman and Taylor (1978); Krugman (1979); Robinson, El-Said and San (1998); Jensen, Robinson and Tarp (2002); Kristinek and Anderson (2002) provide theoretical links on how exchange rate policy impacts agricultural sector performance.

way or another. For example, access to credit is largely a monetary issue and hence strengthening of financial institutions in the rural economy will ease this constraint for both farmers and rural businessmen and can help in the operation of agricultural value chains. Similarly trade policy and exchange rate policy will again directly impact the incomes and incentives within rural economy.

A devaluation at one level will enhance the incomes of farmers who are engaged in agricultural exports, however at the same time this may act as a negative impetus to their non-tradable incomes (Krugman and Taylor, 1978; Krugman, 1979; Jensen, Robinson and Tarp, 2002; Jensen and Tarp, 2005). Investments in technological improvement and the subsidies that are given out to consumers or farmers directly depend on fiscal constraints within a country and both these factors will have consequences for farmers. Agricultural growth is also directly impacted by extent of domestic and international demand for agricultural products and to ensure vibrancy in such demand, stable and sound macroeconomic policy management has an important part to play since these policies not only define the employment and income scope of the population and opportunities of trade with countries but will also protect a country from external economic crises. Thus, all macroeconomic policies in one way or another have intended and unintended consequences for agricultural sector[42] (Bautista *et al.*, 2002).

[42] At a practical level widespread use is made of Computable General Equilibrium (CGE) models in development planning to account for the inter-linkages across various macroeconomic policies on agriculture and vice versa. Johansen (1960); Sandee (1960); Hertel (1997); Wobst (2001); Jensen, Robinson and Tarp (2002); Jensen and Tarp (2005); and Dixon (2006) are examples of application of this technique.

In the context of ECO region, we can see that macroeconomic stability is indeed a crucial factor for attainment of hunger targets. From the patterns of how poverty levels and undernourishment have evolved within the ECO region for the 1992 to 2015 timeframe, we can see that in case of Central Asian countries they were initially facing high levels of both poverty and hunger till early 2000. At this time their economies were in a turmoil in terms of their macroeconomic condition and it is only in subsequent years after positive macroeconomic structural reforms that they have started to show positive progress towards MDG targets[43]. In the case of Pakistan and Afghanistan, there is a lapse in agricultural productivity in last few decades (Pain and Shah, 2009; Spielman *et al.*, 2016). It is important in this context to assess this pattern against the whole macroeconomic environment since it is evident that having resilient and meaningful agricultural growth is important requires a stable and conducive macroeconomic environment.

4.3.3.4. Structural Transformation in Economic and Social Spheres

For sustainable and inclusive growth to take place in an economy, it is important to identify the structural constraints in economic and social setup that may define the boundaries within which that growth takes place. A number of such factors are of significance in this context.

First, what is the locus of poverty within the economy? This is a classic question that has captivated the minds of economists as evident in the work of Chenery *et al.* (1979).

[43] Extent of food access within Central Asian countries pre- and post-2000 is given in FAO Regional Office for Europe and Central Asia (2015).

However, this query has great significance even in present context especially in planning pro-poor policy initiatives. Traditionally in developing countries, poverty has been primarily a rural phenomenon. However, with development and with increased trends in migration towards the urban sector, there has been emergence of urban poverty at a much higher rate. Therefore, it is important to assess within the ECO region not only the relative shares of rural and urban population in total population but also where the issue of poverty and hunger is situated.

Second, it is important to identify the structure of land concentration within the rural sector in an economy. In contrast to research that supports the substantial adverse impact of price shocks on poverty indicating much greater incidence of net buyers of food within an economy[44], Ivanic, Martin and Zaman (2012) evaluated poverty dynamics in the aftermath of food price shock of 2010-11 and found evidence of a decrease in poverty levels even in the short term within Vietnam. This finding is contrary to evidence where the poverty level exhibits an upward trend in the immediate aftermath of a food price shock as reported in Ivanic and Martin (2014) and in the case of other countries besides Vietnam in Ivanic, Martin and Zaman (2012). A close evaluation of this divergent pattern of the impact of food price shocks in Vietnam in contrast to other countries is found to be primarily due to its varied structure across rural and urban populations than the rest of the countries where there existed a dominance of rural poverty with higher concentrations of net food

[44] This finding refers to short run impact of price increase on poverty levels which primarily capture the impact on net buyers of food and not the medium to long run time frame impacts which may be different than short term results (Ivanic and Martin 2014).

producers within the rural economy. Hence an increase in food price shock was more in favor of the poor food producers resulting in fall in poverty level after such a shock.

Third, the structure of rural sector in terms of its both farm and non-farm community is important not only from a pro-poor policy angle but also from the perspective of environmental sustainability. For example, what sort of farming style is present; i.e. large-scale versus small-scale farming, will affect not only what kind of policy incentive needs to be in place from a poverty alleviation point of view but will also define the scope of environmental concerns as the techniques that will be applied in production will be different and so will be the opportunities for credit access for the farmers (Pitt *et al.*, 2003; FAO, IFAD and WFP, 2015). Hence, this is also an avenue that needs to be assessed both in terms of type of farming and in terms of environmental condition – a discussion that will be taken up in next chapter.

Fourth, how linked are rural and urban markets both in terms of physical infrastructure like roads, rail tracks etc.[45] and in terms of institutional support for storage facilities for perishable crops. Moreover, the strength of financial institutions and their differential degrees of penetration across rural and urban domain is an important element that needs to be assessed within ECO context.

[45] In context of indicators of infrastructure like percentage of paved roads, road-densities and rail-densities, within ECO region, we cannot see any conclusive pattern in this context that can differentiate the countries within low and high food deficit categorization (Chapter 1: Appendix Tables 23a to 25b).

Finally given that females are the prime care takers of the children, elderly and household in general, their empowerment in terms of their education and awareness and political representation is an important link for nutritional outcomes[46] and needs an evaluation within the ECO context. Here it is important to revisit the findings from previous chapters which reemphasize this very point by showing much higher degrees of female empowerment in terms of their schooling and labor market outcomes within the low food deficit region than the countries which have failed to fulfil MDG hunger targets (Chapter 1: Appendix Table 22).

4.4. Conclusion

Locus of hunger and malnourishment within ECO region is primarily in three high food deficit ECO countries; namely Afghanistan, Pakistan and Tajikistan, while the rest of the ECO countries have effectively handled the issue of undernourishment but are now facing other health risks due to excessive nutrition and obesity. Hence both these regions have different sets of policy issues, where the prime policy challenge for Afghanistan, Pakistan and Tajikistan is to find an effective policy environment that ensures stable and secure sources of food access for its vulnerable household, while in low food deficits countries the policy focus needs to be on how to educate its population about effective means of health management both to counter the tendencies of weight gain and /or child stunting that is still prevailing in some low food deficit countries.

[46] Smith, 2003; Mallick and Rafi (2010) and Bold, Quisumbing and Gillespie (2013) discuss the channel of impact of indicators of female empowerment on outcomes of heath of the household.

From a review of both low food deficit countries in terms of their productive structures and of international evidence in terms of how countries achieved food secure outcomes globally, it can be concluded that to achieve the target of food security within high food deficit ECO countries, the debate of self-sufficiency versus crop diversification into high value agricultural produce like fruits and vegetables is irrelevant and instead the focus should be on institutional, social, economic, demographic and environmental constraints that may limit the performance of agricultural sector as well as on measures to counter such rigidities so as to yield resilient and productive outcomes with a pro-poor bent.

Chapter 5 - ECO Region Heterogeneities

5.1. Introduction

The key question to be answered within this analysis is how low and high food deficit ECO countries vary not only in terms of their geographical endowments but also how these endowments are being used in creating more productive outcomes both in sphere of agriculture and in terms of their higher macroeconomic stability within low food deficit ECO region. The important insights that we will like to take from this deeper analysis of structural heterogeneities across low and high food deficit ECO regions are twofold that is:

- Firstly, what is the proportion of countries that are agricultural dependent within these two regions, and
- Secondly, how is this varied dependence on agricultural economy contributing to the overall macroeconomic setting in these two regions

In this context we will divide discussion based on patterns in Figure 5.1, Figure 5.2 and Figure 5.3 along the following three dimensions:

1. Link of agricultural endowment with that of agricultural productivity
2. Overall profile of macroeconomic conditions and of various policy instruments
3. Identification of varied extent of agricultural dependence across low and high food deficit ECO regions.

5.2. Heterogeneities Within the ECO Region

Within the ECO region, a number of heterogeneities in the context of food security are evident, as highlighted in the following sub-sections.

5.2.1. Agriculture Endowment and Productivity Link

In terms of physical endowment for any country, size of land is not the most important factor from perspective of agriculture but more so is the quality of arable land in terms of the potential for cultivation. This suggests the availability of agricultural land (arable land and permanent-crop land) and availability of water resources (an essential element not just for agricultural growth but also for life in general) are two critical elements of concern. Analyzing the trends for these two elements along with agricultural productivity across low and high food deficit zones within the ECO region, the following patterns emerge.

In terms of endowment of arable land, we find that on average high food deficit region (mainly due to the presence of Pakistan) is much more endowed than compared to low food deficit region while in terms of endowment of permanent crop area as percent of total land is concerned the low food deficit region takes an edge primarily due to much higher share within Turkey and Azerbaijan (Appendix Tables 3.2a and 3.3a). However the crucial pattern that is evident in figure 1 in terms of agricultural productivity is that among low food deficit ECO countries, not only country such as Turkey which is among most well-endowed in agricultural land in ECO region has significantly higher agricultural productivity (both in level and its growth rate) than that in Tajikistan, Afghanistan and

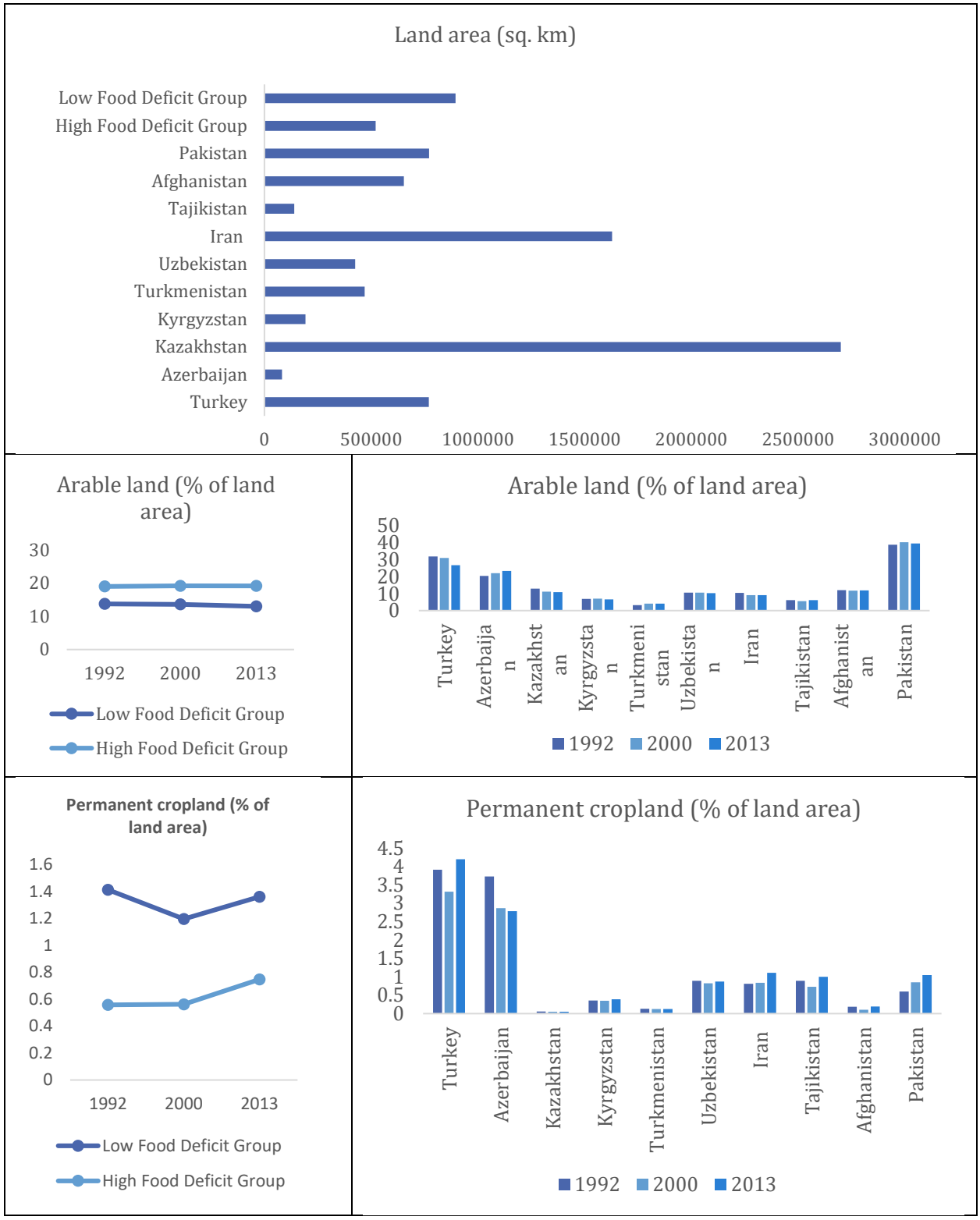
Pakistan but also all other low food deficit economies are documenting relatively better growth tendencies in how agricultural value added per worker is evolving over time irrespective of being not as gifted in agricultural capacities as Turkey or Pakistan (Appendix Table 3.4a) . This is evident from pattern in figure 1 whereby it can be seen that not only level of agricultural value added per worker is relatively greater on average in low than high food deficit ECO region but also its growth rate post 2000 (Appendix Tables 3.4a and 3.4b). At disaggregated level, we find all seven low food deficit ECO countries are showing positive and sizable growth in agricultural value added per worker, whereby among them the most notable are Turkey, Kazakhstan, Turkmenistan, Uzbekistan and Iran (ibid). In contrast in high food deficit region, even though Tajikistan shows positive signs in agricultural productivity, but Pakistan and Afghanistan show stagnant patterns post 2000 (ibid).

Further looking into patterns related to water productivity, we find that not only low food deficit region have on average much higher availability of water resources per person per year, but water productivity out of fresh water withdrawal (a large proportion of which is used for agricultural purpose both in low and high food deficit ECO regions) is also substantially more as compared to the three high food deficit countries along with much higher rate in growth in arable area equipped for irrigation post 2000 – a means to protect country agriculture from adverse climatic shocks (Appendix Tables 3.5a, 3.6a , 3.7a and 3.8b). This again reinforce as to why agricultural sector in low food deficit region is much more productive as oppose to high food deficit countries.

Finally, in terms of environmental risks, a key pattern from perspective of sustainable development and future land quality for agriculture purpose is issue of fertilizer use. From patterns in Figure 5.1, here we find that on average usage of fertilizer is relatively much higher in high food deficit region than low food deficit primarily due to higher level of usage in Pakistan and Tajikistan with increasing rate post 2000 in the former (Appendix Tables 3.9a and 3.9b). However, this issue of increasing risk in future degradation of agricultural land due to increase in intensity of fertilizer is not specific to high food deficit zone within ECO region. Even among countries which have curtailed hunger from their boundaries to a minimal level are facing this problem. For example from patterns in figure 1 we can see that within Turkey and Uzbekistan, not only there is substantial reliance on these chemicals to boost agricultural output but its use is increasing at positive rate over time whereas in Azerbaijan, Kazakhstan and Kyrgyzstan we find growth in fertilizer use, however the level of usage is much lower as compared to other countries that have high intensity in fertilizer application per hectare of arable land such as Uzbekistan, Turkey, Tajikistan and Pakistan (ibid). The only ECO country that has extremely less influence of this phenomenon is Afghanistan or that is showing signs of massive reduction post 2000 irrespective of history of its significant use is Iran (ibid).

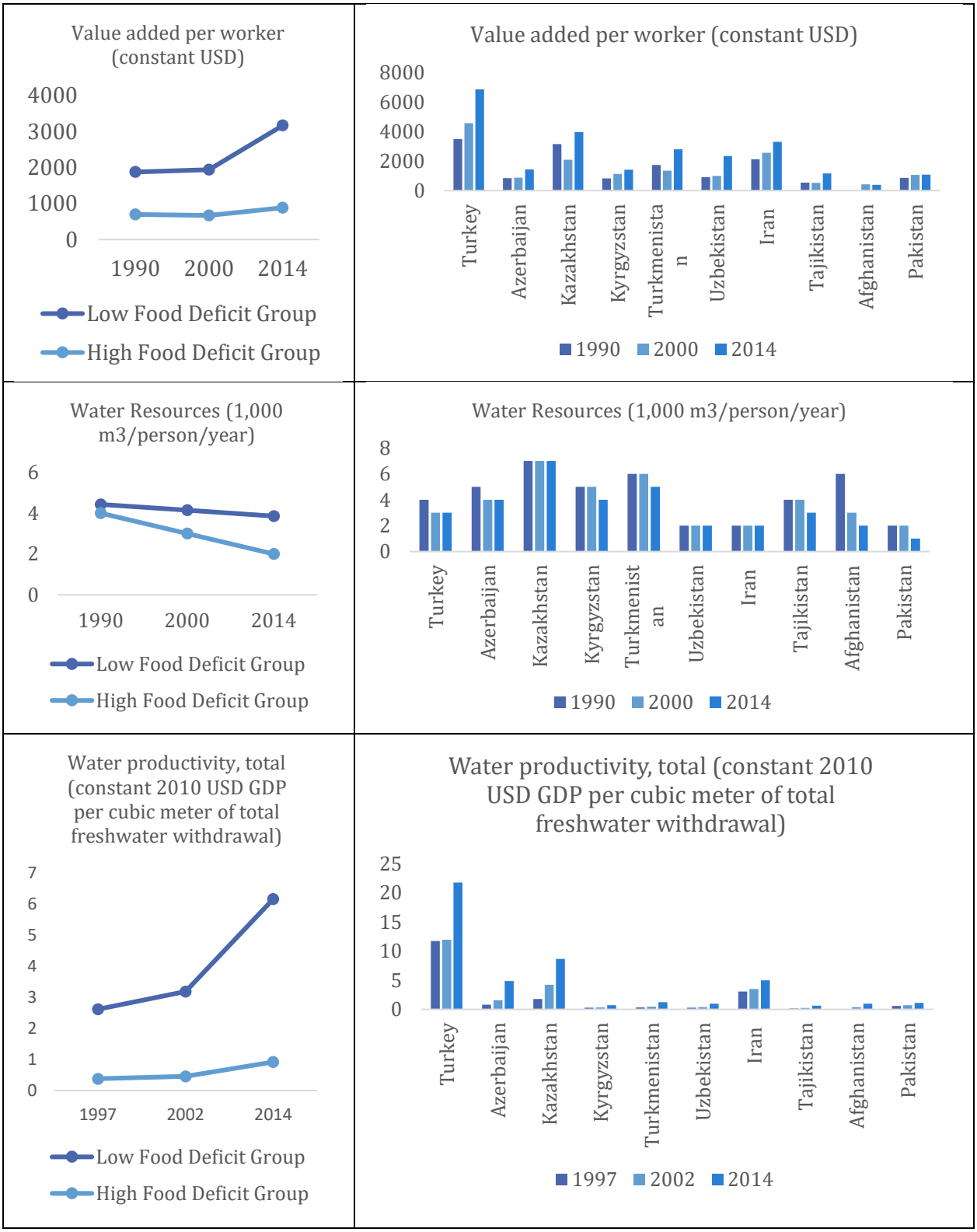
Hence from patterns in Figure 5.1, whereby an attempt has been made to relate structure of geographical content to level of productivity in agricultural sector within low and high food deficit regions, it can be safely concluded that low food deficit ECO region is on average much better placed in terms of how its agricultural sector is performing than the high food deficit economies (especially in comparison to Pakistan and Afghanistan).

Figure 5.1: Agricultural Productivity, Arable Land, Permanent Cropland Endowment



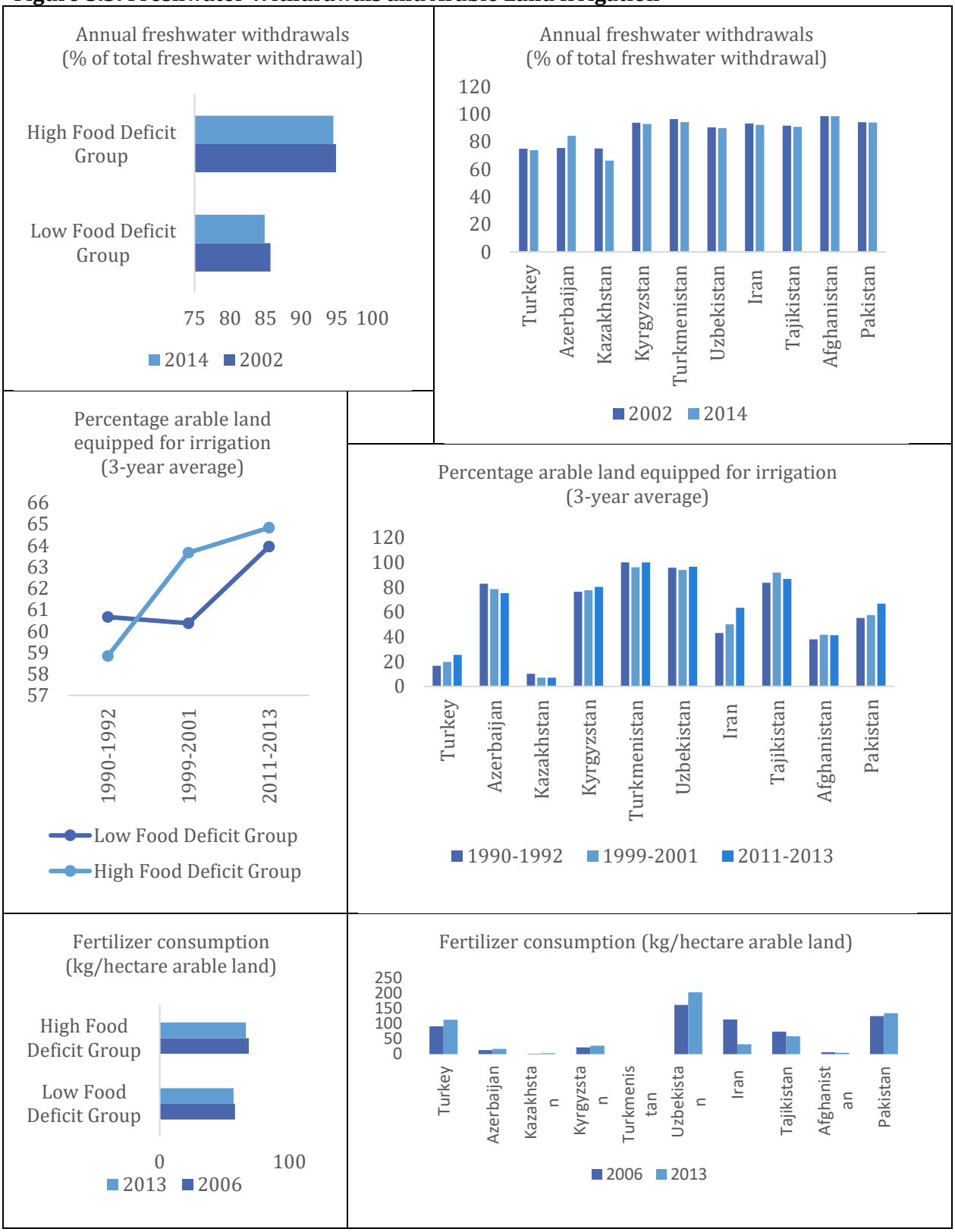
Source: FAOSTAT (2017); World Bank (2017)

Figure 5.2: Comparison of Agricultural Land Endowment and Productivity



Source: FAOSTAT (2017); World Bank (2017)

Figure 5.3: Freshwater Withdrawals and Arable Land Irrigation



Source: FAOSTAT (2017); World Bank (2017)

This finding is in line with strong empirical support from international research that agricultural growth has not only found to be pro-poor in the sense of reducing poverty and raising income of lower quintile, but in comparison to other sectors has been more effective in poverty eradication (Chenery *et al.*, 1979; Lipton and Ravallion, 1995; Eastwood and Lipton, 2000; Christiaensen, Demery and Kuhl, 2011). This evidence is also present in the case of developing countries where the locus of poverty is primarily in the rural area (Lipton, 1977; Chenery *et al.*, 1979). This report has provided evidence that food security within ECO region has emerged as more of an issue of food access than availability. Hence higher agricultural productivity within the low food deficit countries as compared to the high food deficit countries suggests agricultural growth is pro-poor for these countries as well.

Furthermore, another important pattern that is evident from analysis above is that performance of agricultural sector is not undermined in low food deficit countries even among those that have relatively disadvantageous agricultural endowments show that this element of unfavorable geographical heritage for cultivation does not become barrier to their agricultural growth, whereas on contrary to this empirical evidence in case of Pakistan (one of high food deficit country within ECO region) we find that in spite of its land being quite well endowed for agriculture it is unable to generate vibrate opportunities for growth in this sector especially post 2000. So, the question is why this is so? To answer this question, it is important to place this finding in context of their macroeconomic and institutional capabilities to provide a comparison of productivity levels in other spheres of economies across low and high food deficit zones.

Agricultural growth is no doubt an important element in ensuring food security of the population and keeping poverty and hunger levels in check; however, it is not the only factor. To understand the totality of the process through which agriculture sector can act as a game changer for eliminating poverty and limited access of poor to safe and nutritious food, other structural elements such as indicators related to fiscal, monetary and trade policies and socioeconomic development also need to be checked within each ECO country, along with how far the country has progressed in shifting away from an agrarian society towards an economy with a strong industrial base.

Trade focused CGE models presented in Robinson, El-Said and San (1998); Harris and Lee (2001); Lofgren *et al.* (2001) and Lofgren, El-Said and Robinson (2002)are examples of how sound economic policy can interact with agricultural growth to create an atmosphere conducive to poverty and hunger eradication efforts. These models also demonstrate the consequence of trade policy on agricultural outcomes. The nexus between public expenditures and agricultural growth is largely dependent on the effective domestic management of fiscal policy and the allocation of funds to achieve various developmental objectives (World Bank, 2017). Monetary policy also has an impact on agricultural growth through the channel of interest rate and general macroeconomic environment. CGE models have been used at a practical level in development planning to incorporate the inter-linkages between different macroeconomic policies on agricultural growth and development (Johansen, 1960; Sandee, 1960; Hertel, 1997; Wobst, 2001; Jensen, Robinson and Tarp, 2002; Jensen and Tarp, 2005; Dixon, 2006).

5.2.2. Macroeconomic Conditions and Policy Environment

Coupled with an evaluation of general macroeconomic conditions across low and high food deficit zones within ECO region[47], it is evident that low food deficit countries on average have much better performance in terms of indicators related to fiscal, trade, monetary and financial policies and with less involvement of foreign countries in their economic policy making. In this context following key patterns emerge from figure 2a and 2b.

In the context of fiscal policy, it is observed that on average the low-food deficit region has much more fiscal space than high food deficit region. This is evident from lower tax to GDP ratio with larger dependence on revenue from international trade in high food deficit ECO zones as compared to low food deficit zones as well as lower size of government spending (figure 2a and figure 2b). In terms of tax revenue (as percent of GDP), Turkey has the highest proportion (in 2015) at 21.1 percent, followed by Kyrgyzstan (18.1 percent), Azerbaijan (12.9 percent), Pakistan (11.1 percent), Kazakhstan (10.2 percent), Tajikistan (7.7 percent), Iran (7.6 percent) and Afghanistan (7.4 percent).[48]

In the context of monetary and financial policy performance, the important finding at aggregate level that comes out from patterns in figure below is that there was much

[47] For detailed analysis of how macroeconomic structural constraints and the enabling policy environment have evolved over time within ECO region, see PIDE-ECO 2017.

[48] Information of Tax to GDP ratio is unavailable for Turkmenistan and Uzbekistan (Appendix 3.10a)

higher financial penetration in high food deficit zone but overtime this pattern has reversed in favor of low food deficit zone as is evident from how broad money supply as percentage of GDP has evolved from 1990 to 2015. However, if we compare with other developed and developing countries overall financial penetration is quite low in ECO region with countries that have value for ratio of broad money supply to GDP towards the higher side include Turkey (61.3 percent), followed by Pakistan (53.4 percent) and Iran (52.1 percent) and the one with lowest value is Afghanistan (35.1 percent) as per 2015 estimates (Appendix 13.a).

Furthermore, not only is broad money as percentage of GDP is the lowest in Afghanistan in the ECO region but so is private credit to GDP ratio (percent)[49] 4 percent in contrast with 80 percent for Turkey, 38.5 percent for Azerbaijan, 37.7 percent for Kazakhstan, 22.5 percent for Kyrgyzstan, 22.2 percent for Tajikistan and 15.4 percent for Pakistan in year 2015. Hence the weakest country in context of financial intermediation in ECO region is Afghanistan which at some level can be attributed to the failure of Kabul Bank in 2010. However, in terms of inflation stability we find that overall inflation in each ECO country except for Iran has remained in single digit as per 2015 values (Appendix 3.14a). These patterns match key findings from PIDE ECO (2018) and validate the trend of inflation remaining in single digits since 2012 in all ECO countries except Iran. However, inflationary pressures within the Iranian economy continued to fall under a less accommodative monetary policy stance (contractionary monetary policy), with the

[49] Primary data sources are ADB (2017); IMF (2017); World Bank (2017).

consumer price index falling to 13.7 percent in 2015, from a peak of 39.3 percent in 2013 (PIDE-ECO 2018).

In the context of trade policy too we find that there is intercrossing in the average lines of trade as percent of GDP for both low and high deficit zone, whereby in 2000 both regions have on average same level, however comparison at 1990 and 2015 benchmarks show that low food deficit zone is much more open to trade than high food deficit ECO region. Evidence of a liberal trade policy can be assessed through the shares of export and import in world for each country.

Export and Import shares in the world as of 2015 estimates for Turkey amount to 46.2 percent and 54.5 percent respectively; for Iran 21.31 percent and 12.8 percent respectively; for Kazakhstan 9.36 percent and 10.01 percent respectively; for Azerbaijan 6.2 percent and 4.09 percent respectively; for Turkmenistan 7.58 percent and 5.01 percent respectively; for Uzbekistan 1.89 percent and 2.08 percent respectively; for Kyrgyzstan 0.34 percent and 0.79 percent respectively; for Pakistan 5.63 percent and 7.29 percent respectively ; for Tajikistan 0.66 percent and 1.09 percent respectively; and for Afghanistan 0.87 percent and 2.35 percent respectively (PIDE-ECO, 2017).

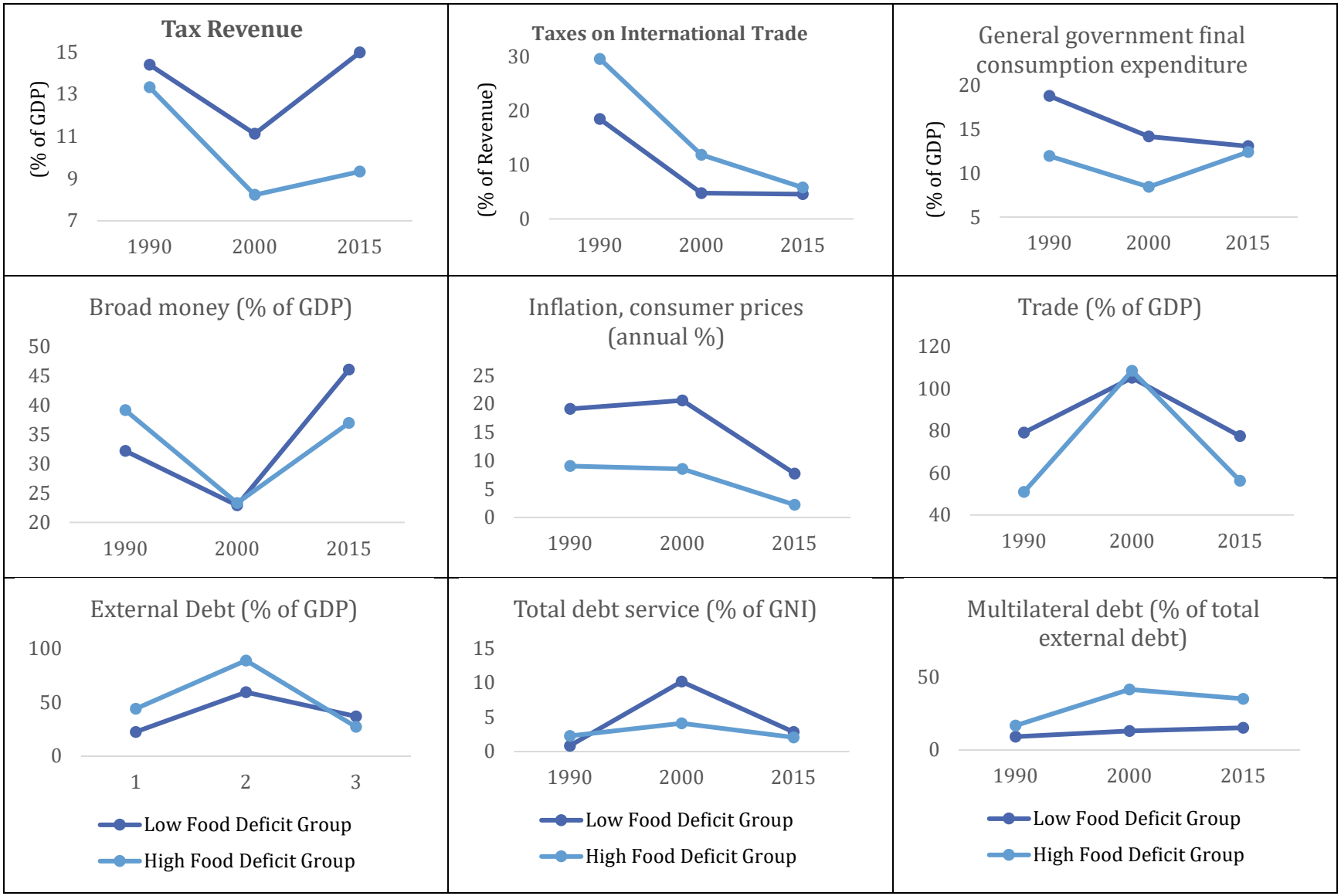
It is evident that overall the low food deficit region has relatively more open trade regimes than high food deficit. Among low food deficit zone countries which have notable share in world in terms of export and imports are Turkey, Iran and Kazakhstan while in high food deficit the country with highest contribution is Pakistan, however its

contribution is much less as compared to that of well performing low food deficit countries[50].

In the context of external dependence, at one level the high food deficit countries appear to be more dependent on foreign aid and have a much higher probable involvement of external donors in their policy making than low deficit countries (Figure 2a and 2b; Appendix Tables 3.18a and 3.18b). However, in terms of external debt servicing as percent of GDP, not only is a much larger share of GDP utilized for paying off debt in low food deficit countries, but the extent of external debt from multilateral sources is greater in the latter group. This indicates that the structure of external debt is more stable in high food deficit countries (Figure 2a and 2b; Appendix Tables 3.16a, 3.16b, 3.17a and 3.17b).

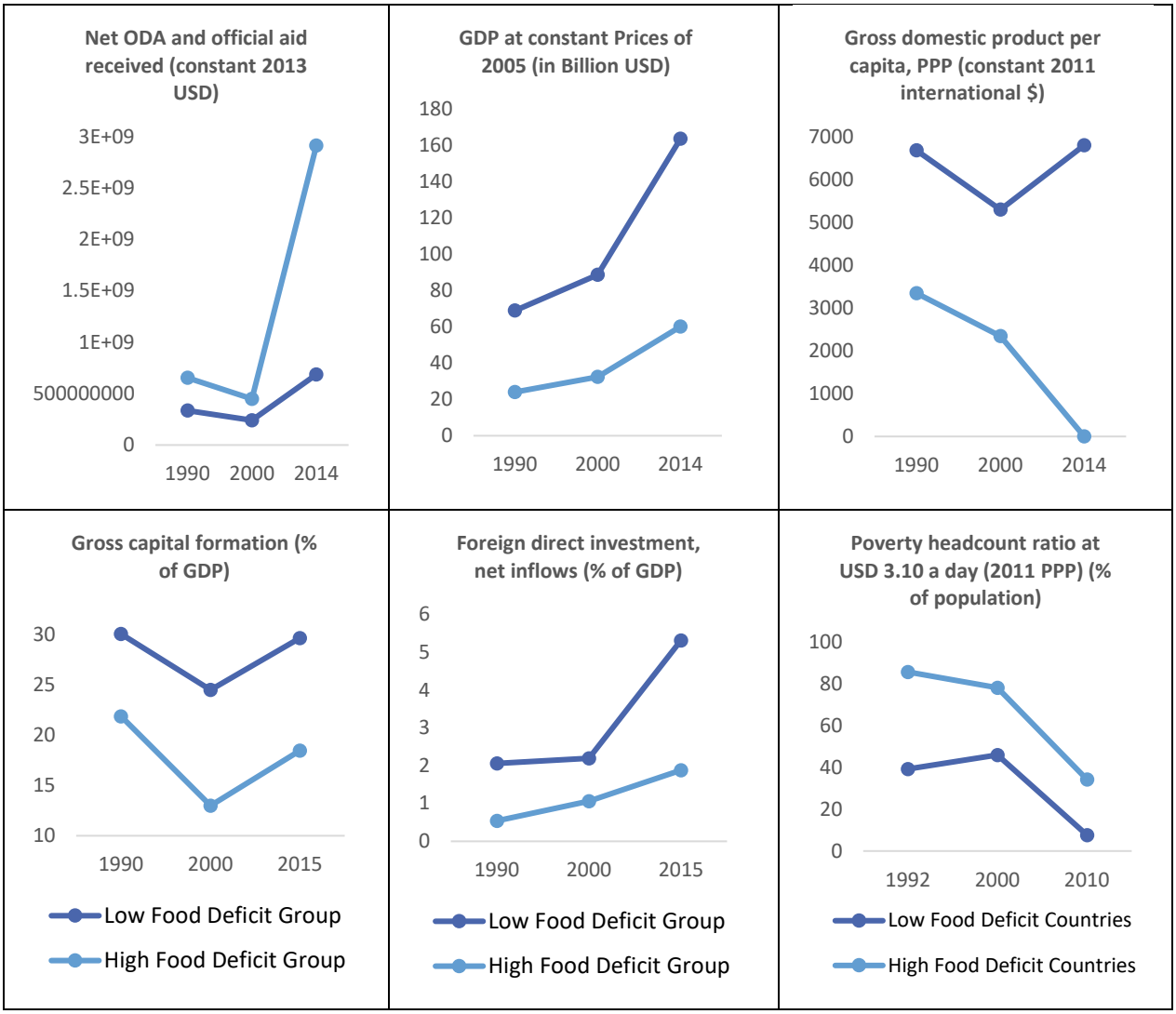
Furthermore, in the context of external debt to GDP ratio, this ratio is higher in low deficit countries; particularly in Turkey and the Central Asian countries in 2000. Not only is the low food deficit curve showing a declining trend in subsequent years, but the rate of decline in debt is much more as compared to high food deficit countries. The economic turmoil within Central Asian countries in the post-independence period followed by proper economic management in subsequent years could be responsible for this fact. This is also evident in the trends of FDI ratios, capital formation, GDP per capita and GDP levels (Figure 2b; Appendix Tables 3.20 a to 3.24b). However high food deficit countries such as Afghanistan and Pakistan are more vulnerable as not only they have much higher dependence on aid, but they also have weak macroeconomic indicators of FDI, capital formation, and GDP per capita, coupled with much higher levels of poverty (Figure 2b; Appendix Tables 3.20 a to 3.24b).

Figure 5.4: Profile of Macroeconomic Conditions and Policy Environment



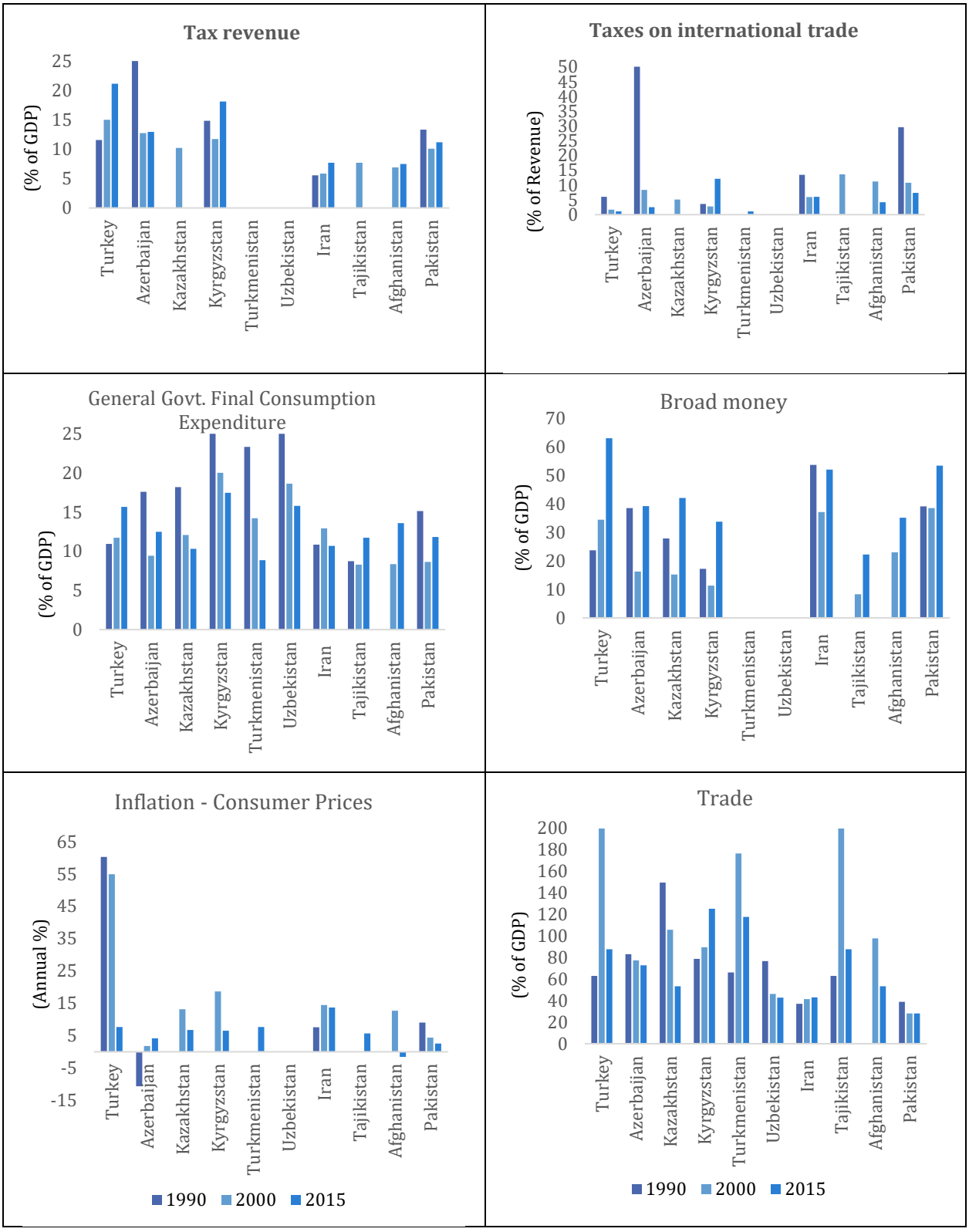
Source: World Bank (2017); PIDE ECO (2018)

Figure 5.5: Profile of Macroeconomic Conditions and Policy Environment (Contd.)



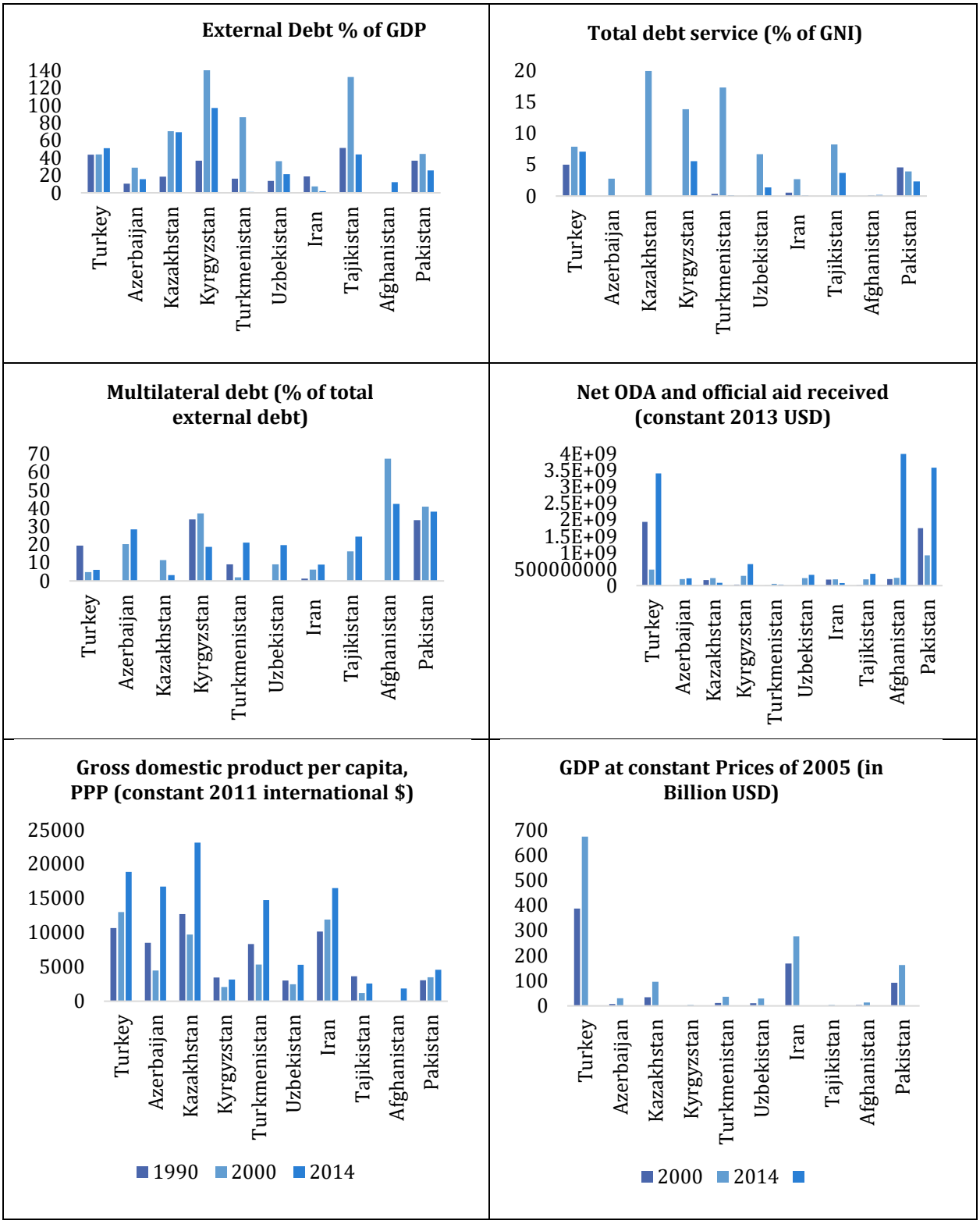
Source: World Bank (2017)

Figure 5.6: Regional Macroeconomic Profile and Policy Environment



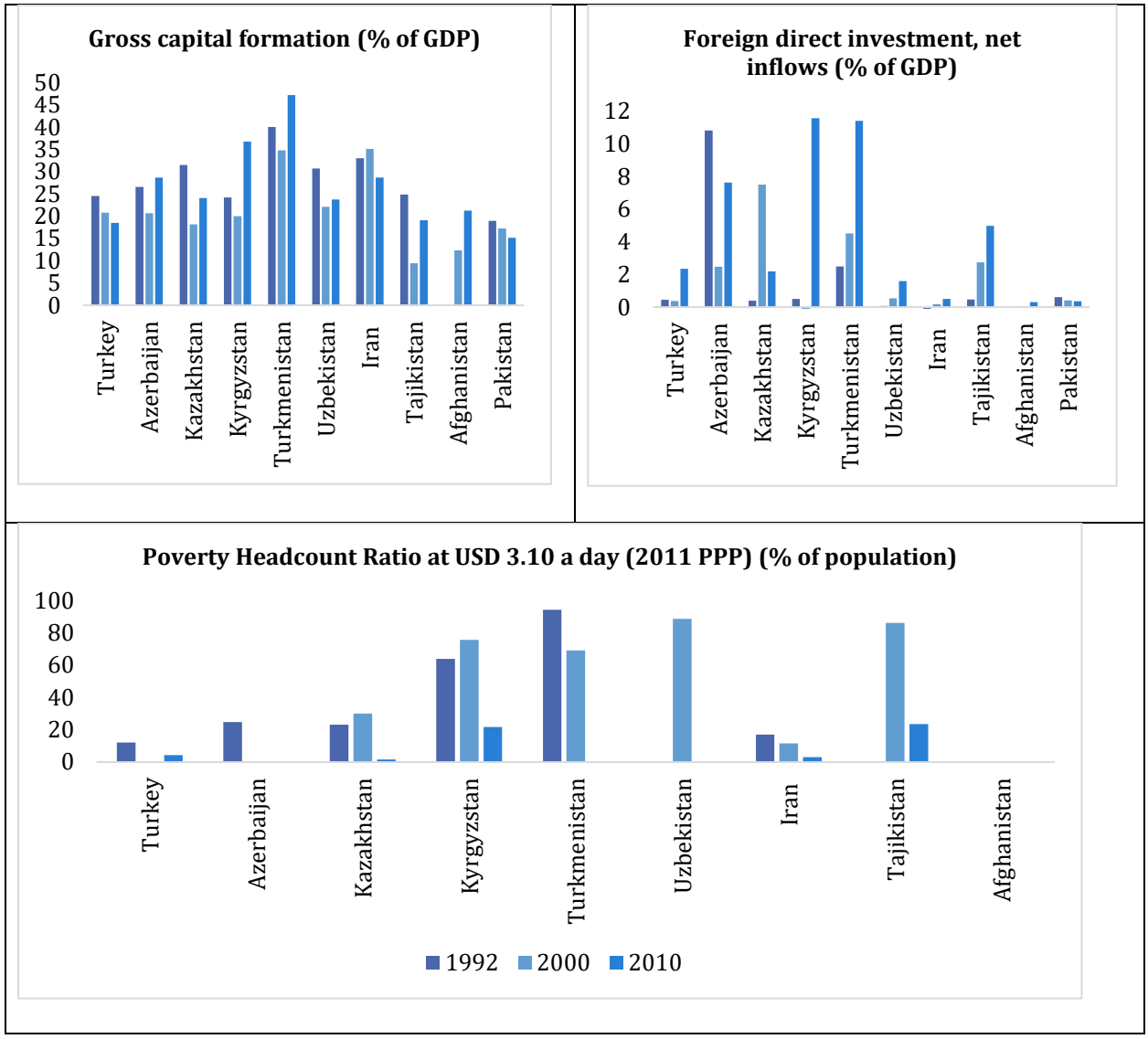
Source: World Bank (2017)

Figure 5.7: Regional Macroeconomic Profile and Policy Environment (Contd.)



Source: World Bank (2017), PIDE ECO (2018)

Figure 5.8: Regional Macroeconomic Profile and Policy Environment (Contd.)



Source: World Bank (2017)

In conclusion, the overall low food deficit countries depict a picture of not only macroeconomic stability but a more consistent economic policy environment as compared to high food deficit countries.

5.2.3. Varied Extent of Agricultural Dependence

High food deficit ECO countries have substantially more agricultural dependent societies than low food deficit countries. This can be inferred by not only the much greater share of agriculture in GDP, and correspondingly lower share of industrial output in GDP within these countries, and the greater concentration of population in rural areas, but the larger proportion of population dependent on agriculture sector for employment in these countries (Appendix Tables 25 to 30).

Furthermore, the poverty and population growth dynamics suggest that not only is the overall population size far greater in high food deficit regions, but the growth rates are also substantially more for both rural and urban populations (Appendix Tables 31 and 32). While average poverty is much higher in high food deficit group than the low food deficit group[50] with substantially high poverty levels in both rural and urban populations (2014 estimates) in these three high food deficit countries[51], poverty is centered in rural population in a much higher proportion in these two high deficit countries (figure 3a and 3b; Appendix Tables 33 and 34).

[50]Data availability on poverty level is very limited for ECO region. As per available information for poverty in 2014 low food deficit countries are on average in much better position than high food deficit countries. However such aggregation is based on account of only three low food deficit ECO countries Turkey, Kazakhstan and Kyrgyzstan where first two countries show low percentages of urban and rural poor (0.6 percent urban poor and 5.1 percent rural poor in Turkey; 1.3 percent urban poor and 4.7 percent rural poor in Kazakhstan) while poverty remains a significant problem in Kyrgyzstan with documented 26.9 percent and 32.6 percent poor in urban and rural areas respectively as per 2014 estimates.

[51] Among the three high food deficit countries Afghanistan is showing highest poverty levels both in context of rural and urban population. This in face of economic and political turmoil in Afghanistan since last many decades is quite understandable outcome.

This does not undermine the agrarian economies, rather shows that the high food deficit zone within ECO region is, on average, at lower level of overall development than the remaining seven countries that have removed hunger successfully from their countries. Analysis of trends in figure 3a and 3b we hint to some structural pathways that put the rest of seven countries on a relatively much higher developmental plane.

Not only have low-food deficit countries protected themselves from population pressures by keeping their population growth rates at a substantially lower level (Figure 3a and 3b), but their agricultural output has a relatively smaller share in GDP than the industrial sector, while value added is higher in both level and growth terms (Figure 1). This suggests that the agriculture sector and rural development are important piece of the puzzle to ensuring an economy is in a hunger free domain.

Furthermore, not only have low food deficit ECO countries on average performed better in terms of eradicating hunger from their countries as compared to the three hunger prone countries; i.e. Afghanistan, Pakistan, and Tajikistan, but also in terms of the overall performance of both the agricultural sector at large as well as indicators related to overall macroeconomic structure of the economy. These factors combined suggest that not only were the policies followed within these countries centered on hunger elimination through pro-poor strategies, but that such a goal was achieved with well-rounded and comprehensive structural programs. These programs improved their overall internal economic stability and created positive avenues of agricultural growth and positive feedback effects across agriculture and other sectors of the economy. Hence agricultural

Figure 5.9: Agricultural Dependence, Regional Poverty and Demographic Dynamics

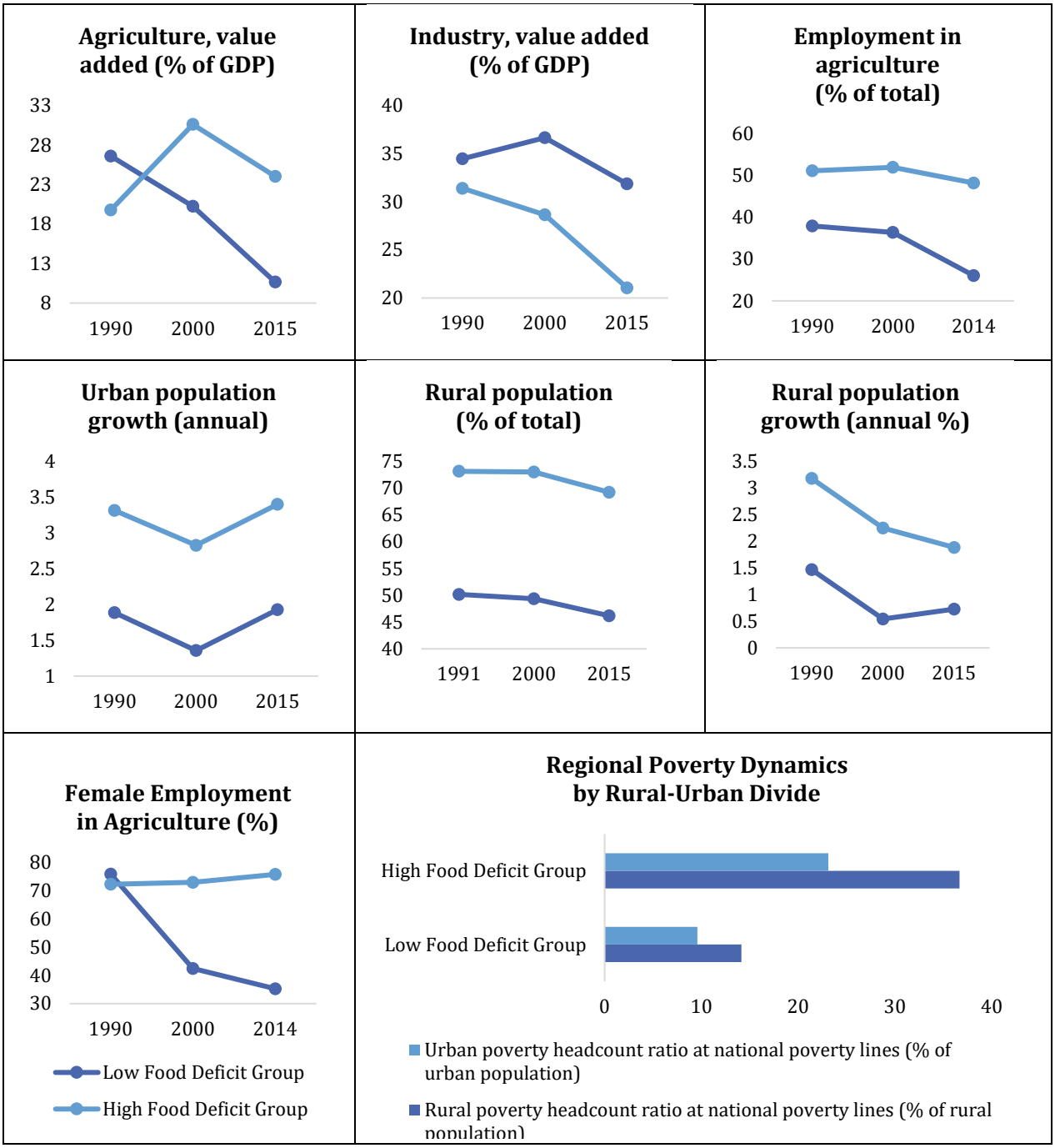


Figure 5.10: Agricultural Dependence, Regional Poverty and Demographic Dynamics

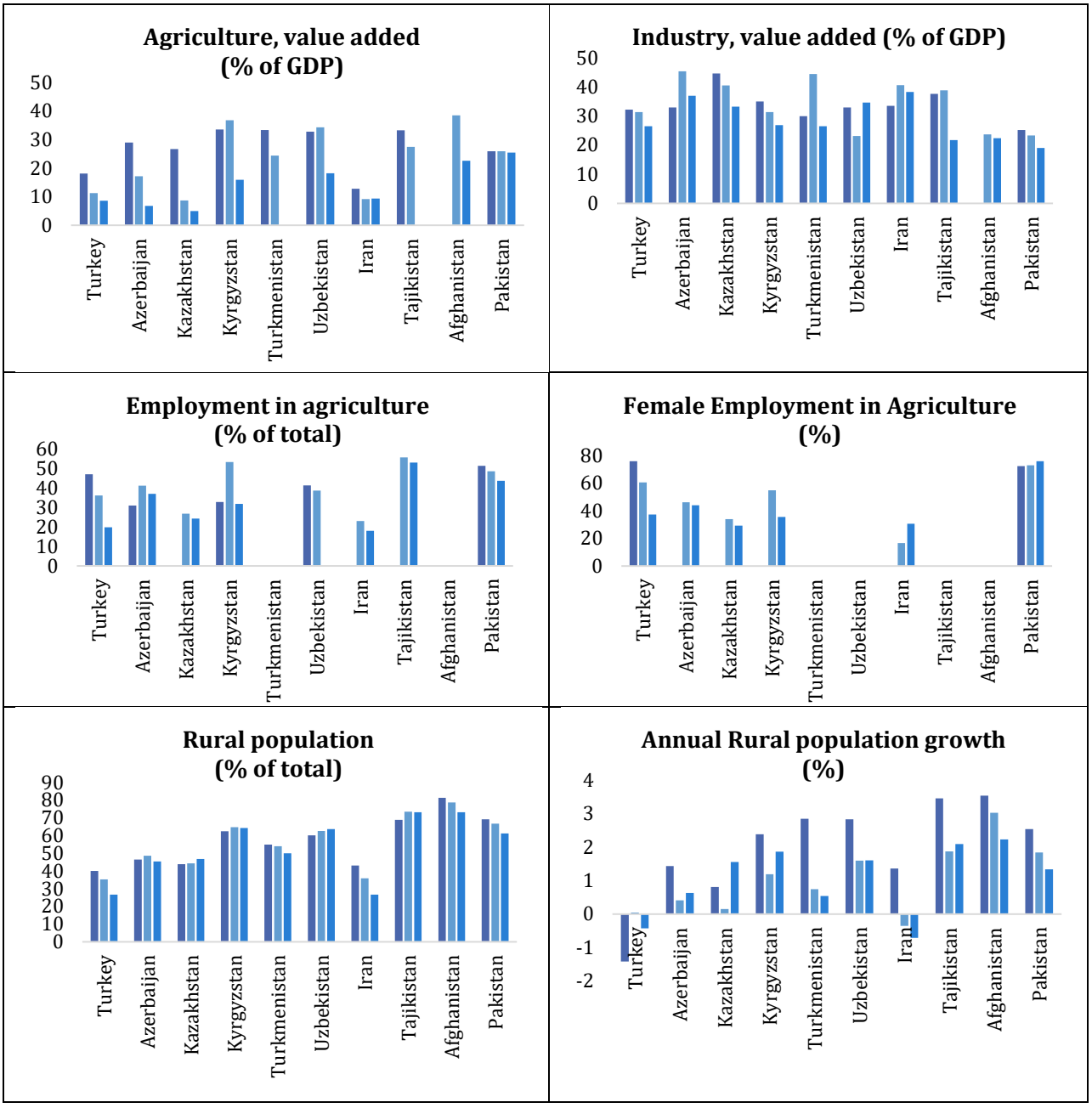
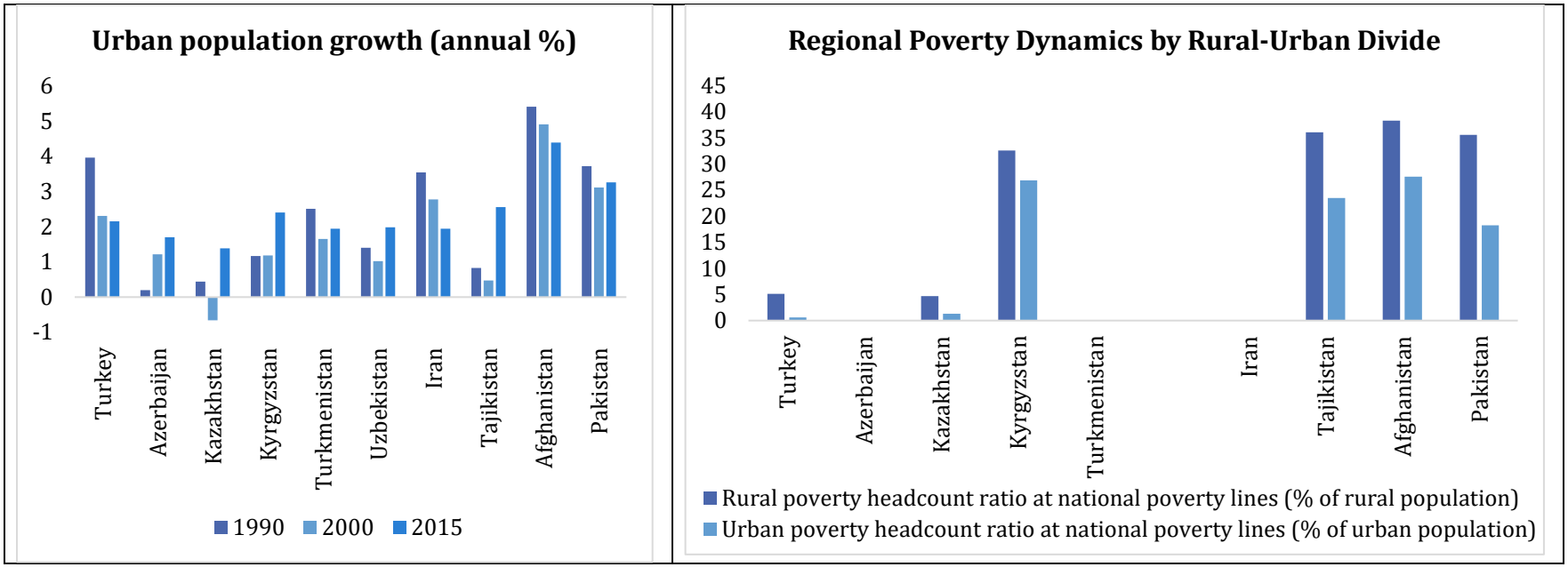


Figure 5.11: Agricultural Dependence, Regional Poverty and Demographic Dynamics



and rural development is an important point of focus in fight against undernourishment but in this process link across agricultural productivity to overall economic environment and back should not be ignored.

5.3. Agriculture Production and Trading Patterns

Based on the preceding discussion and analysis, a conclusive viewpoint is presented here regarding what the response within each ECO country and across the two food groups (low food deficit and high food deficit) within ECO region should be in the following two policy dimensions:

(i) Where does a country stand in terms of its position in the policy debate on self-sufficiency in staple food supply versus diversification into high-value non-staple agricultural produce?

(ii) How capable is the ECO region in reaping benefits out of increased demand (both local and global) for animal protein?

These important policy questions can be answered by first identifying the food categories in which a country or a region (low or high food deficit group) has a production advantage, and then tracing production and trade patterns in food items. Finally, the policy practice in terms of diversification into high value non-staple agricultural produce or stress on self-sufficiency on staple food groups will be identified along with assessment of the potential of each country in production and trade of animal protein products.

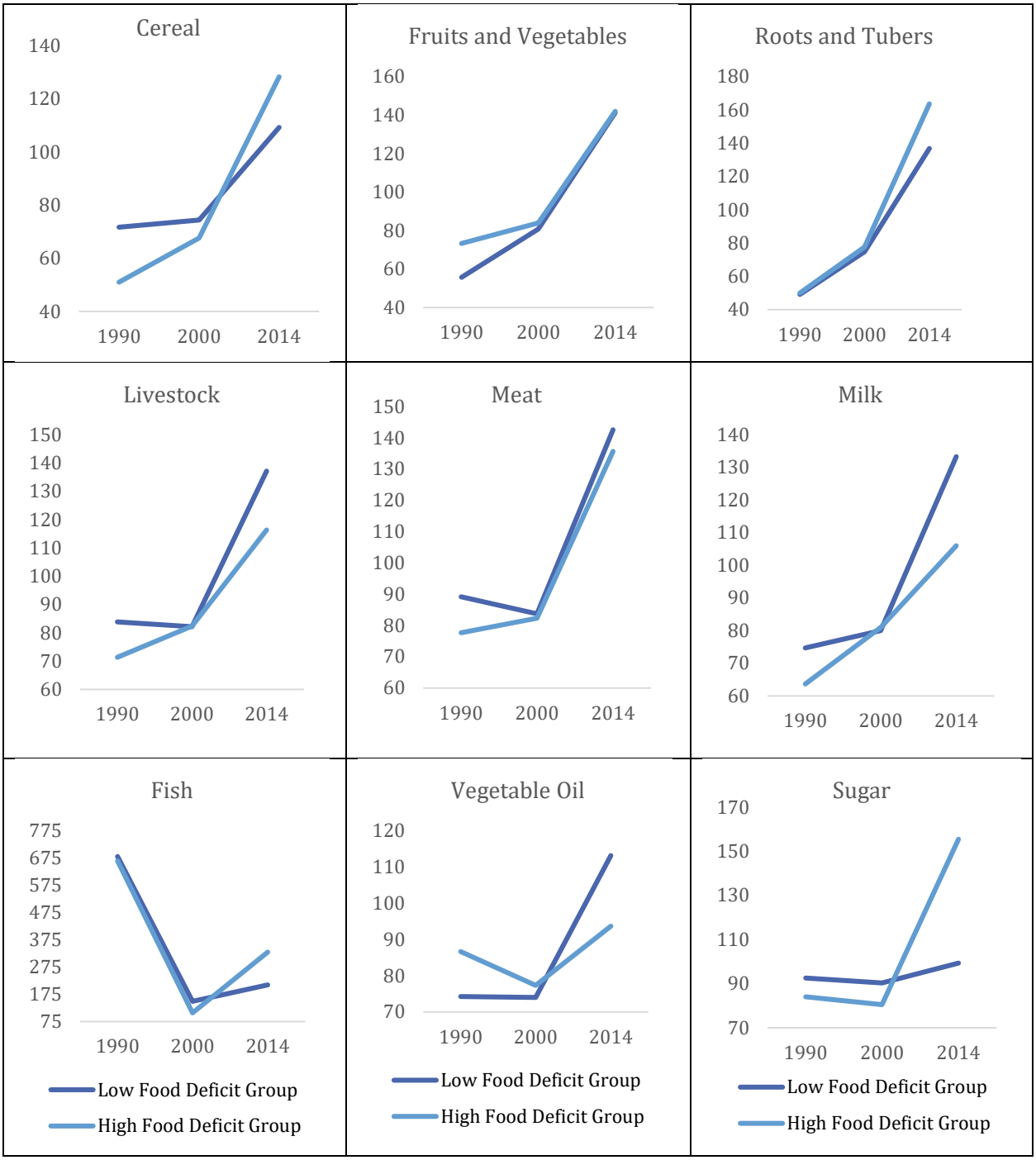
5.3.1. Production Patterns by Product Type

There is evidence of growth in all food categories in both low and high food deficit groups in the post 2000 period. On average we can see that countries in the high food deficit group have an edge over those in the low food deficit group in the production of cereal, roots and tubers, fish and sugar. Both groups also show comparable growth patterns in fruits and vegetable category and a clear comparative advantage of low food deficit group in the production of livestock, milk and vegetable oil products. They also have a slight advantage in meat as compared to the countries in the high food deficit groups. However, these patterns are aggregations and may overshadow country specific variations.

Disaggregated analysis of level and growth patterns of cereal production country-wise shows that all three high food deficit countries are contributing substantial amount in terms of level of production. Tajikistan and Afghanistan, with growth rates of 104.5 percent and 230.5 percent respectively for the period 2000-14 were the main contributors to sharp growth in the ECO region. (Appendix Tables 3.35a and 3.35b).

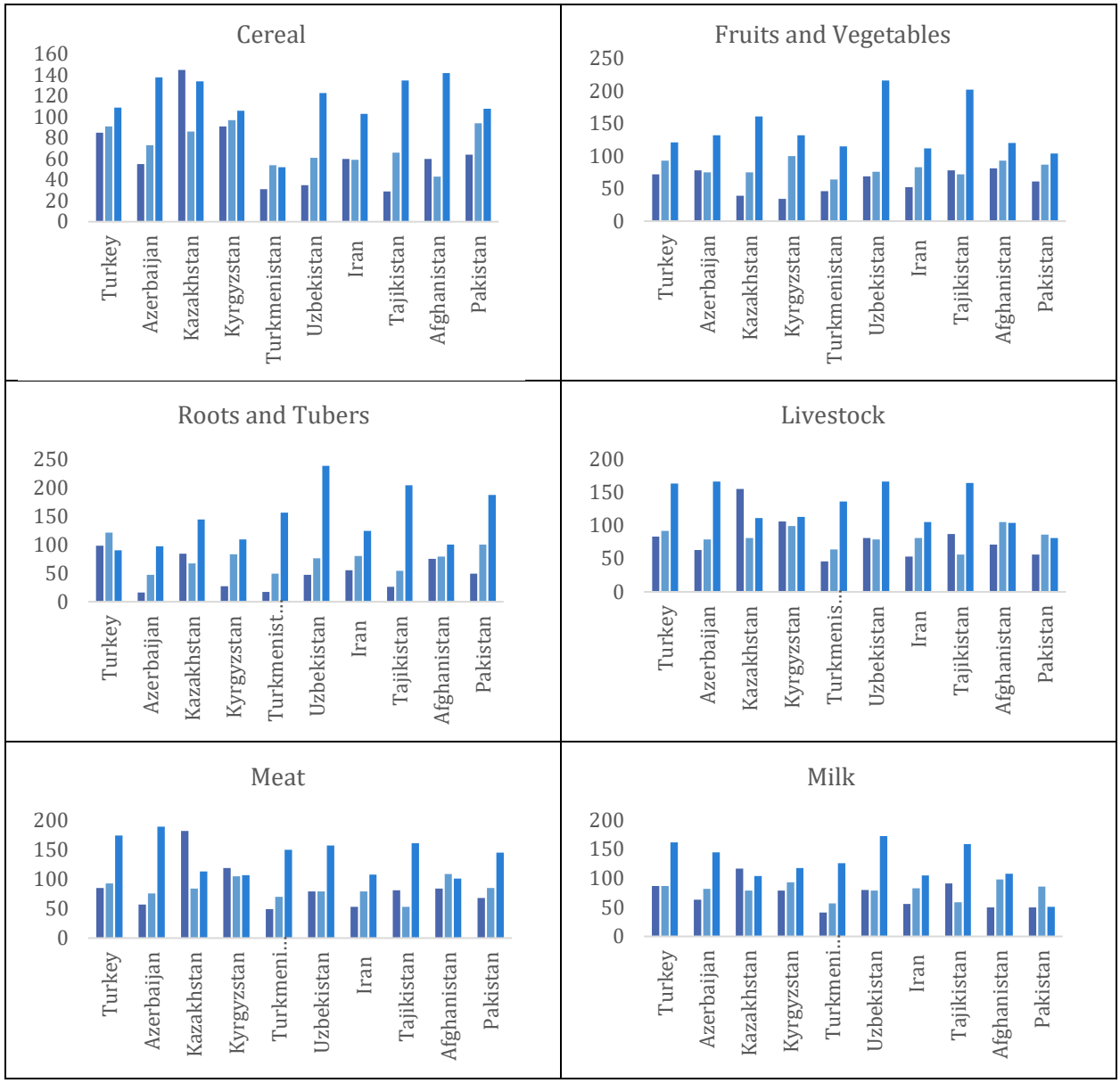
Within the low food deficit countries, contrary to aggregate behavior, all countries except Turkmenistan have an extensive base of cereal production. Estimates for cereal production in 2014 for Azerbaijan, Kazakhstan and Uzbekistan are close to production levels estimated for Tajikistan and Afghanistan while estimates for Turkey, Kyrgyzstan, and Iran are near those for Pakistan (Appendix Table 3.35a). This suggests that aggregation has down-played this clear strong tendency for cereal production in the six low food deficit

Figure 5.12: Production Indices of Food Groups Across Food Deficit Regions



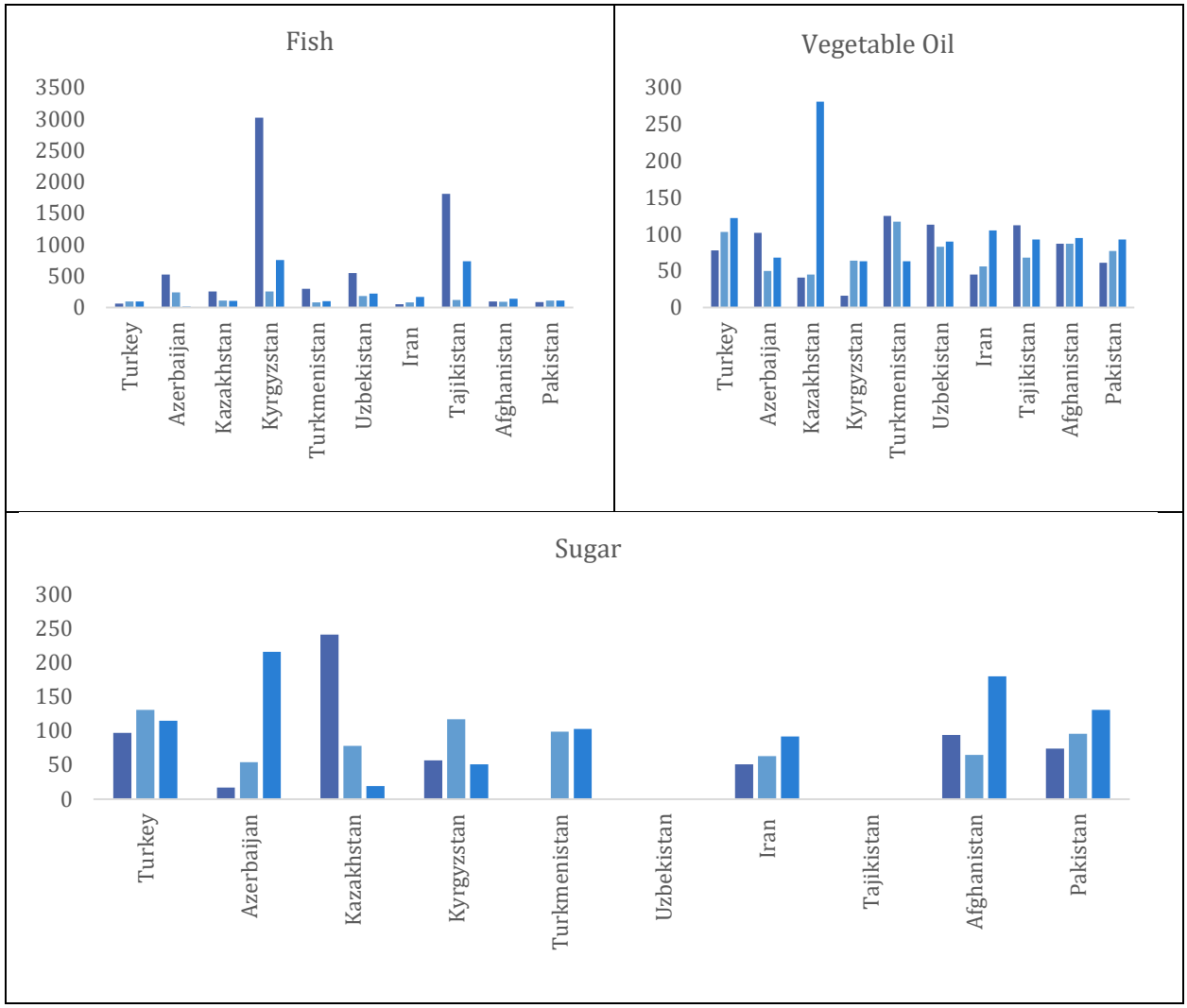
Note: Dark Blue and Light Blue lines indicate average for low and high food deficit regions respectively;
Figure are based on production indices with base year 2004-06
Source: FAO (2015); FAO (2017)

Figure 5.13: Country-wise Food Group Production Indices



Note: Blue, Red and Grey boxes represent estimates for the years 1990, 2000 and 2014 respectively; Figure are based on production indices with base year 2004-06
Source: FAO (2015); FAO (2017)

Figure 5.14: Country-wise Food Group Production Indices



Note: Blue, Red and Grey boxes represent estimates for the years 1990, 2000 and 2014 respectively;
Figure are based on production indices with base year 2004-06
Source: FAO (2015); FAO (2017)

countries due to low output in Turkmenistan. Overall, the entire ECO region has devoted substantial resources to the production of cereal crops and are showing positive trends in growth in the years after 2000.

In terms of output in the fruits and vegetable category, there is a positive trend in all ECO countries between the period 2000 to 2014 (Appendix Table 3.36b). Uzbekistan and

Tajikistan have clear advantage over other countries, while Kazakhstan has a slight advantage over the other countries for the same time period. The remaining countries have a production index value for fruits and vegetables in the range of 104 to 121 where Pakistan has the lowest index (104), and Turkey the highest (121) (ibid).

In the case of roots and tubers, the relatively higher growth plane for the high food deficit group is primarily on account of the substantial boost in production (both in in terms of level of production and its growth) in Tajikistan and Pakistan (Appendix Tables 3.37a and 3.37b). However, though the low food deficit group has slightly lower magnitude on average[52], countries in this group largely exhibited growth in production of this food; with the notable exception of Turkey. In addition, production levels in Iran, Kazakhstan and Turkmenistan are close to the regional average. Moreover, this group includes Uzbekistan, which has highest level of production in 2014 of roots and tubers[53].

In the case of livestock production, all countries in the low food deficit group have an advantage, with all seven countries registering growth trends since 2000. However, the countries with the most promising growth include Azerbaijan, Uzbekistan, Turkmenistan and Turkey (Appendix Tables 3.38a and 3.38b). Among countries in the high food deficit area, quantum and growth of production in Tajikistan has increased with growth for the

[52] Low food deficit zone as per 2014 estimates is performing less than high food deficit zone in production of roots and tubers with average value of 136.8 for low and 163.6 for high food deficit zone (Appendix Table 3.37a).

[53] 2014 values of production of roots and tubers for Uzbekistan come out to be 238 against a regional average of 144.9 (Appendix Table 3.37a).

period 2000 to 2014. On the other hand, while Afghanistan and Pakistan had growth within the period 1990 to 2000, a declining trend can be observed subsequently. This is alarming not only in the sense that these countries stand to lose their positive base in this area of production, but also in meeting rising local demand for meat-based products with a shrinking local livestock base. However, once these production levels are considered in conjunction with patterns in meat production, a decreasing trend is evident in Afghanistan after2000, while there is substantial growth in Pakistan. Thus, Pakistan is likely to remain unaffected in context of meat production (Appendix Tables 3.39a and 3.39b). Furthermore, beside Afghanistan and Kyrgyzstan, all other countries exhibit growth patterns in meat production since 2000 with prominent countries in this area of production being Azerbaijan, Tajikistan, Turkey, Turkmenistan, and Uzbekistan. Hence, the region is responding to changing patterns in demand for animal protein, however the degree of self-sufficiency in this context in a country or the region will depend on the extent of their local demand and production patterns.

In the case of milk production, growth is positive in all countries except Pakistan, where a declining trend is evident (Appendix Table 3.40b). The countries that take the lead over others in terms of fish production are Kyrgyzstan and Tajikistan, in terms of vegetable oil production it is Kazakhstan and in terms of sugar production Azerbaijan, Afghanistan, Iran and Pakistan are leading (Appendix Tables 3.41a to 3.43b).

In conclusion, looking at production patterns both at aggregate and disaggregated level within the region the key patterns that emerge are that all countries (with the

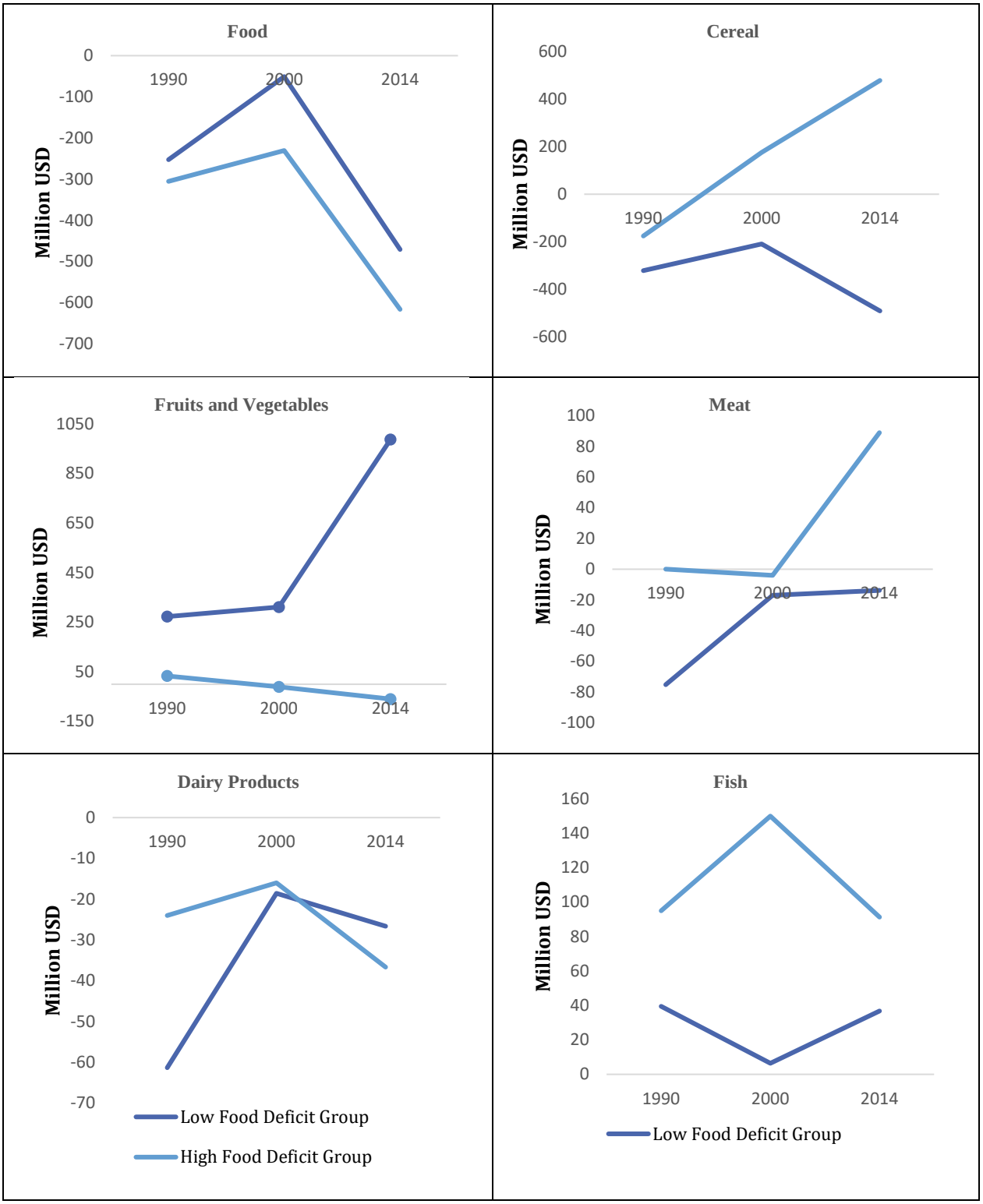
exception of a few anomalies) are investing in their food base to secure adequate domestic food supply. This is true especially in terms of staple food but also for non-staple food items such as vegetables and fruits, roots and tubers, meat, livestock and milk products. This is evident not only in growth patterns since 2000 in all these food items, and in the upward trend in these food groups within the period 2000 to 14 for most countries. However, an important question that needs further attention is: what the degree of self-sufficiency in the context of important food groups in face of changing demand preferences for food is, both internationally and domestically.

5.3.2. Self-sufficiency and Diversification Policy

To assess which food deficit group is following a food independence policy and which is not, the extent of self-sufficiency in staple food production as well as any policy of diversification (towards high-value crops and food items) can be analyzed. The low food deficit group is observed on average to follow a policy of food diversification by relying on global markets for fulfilling cereal requirements and developing their capabilities as suppliers of fruits and vegetables. The reverse patterns are observed in the case of the high food deficit group, with constant decreasing trends in net trade for fruits and vegetable food group and positive for cereal (Appendix Tables 3.44a and 3.45a).

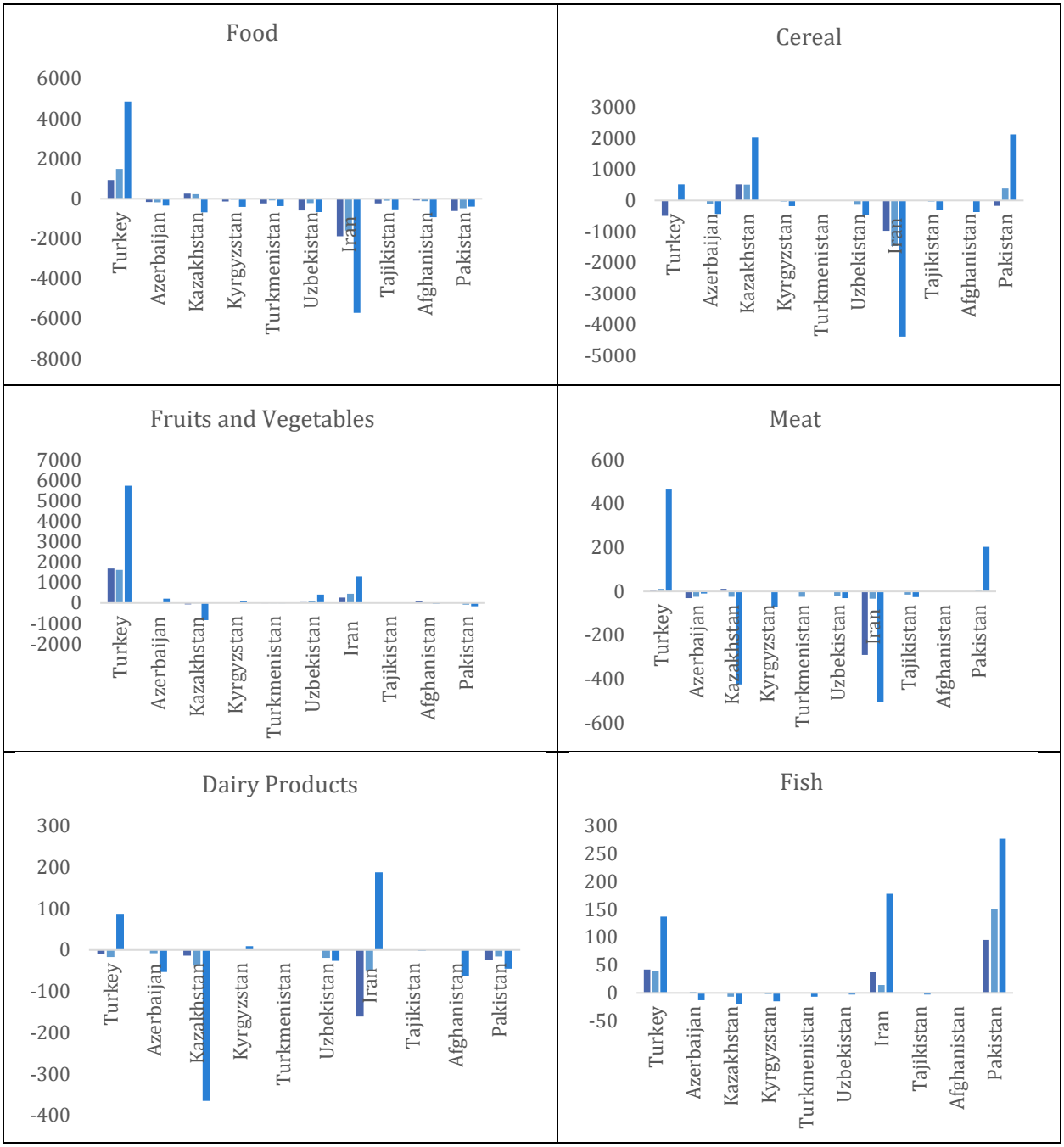
However, country-wise patterns (Figure 5b) suggest a food independence policy is clearly being followed only in Pakistan since 1990, resulting in a trade surplus in cereal production and trade deficit in fruits and vegetable (ibid). In the remaining two high food deficit countries, Afghanistan and Tajikistan, there is reliance on global markets, as of 2014,

Table 5.1: Net Trade of Food Groups Across Food Deficit Regions



Source: FAO (2017)

Table 5.2: Country-wise Net Trade of Different Food Groups



Source: FAO (2017)

for securing the cereal requirements of their populations along with marginal trade surplus and a marginal trade deficit in fruits and vegetable production. These patterns are contrary to the average behavior observed for the high food deficit group in the context of food sufficiency or diversification, suggesting trends in Pakistan are overshadowing the others. In the case of the low food deficit group, the countries which are showing clear evidence of a policy of diversification into fruits and vegetable are Iran and Turkey, with Turkey being secure in terms of cereal production too with a small trade surplus in cereal in 2014 and Iran relying on cereal imports to fulfill its staple food needs (Appendix Tables 3.44a and 3.45a). However, both these countries have a positive trade surplus in fruits and vegetable with growth after 2000 of 253.1 percent (Turkey) and 188.7 percent (Iran).

In the remaining low food deficit countries, tendencies for food diversification policy are evident (figure 5b) for Azerbaijan, Kyrgyzstan, and Uzbekistan while for Kazakhstan there is clear evidence of food independence and self-sufficiency policy with growth in cereal trade surplus and negative net trade in fruits and vegetables (Appendix Tables 3.44a, 3.44b, 3.45a and 3.45b).

Thus, there is evidence of implementation of a policy of diversification into fruits and vegetables and reliance on global markets for meeting cereal requirements in the low food deficit countries, and a policy of achieving self-sufficiency in cereal requirements in Kazakhstan. No clear pattern emerges in the data for Turkmenistan (Appendix Tables 3.44a and 3.45a). On the other hand, in the high food deficit countries there is evidence in

support of a policy of self-sufficiency in Pakistan, while in Afghanistan and Tajikistan, there is evidence of dependence on global markets for meeting cereal requirements.

At an aggregate level we are seeing a clear advantage of high food deficit region in meat and fish production with positive and substantial higher trade surplus in these products for the years 1990, 2000 and 2014 (Appendix Tables 3.46a and 3.47a), while there is a trade deficit in dairy products for both low and high food deficit groups, though the extent is less for low food deficit group in 2014 (Appendix 3.48a). At a disaggregated level, the only country that is food secure is Turkey in this aspect which has trade surplus in all three categories of meat, fish and dairy products so not only it is meeting its national requirements but is also exporting to other regions (Appendix Tables 3.46a, 3.47a and 3.48a). Moreover, only Pakistan has a trade surplus in both fish and meat, and Iran in dairy products and fish production. All other countries are dependent on food imports in these categories to meet their animal protein requirements despite having growth in their local production of meat, livestock and milk (ibid). Overall there is a focus on providing more animal protein products in response to changing dietary patterns, however except for Turkey and Pakistan, these countries are not yet food secure (in terms of meeting their own local demand) therefore the possibility of exporting is moot.

5.4. Conclusion

This chapter has placed the discussion in terms of structural differences between low and high food deficit country groups within the region in terms of how successful the countries have been in meeting MDG hunger targets. The discussion has also touched upon

diversification and self-sufficiency in agricultural production and trading patterns in these areas, and country responses to increased domestic and international demand for animal protein products.

The agriculture sector has been found to be more productive in low food deficit countries than in countries which could not eliminate hunger from their boundaries as per MDGs deadlines. This clearly suggests that the agriculture sector and rural development are important pieces in puzzle of how best to achieve a hunger free domain.

Furthermore, in terms of demographic dynamics, low food deficit countries have protected themselves from population pressures by keeping population growth rates at substantially lower levels on average than high food deficit countries. Therefore, population control is an important aspect in ensuring food security within an economy that needs to be highlighted especially in context of Afghanistan and Pakistan - the two high food deficit countries that have substantially high population growth rates coupled with rising proportions of undernourished population.

The analysis of structural differences in terms of indicators of agricultural and overall macroeconomic performance across low and high food deficit areas suggests that not only have the low food deficit countries performed better on average in terms of eradicating hunger but also in terms of better performance of the agricultural sector and macroeconomic performance. From this we can infer that the policies followed within these regions were not just centered on hunger elimination through pro-poor strategies,

but such an end was achieved in face of well-rounded and comprehensive structural programs that not only improved their overall internal economic stability but also created positive avenues of agricultural growth and positive feedback effects across agriculture and other sectors of the economy. Hence agricultural and rural development is an important point of focus in fight against undernourishment but in this process the link across agricultural productivity to overall economic environment cannot be ignored.

With some exceptions, all ECO countries are investing in their food base to secure the domestic food supply especially in terms of staple food and non-staple food items like vegetables and fruits, roots and tubers, meat, livestock and milk products. This is evident not only in growth patterns post 2000 in all these food items within aggregation into low and high food deficit ECO zones and in upward trend in these food groups within period 2000-14 for most ECO countries. Hence overall food production is growing within ECO region. However irrespective of increasing domestic productive base within each ECO country, over time an increasing trend of dependence on global markets for food items is observed. Overall trade deficits in food items are increasing over time in most ECO countries except Pakistan (decreasing) and Turkey (trade surplus in food categories).

Overall in five low food deficit countries namely Turkey, Iran, Azerbaijan, Kyrgyzstan, and Uzbekistan, implementation of policy of diversification in fruits and vegetables and reliance on international markets for cereal requirements is evident. In one country (Kazakhstan) a policy of self-sufficiency in cereal requirements is also implemented, while in Turkmenistan there are no clear patterns in the context of

diversification and/ or food independence policy. In the high food deficit zone in Pakistan there is a policy of self-sufficiency, while in Afghanistan and Tajikistan, contrary to the traditional focus on food independence policy, there is evidence of dependence on global markets to meet cereal needs.

From patterns relating to production and net trade indicator for meat, fish and dairy products for each ECO country it has been observed that there is definitely a focus on providing more animal protein products in response to changing dietary patterns. However, except for Turkey and Pakistan, none of the countries are secure in meeting even their own local demand.

Chapter 6 - Food Price Issues

6.1. Introduction

At domestic level studying food price is important because in most countries food prices, especially of staple food items, are controlled by government as these define production incentives for the farmers while inflation rate has direct relevance for food security of overall population (both net buyers and net sellers). Hence the government must weigh conflicting interests of net sellers of food items (that is higher food prices to increase their profitability) and those of net consumers of food (that is lower food inflation). The government must also place these important pricing variables -- food price level and food price inflation -- in the context of changes in international markets to protect their population from any external price shocks. However, in our analysis of food prices and its forecast we have three major data limitation that we need to go around which are as follows:

Firstly, data on food prices is available for only three countries; i.e. Turkey, Iran and Pakistan for the time period 2000 to 2014, so analysis of food prices is restricted to these countries only. Secondly, data on food prices is only available at the aggregate level for Iran, Turkey, and Pakistan[54] which further limits the analysis regarding country responses to international food price shocks of 2007-08 and 2010-11 and international fuel shock of

[54] The only available information on food prices for the ECO region is what has been publicly provided on the FAOSTAT website.

2014-15. A more detailed analysis would require information on prices at disaggregated level by food groups and by matching patterns of such prices (both actual and their forecasts) overtime with global prices levels for each of such food group.

With these limitations the only analysis that can be done in context of food prices and its inflation rate using actual and forecast values is to assess the extent of the risk faced by each ECO country to international price shock whereby in three countries that is Turkey, Iran and Pakistan we will rely on evidence from food prices and its inflation rate directly so as to evaluate how much of impact was transferred from global market into domestic price levels in these countries at data points of two food price shocks that is 2007-08 and 2010-11 within actual food price series and at 2015 onwards to trace impact of decrease in global oil prices in forecasted price series but for other countries we will take an indirect route so as to assess how dependent these countries are on cereal imports and what is their position in terms of accumulation of foreign reserves etc.

6.2. Vulnerability to Price Shocks

Vulnerability in food supply and access for the population can be of many types, it can be generated though both price and non-price mechanisms, that is both via international price shocks and domestic pressure (Sinha, Lipton and Yaqub, 2002; Meerman and Aphane, 2012; FAO, IFAD and WFP, 2015). Hence a stable and secure food supply in a country calls for an environment where food generation processes can respond effectively not only to changing demand patterns of its population but also require built-in mechanism to protect one's population from demand and price shocks arising from

evolving global environment. All this requires balance across different set of policies within an economy such as agricultural policy, trade policy and policies related to overall macroeconomic management to name a few. Challenges facing ECO region in the context of risk from changes in global food markets arise.

The following three prominent channels of impact need analysis within ECO region. Firstly, the impact of two recent major international food price shocks originating from changes in international demand for cereal (in 2007-08 and 2010-11) and a decrease in global oil prices (in 2014-15). Secondly, how countries are coping with changing domestic and international demand patterns where there is a clear shift towards high protein products and away from staple foods. Thirdly and most importantly, which policy focus a country has that is food independence policy in sense of being self-sufficient in its staple food requirement through local production and/or diversification away from food crops into high value non-staple food crops in face of evolving international food demands.

The discussion pertaining to above second and third questions will not be tackled in this section due to lack of required information on pricing behavior by food groups for any country in the region[55]. Hence in the light of data restrictions, prime focus of the analysis in this section will be regarding vulnerabilities of countries in the ECO region to international price shocks.

[55]Hence in context of the capabilities of ECO countries in meeting much higher local and foreign demand for animal protein and self-sufficiency in staple food production versus diversification debate, the analysis will remain limited to that through production and trade patterns by food groups.

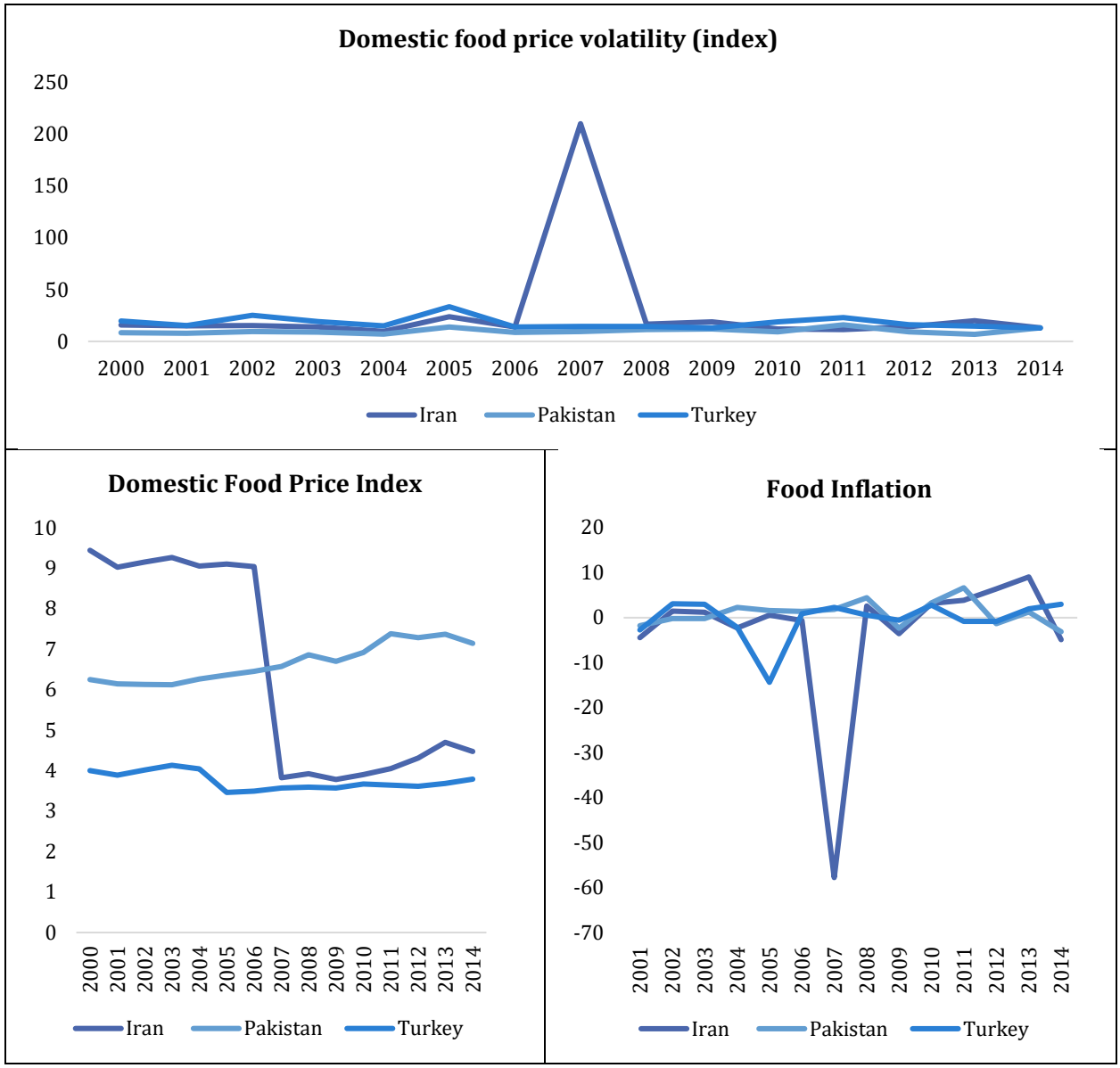
6.2.1. Food and Oil Price Shocks

At first level of evaluation for countries namely Pakistan, Iran and Turkey for which data on food price index is available, it will be seen how food price index along with analysis of food price inflation and food price variability has evolved overtime to see the extent of these shocks on domestic food prices. However since we have limited data on food prices within ECO region, hence to assess the question of vulnerability for the whole region at second level of analysis we will rely on indirect approach in which through tracing the extent of dependence of each ECO country on global market along with its ability to support such external reliance, we will assess how in case of plausible international price shocks which ECO country has capacity to buffer itself through its foreign reserves and which is left vulnerable. In this indirect approach we will try to answer following policy queries:

What is the level and extent of food production and what are growth patterns pre and post 2000 benchmark in value of food production for low and high food deficits countries? Furthermore, is this growth in food production sufficient to meet the demand for staple food or is there some sort of external dependence?

Moreover, in case there exists reliance on global markets to fill-in on staple food shortages, then to what extent are economies vulnerable to external price shocks such as global food price shocks, oil shocks, and financial crisis?

Figure 6.1: Dynamics of Domestic Food Prices in Iran, Pakistan and Turkey



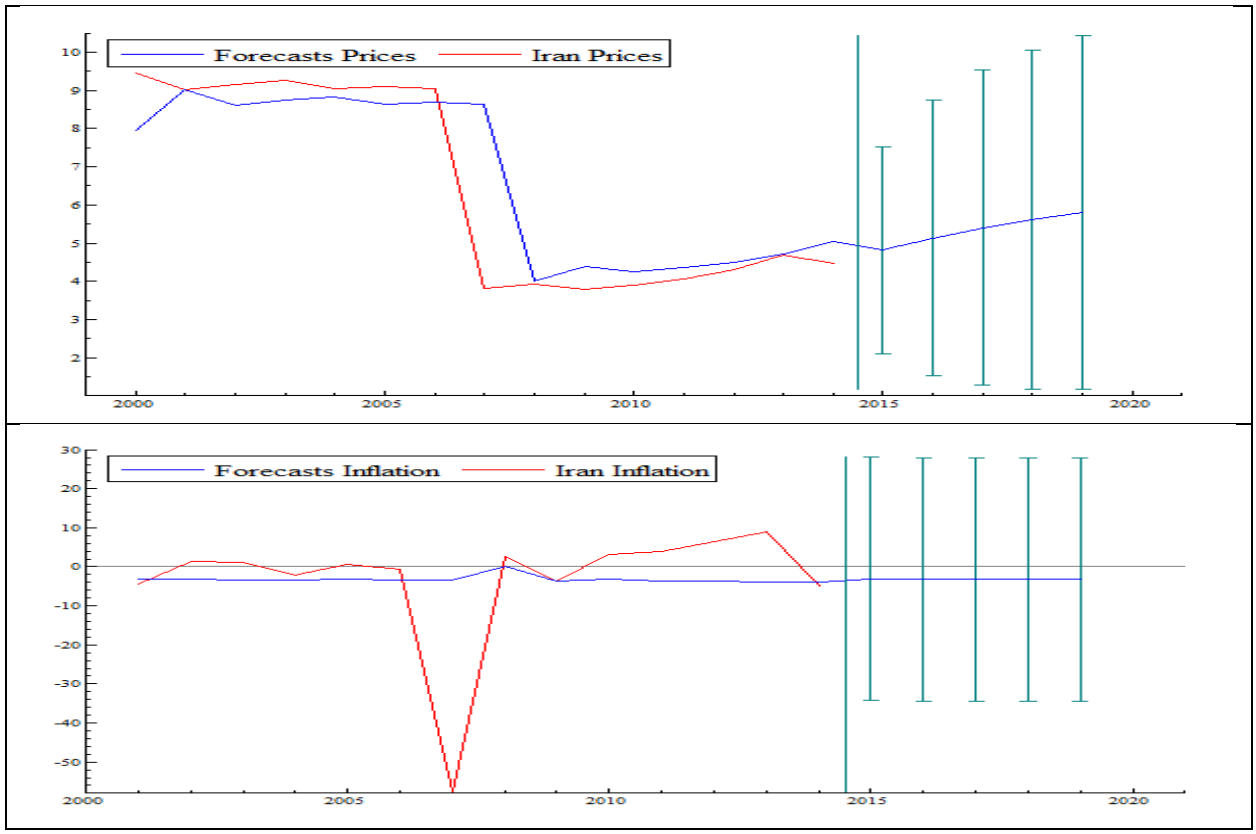
Source: FAO (2017)

6.2.1.1. Iran

Iran is the only country that was documenting prominent variability in food prices at time of first price shock (2007 – 08). However, a closer look at this period shows that rather than seeing increase in food prices a dramatic decrease in domestic food prices (both in its level and its rate of change) is observed. The result is a considerable decline in

food inflation at the time of 2007-08 price shock despite high dependence on global markets for cereal procurement (Figures 1, 2 and 5). Hence though Iran may have reliance on international food markets for covering its staple requirement, yet it is not vulnerable to international price shocks (evident from patterns in figures 1, 2 and 5).

Figure 6.2: Dynamics of Domestic Food Prices and Inflation in Iran



Note: In sample and out of sample forecasts for food price data of Iran (log-likelihood -26.423, ARMA (1,0,1) 2000-2014) and in sample and out of sample forecasts for food inflation (log-likelihood: -58.303; ARMA (1,0,0); 2001-2014) (For supporting ACF and PAC plots refer to appendix figures A.4.1 and A.4.2).
Source: FAO (2017)

It is evident that Iran maintained food prices at much lower levels than the pre-shock level from 2007 onwards, but in the case of the second shock of 2010-11, though prices increased somewhat with food inflation taking a peak around 2013 and reaching close to double digit figures (Appendix Tables 4.2 and 4.3). In terms of patterns in

forecasted food price levels and inflation rate for food as a group, there is an increasing trend[56], and a constant trend in inflation rate within the forecasted duration of 2015-19 (Figure 2). Furthermore, though Iranian government may have supported food prices at much lower levels than 2006 prices, yet the increasing trend after 2009 both in actual and forecasted food prices indicates that the profitability of farmers is a policy concern. However which food groups are being prioritized (for example cereal versus non-cereal crops) by creating price incentives to increase production of food cannot be assessed due to lack of disaggregated price data by food groups. Since the policy variable of concern for net buyers of food is inflation rate and not food prices, food inflation facing consumers reached close to double digits in 2013 but it decreased substantially in 2014 (Figure 1). This suggests the government is taking on considerable fiscal burden to support both net buyers and net producers of food.

6.2.1.2. Turkey

In the case of Turkey there is evidence of little effect of international food price shocks on domestic food prices (both in terms of impact on its level and/or on its rate of change). Looking closely at food price levels and its inflation rate in Turkey, just like the dip in 2007 in Iran, there is a substantial decrease in both food prices and food inflation in 2005. Prices and inflation do not recover their pre-2005 levels in the decade that follows; evidence that in Turkey (just like in Iran), the government appears to be playing a

[56] Increasing trend in forecasted food price series may very well be reflection of negative impact of substantial decrease in global oil prices in 2014-15 since Iran is net exporter of oil and decrease in value of its oil exports and hence oil revenues may have generated a heavy macroeconomic shock within its economy.

proactive role where not only consumers are supported by keeping food inflation in check at sustainable levels but also food production incentives are being defined through management of food prices.

Figure 6.3: Dynamics of Domestic Food Prices and Inflation in Turkey

Note: In sample and out of sample forecasts for food price data of Turkey (log-likelihood 6.223; ARMA (1, 0, 0); 2000-2014) and in sample and out of sample forecasts for food inflation data of Turkey (log-likelihood -40.406; ARMA (1,0,0); 2001-2014). For supporting ACF and PAC plots please refer to appendix figures A.4.1 and A.4.2.
Source: FAO (2017)

At one level patterns within Turkey not only remain lower than pre-2005 values even till 2014 with a slight declining trend in food price forecast during 2015-19[57] but in terms of comparison with Iran and Pakistan, food prices in Turkey stand at lowest levels at all data points. In terms of food inflation, patterns within Turkey do show increased peaks at point of impact of the two international price shocks at 2007-08 and 2010-11. However, food inflation even at these peaks remain less than 3.0 percent and at sustainable single digit value unlike Pakistan where food inflation exceeded 6 percent at all data points and Iran which though has low food inflation in most data points but still documents high rate of change in food prices of magnitude 6.41 percent in 2012 and 9.04 percent in 2013 (Appendix Table 4.3)[58].

Hence overall Turkey is among the most stable ECO country in terms of stability of food inflation and food prices. These patterns match not only the relative strongest position of Turkey within the region in terms of its income level (both with and without population adjustments) and other indicators related to socio-economic development and agricultural productivity but also in context of its comparative strength in context of access to and accumulation of international reserves.

[57] Since Turkey is an importer of oil, the declining trend in forecasted food prices after 2015 may very well reflect impact of fall in global oil prices that occurred in 2014-2015 (Figure 3).

[58] The forecasted inflation rate for Turkey has a constant trend. However, since in-sample forecasted values do not match well with the actual data patterns within 2001-2014, the constant pattern of forecasted inflation rate in Turkey has no analytical relevance in the present context.

6.2.1.3. Pakistan

Unlike Iran and Turkey where the government demonstrated capacity to effectively buffer both food prices and food inflation from international price shocks keeping the interest of both food producers and consumers intact, Pakistan demonstrates signs that it was impacted the most by the two price hikes of 2007-08 and 2010-11. It is evident that there was a sharp increasing trend in food prices during the period 2006-2011 along with substantial increases in food inflation at the time of the two shocks. This reflects the much more binding internal constraints for Pakistan (highlighted earlier in Chapter 3).

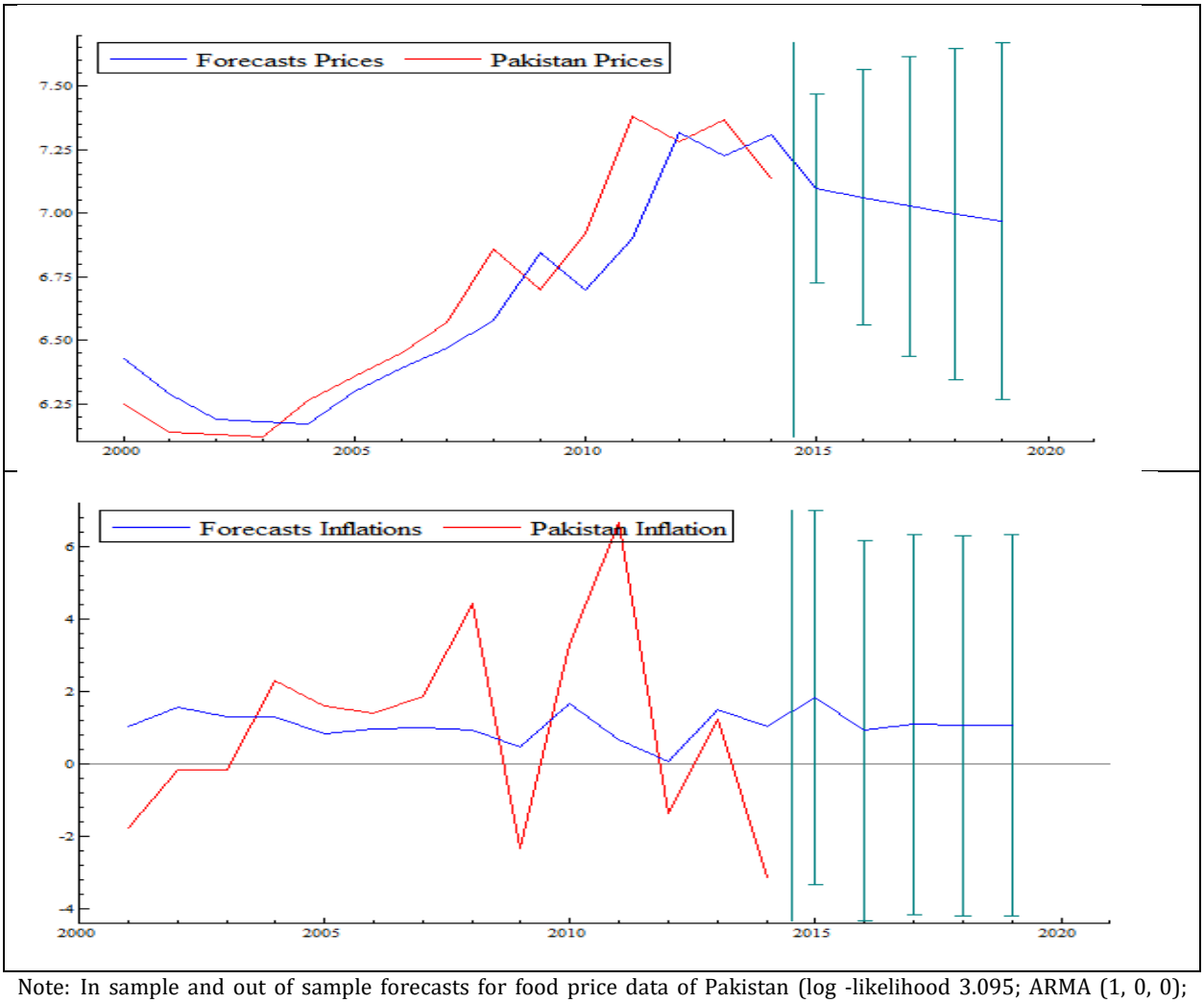
After 2011, a declining trend is evident in food prices and forecasted food prices as well during the 2015 – 19 period[59], along with food inflation rate being managed below 2 percent (both in actual data values and in patterns of forecasted inflation rate).

Besides the issue of how domestic food price level and its inflation rate have been impacted by international price shocks, important vulnerabilities have emerged from the patterns in net food trade (figure 5). While the trade deficit in overall food exchanges in international markets is evident, there is a positive trend between the period 2000 to 2014 (figure 5; Appendix Table 4.5a and 4.5b). Furthermore, there is a negative cereal import dependency after 2000 with a downward trend across 2000 and 2014, along with an accumulated stock of foreign reserves available to cover food requirement which are

[59] Given Pakistan is importer of oil just like Turkey within ECO region hence declining trend in forecasted food prices in Pakistan post 2015 may very well reflect impact of fall in global oil price that occurred in 2014-2015 (Figure 4).

showing a positive trend over time after 2000 (Figure 5; Appendix Tables 4.6a, 4.6b, 4.7a and 4.7b). While promising, the stock of foreign reserves is much lower than the regional average, and compared to Iran and Turkey, the stock is less by a proportion of 91.9 percent and 92.8 percent respectively (Appendix Tables 4.7a). Hence there exist inherent vulnerabilities within the economy that need to be addressed.

Figure 6.4: Dynamics of Domestic Food Prices and Inflation in Pakistan



Note: In sample and out of sample forecasts for food price data of Pakistan (log -likelihood 3.095; ARMA (1, 0, 0); 2000-2014) and in sample and out of sample forecasts for food inflation data of Pakistan (log-likelihood -33.140; ARMA (1,0,0); 2001-2014). For supporting ACF and PAC plots please refer to appendix figures A.4.1 and A.4.2.
Source: FAO (2017)

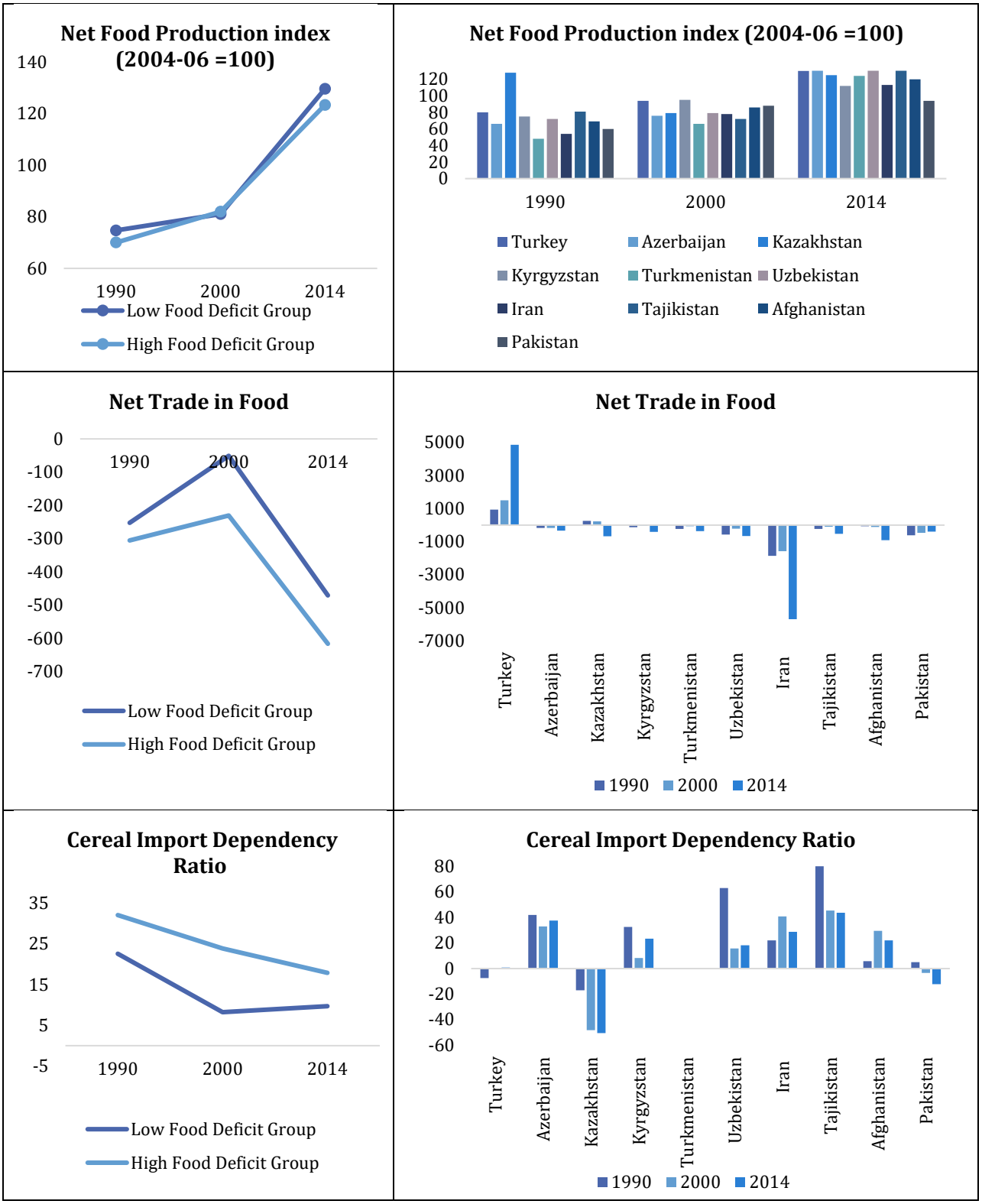
6.2.1.4. Food Production Response

In the context of profiling responses for the remaining ECO countries with no or limited data on food prices, an indirect approach is adopted. Overall, we can see that food production has gone up in ECO region, however from patterns in figure 5 it is evident that post 2000 the growth in food production is slightly relatively higher for low food deficit region. Net food production index is showing growth for the region with average growth rate of 17.2 percent for 1990-2000 period and 60 percent for 2000-14 period. However, after2000, the magnitude comes out to be higher for low food deficit countries (59.9 percent for low food deficit zone and 50.4 percent for high food deficit zone (Appendix Table 4.4b).

Irrespective of this positive and sizable growth in food production in the region, not only is there on average a trade deficit in food groups as a whole for both high and low food deficit areas, but the magnitude of this deficit has substantially increased for both these regions[60]. Turkey and Kazakhstan are the only two countries that document trade surpluses on average between 1990 and 2014, with Turkey exporting more than it imported consistently, while Kazakhstan's net trade indicator in food items was positive between 1990 and 2000 and negative in 2014 (Appendix Table 4.5a). In the case of cereal import dependency ratio (figure 5), except for Turkey, Kazakhstan and Pakistan which have negative cereal import dependency and hence are suppliers of cereal in world market, all other countries are showing positive dependence on the world market for meeting their

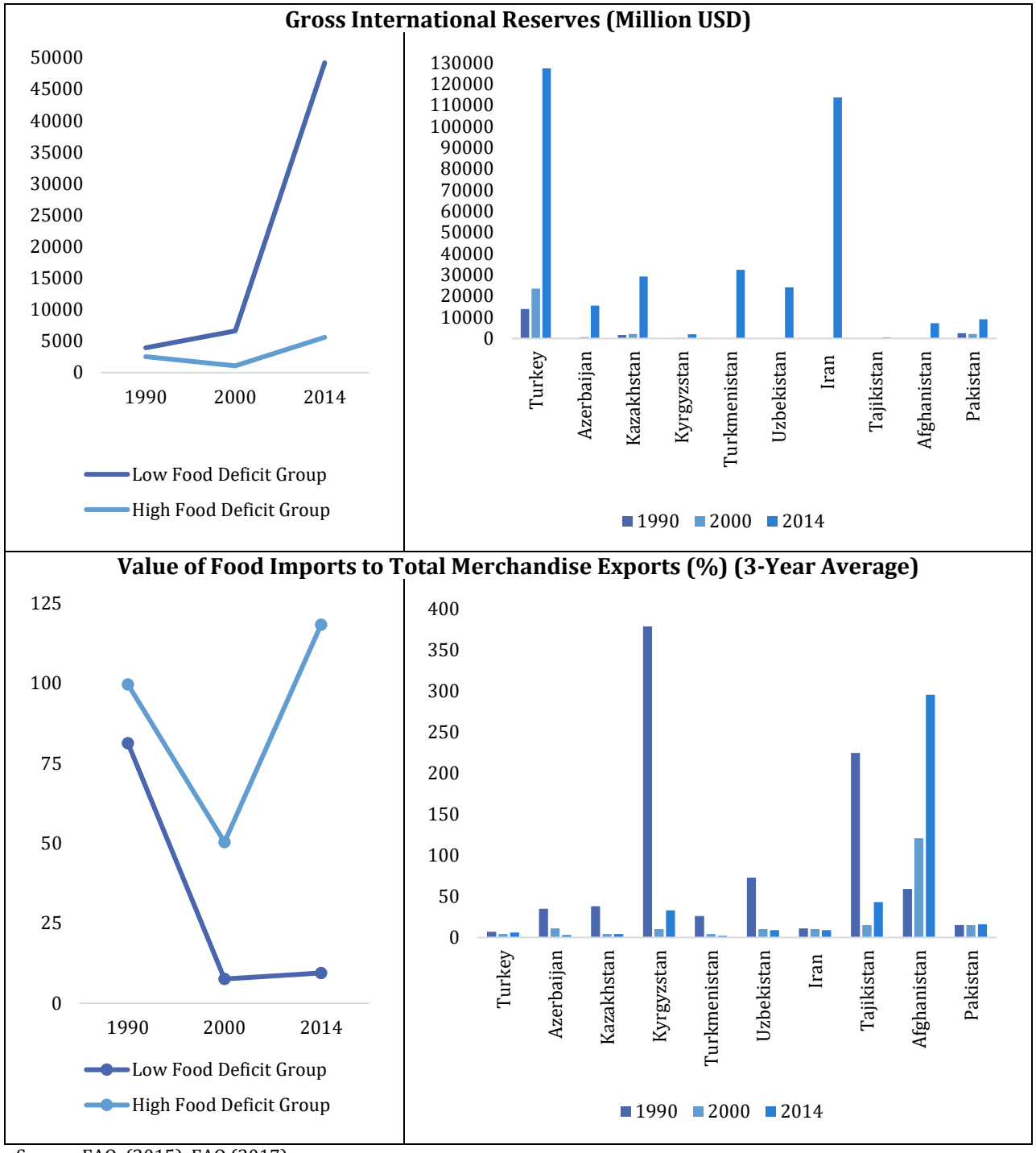
[60] Net trade deficit in food items is growing at rate of 167 percent for high food deficit zone and 825 percent for low food deficit zone (Appendix Tables 4.5a and 4.5b).

Figure 6.5: Assessment of Vulnerability to International Price Shock



Source: FAO (2015); FAO (2017)

Figure 6.6: Assessment of Vulnerability to International Price Shocks (Contd.)



Source: FAO, (2015), FAO (2017)

cereal demands (Appendix Table 4.6a). Therefore, we can conclude from these patterns that except for Turkey[61] all other countries have positive dependence on global markets for meeting their overall food requirements in one sense or another.

6.2.2. Policy Responses

The important policy question that emerges in light of this reliance of most ECO countries on international food markets is how to identify the countries that are most likely to face crisis in case of sudden increase in food prices say that of cereal as has happened in recent past in 2007-08 and in 2010-11. This vulnerability in the analysis will be checked through patterns in two indicators; that is extent of Gross International Reserves in a country from regional mean and how ratio of food import value to total merchandise exports has evolved over time. Through this analysis, ECO countries can be divided into three categories namely countries at Extreme Risk, Countries at No Risk and Counties at Moderate Risk to International Price Shocks:

ECO Countries at Extreme Risk in Face of International Price Shock: In terms of how far the stock of gross foreign reserves is from regional mean for the region as whole, the four ECO countries that show significant risks are Tajikistan, Kyrgyzstan, Afghanistan and Pakistan. Foreign reserves in these countries are below the regional mean (98.5

[61] Pakistan and Kazakhstan though have negative cereal import dependency but have overall food trade deficit as per 2014 estimates, hence these countries may be self-sufficient in cereal but dependent on international food supply for their other food requirements (Figure 5).

percent, 94.5 percent, 79.9 percent and 74.8 percent of the regional average respectively) as per 2014 estimates (Appendix Table 4.7a).

ECO Countries at No Risk in Face of International Price Shock: In contrast to these countries, Turkey and Iran are most protected with much higher stock of foreign reserves than regional means (252 percent and 214 percent of the regional average in year 2014). This endorses the previous analysis through assessment of food price and food inflation evolution overtime.

ECO Countries at Moderate Risk in Face of International Price Shock: Within low food deficit ECO countries there are some other countries which have stock of foreign reserves below ECO mean as per 2014 values namely Azerbaijan (less by 56.9 percent), Uzbekistan (less by 33.1 percent), Kazakhstan (less by19.1 percent) and Turkmenistan (less by10.3 percent) (Appendix Table 4.7a). However in comparison with Tajikistan, Kyrgyzstan, Afghanistan and Pakistan not only these countries are found to be much better placed in terms of availability of foreign reserves as of 2014 computations[62] but also once we match these patterns with that of food imports to total merchandise trade, we find that this ratio is not only relatively much lower than regional average value for these countries (being less by 92.8 percent in Azerbaijan, less by 78.6 percent in Uzbekistan, less by 90.4

[62] Stock for foreign reserves in 2014 come out to be USD 15,549 million in Azerbaijan, USD 24,140 million in Uzbekistan, USD 29,209 million in Kazakhstan, USD 32,400 million in Turkmenistan and that for Tajikistan, Kyrgyzstan, Afghanistan and Pakistan come out to be USD 511 million, USD 1,958 million, USD 7,248 million and USD 9,098 million respectively (Appendix Table 4.7a).

percent in Kazakhstan and 95.5 percent in Turkmenistan) but is also decreasing overtime within each of these countries (Appendix Tables 4.8a and 4.8b).

In contrast to the patterns above, estimates for Tajikistan, Kyrgyzstan, Afghanistan and Pakistan reveal not only within these countries the ratio of food import value to total merchandise exports in year 2014 to be higher than regional mean value by proportion of 603 percent in Afghanistan and 2.13 percent in Tajikistan and less by much lower proportion of 21.6 percent in Kyrgyzstan and 61.99 percent in Pakistan as compared to that in Azerbaijan (- 92.8 percent), Uzbekistan (-78.6 percent), Kazakhstan (- 90.4 percent) and Turkmenistan (- 90.4 percent) (Appendix Table 3.42a) but also this ratio to be increasing overtime post 2000 (Appendix 4.8b).

Hence in comparative terms these counties are vulnerable to much less degree to external price shocks than Tajikistan, Kyrgyzstan, Afghanistan and Pakistan but nevertheless irrespective of these facts and figures from anecdotal country specific evidence we find that Azerbaijan, Kazakhstan Turkmenistan and Uzbekistan have been impacted from shocks emerging from global changes whereby first three economies in this group clearly being oil exporters are vulnerable to global decline in oil prices especially of drastic negative shock of 2015[63]. Though Uzbekistan is not an oil exporter but its reliance on external economies like Russia makes it vulnerability to external price shocks[64].

[63] Please refer to Chapter 8 for detailed discussion of country specific circumstantial evidence.
[64] Please refer to country specific analysis in Chapter 8 for more detailed discussion.

It is clear from patterns in Gross International Reserves and ratio of food import value to total merchandise exports that the four ECO countries which can be considered vulnerable to a possible price hike in international food markets are Tajikistan, Kyrgyzstan, Afghanistan and Pakistan given these countries have much lower amount of foreign reserves than other ECO countries while countries which are at risk to much lower degree include Azerbaijan, Uzbekistan, Kazakhstan and Turkmenistan[65]. While the two countries which come out as most protected are Turkey and Iran.

From the above analysis and patterns in figure 1-5, the following key policy insights emerge: Overall food production is growing within ECO region, however irrespective of increasing domestic productive base within each ECO country overtime, we see that dependence on global markets for food items is also increasing. This increased reliance on global market for food items needs to be checked against both evolving patterns in consumer demand and in face of changes in demographic dynamics[66].

Overall trade deficits in food items are increasing overtime in most ECO countries except Pakistan where it is decreasing and Turkey where there is trade surplus. Hence these overall net trade patterns need an assessment both in terms of trade patterns by various food groups and in context of countries' comparative advantage in production of

[65] These findings are endorsed by Akramov and Shreedhar (2012) and IMF (2012) who show that the central Asian countries of Kazakhstan, Kyrgyzstan, Uzbekistan and Tajikistan have been impacted to a far greater extent than other countries by the recent global food price shocks of 2007-08 and 2010-11.

[66] For patterns related to these issues please refer to Chapter 3.

different food items to see how much countries are depending on high value non-stable crops or other food items that are more in line with their agricultural capacities[67].

Finally, within ECO region the four countries that are found to be at risk of being affected greatly by international price shocks are Tajikistan, Kyrgyzstan, Afghanistan and Pakistan. Within Pakistan we can directly see that domestic food prices and food inflation have increased post these shock periods but in the other three countries though we do not have data on food prices for these countries but their vulnerabilities are evident from the fact that these countries are relying heavily on international markets for their food requirements (even that of cereal) in spite of having much lower foreign reserves compared to regional mean value and documenting much lower export base given their value of food imports are much higher in proportion to total merchandise exports than rest of ECO countries and further positive trend in ratio of food imports to total merchandise exports in these three countries show that these tendencies are increasing overtime.

In rest of ECO countries, the two countries which seem quite secure in all dimensions and not vulnerable to price shocks from international food are Turkey and Iran while for remaining ECO countries Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan there is found evidence for some plausible risks, but the extent of such possibility is observed to be much lower than that for Tajikistan, Kyrgyzstan, Afghanistan and Pakistan. In this context the evidence for Turkey and Iran is not only backed by direct analysis of

[67] Please refer to in depth discussion of this issue within analysis of agricultural production and trade patterns by food groups in previous chapter 3.

domestic food prices and food inflation but also through their strong position in foreign reserves while for remaining countries Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan due to non-availability of information on food prices we reach to this conclusion through indirect analysis of extent of cereal import dependency and capacity to buffer against cereal price hikes by stock of international reserves.

6.3. Conclusion

In this chapter we have examined the vulnerability of ECO countries to international price shocks as have happened in recent past in 2007-08 and 2010-11. Through our evaluation of food prices (actual and forecasted values), extent of cereal important dependency and status of stock of foreign reserves we have tried to find out which countries are at risk in their food security post a price hike emerging from changes in international markets (global shocks such as due to evolving global demand of cereal food and/or non-cereal food or changes in oil prices). Let us highlight key insights in this context:

- ECO Countries at Extreme Risk in Face of International Price Shock: Within ECO region the four countries that are found to be at risk of being affected greatly by international price shocks are Tajikistan, Kyrgyzstan, Afghanistan and Pakistan.

- ECO Countries at No Risk in Face of International Price Shock: The two ECO countries which seem quite secure in all dimensions and not responsive to price shocks from international food are Turkey and Iran.

- ECO Countries at Moderate Risk in Face of International Price Shock: Remaining four ECO countries Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan there is found evidence for some plausible risks, but the extent of such possibility is observed to be much lower than that for Tajikistan, Kyrgyzstan, Afghanistan and Pakistan.

Chapter 7 - Challenges and Opportunities for Collaboration

7.1. Introduction

It is evident that ECO region is facing double burden of undernourishment whereby countries that have met MDG targets are facing primarily burden of over-nourishment with some evidence of children suffering from stunted growth. On the other hand, high food deficit countries are struggling with undernourishment and its impact in chronic forms such as stunted, underweight and wasted growth in children under age five. Hence at regional level it seems that different policy responses may be required to achieve food security given different structure of the problem in two sets of ECO region (low and high food deficit zone). On a closer look, however, there are more commonalities in both these regions than meet the eye at first glance given sustainability of process that helped low food deficit countries to reduce hunger[68].

Hence in terms of collaborative action within ECO region there are many common themes that can benefit both sets of countries irrespective of what structure of food insecurity they are facing. Drawing on findings on structural elements within our analysis –

[68] In terms of hunger elimination target for a country the key changes are how to maintain a sustainable and accessible supply of healthy, safe and well balanced diet within one's population. Though low food deficit ECO countries are way ahead in dealing with hunger both in transient and chronic forms than high food deficit ECO countries namely Afghanistan, Pakistan and Tajikistan but they still face the challenge of keeping the process going so as to maintain their food secure status. So, their policy challenge is no different than high food deficit ECO countries as key hurdle for both these region is not only elimination of hunger but also sustainability of hunger reduction process – answer to which lie in identification of the structural factors that need corrective action to meet such a food secure end - a research question that is equally relevant for both low and high food deficit countries.

presence of which has benefited the low food deficit ECO region (in both hunger reduction process and its sustainability) and absence of which is keeping high food deficit ECO countries from achieving food secure end, important areas for combined policy discourse that have come out from discussion in this report and what could be future line of cooperation are discussed below.

7.2. Areas of Cooperation

7.2.1. Nutrition Sensitive Health Policy

The emerging evidence of over-nourishment and obesity within low food deficit ECO countries are a gift of lifestyle changes that come as part and parcel of development such as more preference for animal protein and processed foods in one's diet and a sedentary way of living. However, this pattern though evident only in low food deficit ECO countries does not mitigate this issue in case of high food deficit countries where the analysis shows that even in these countries tendencies for greater preference of animal protein over time are emerging. The rate of this preference is more in low deficit than high deficit countries. In due course with increasing urbanization in Pakistan, Afghanistan and Tajikistan and the lifestyle changes that come along with development this problem will soon emerge in these high food deficit countries as well, unless a remedial action plan is put in place. Hence there is a need to develop a nutrition sensitive health policy both in context of dealing with issue of under and over nourishment both at macro level and grass root micro level.

A few steps in this direction could be awareness campaigns for more balanced diet preference with healthy mix of vegetable and protein (both of animal and non-animal sources), food quality insurance mechanism, and creation of avenues for greater physical activities and exercise. In this context investments need to be made both in software and hardware of the process whereby at one level media campaigns along with school awareness programs can be instituted along with conditional health grants to school going children especially for support of nutritional needs of poor children. Also, targeted health subsidies for general population can be put in place to shape people's attitudes towards healthy choices. Further at more structural level projects that assure there is enough open spaces such as parks, sport facilities along with institutionalized way of monitoring the quality content of food on market shelves to ensure that people have access to health life choices and that too at affordable rates need to be identified through regional discourse and through learning from experience of other low food deficit regions.

7.2.2. Promotion of Rural Economy and Agricultural Sector Development

Promotion of rural economy is extremely important for elimination of hunger from the ECO region as not only rural livelihood is directly associated with supply of food and hence its availability for the whole population but also because the locus of poverty within high food deficit ECO region is primarily in rural side of economy as has been observed within our analysis. Hence strengthening of both farm and non-farm rural activities is most crucial to ensure food availability and to enhance income and livelihood of rural poor that are most vulnerable to hunger. Further from our evaluation of structural factors we have found evidence for agricultural sector development as a key ingredient in ensuring a well-

rounded growth process that can put a country on path of sustainable development whereby our analysis indicates that agriculture growth is backbone for not only ECO countries that are found highly agricultural dependent as in most of high food deficit countries but is also the platform on which the food secure end is based for low food deficit ECO region. This is because agricultural growth not only caters to rural farm and non-farm economy but, through defining a country's food supply base and its position in context of agricultural trade balance and kind of support that industries can get in terms of agricultural inputs, it helps in overall macroeconomic performance. This can be seen from experience of almost all low food deficit ECO countries as high level of productivity in this sector is evident in all these countries and comparatively much slower agricultural performance is found to be documented within high food deficit countries that has further damaged their macroeconomic and food security interests. Hence policies to strengthen rural economy both in its agricultural and non-agricultural activities are extremely important and present a rich avenue for collaborative action across various ECO countries.

One area in this context where clearly high food deficit countries can learn from low deficit countries is how the former countries irrespective of their relatively weaker agricultural endowment have attained much higher rates of agricultural productivity along with relatively much higher rates of water productivity per person. In this context, high yield varieties of seeds and improvement of agricultural technologies can be important factors to improve agricultural productivity. Similarly, there is a need to link urban markets to rural produce through provision of more affordable, energy conserving and effective ways of cold storages, provision of modern agricultural machinery such as threshers to

protect the farmer from climatic shocks, improvement of the rental and/or sale and purchase mechanism within agricultural land markets, and provision of government incentive schemes that ensure much efficient structure of land tenure. Furthermore, there is a need for institutional processes to match the agricultural productivity with farm size as per efficiency criterion, more efficient use of ground water, and conservation of agricultural land both in terms of quality content (protection against soil erosion and waterlogging) and in terms of controlling high rates of agricultural land absorption into urban living. A combined policy discussion across ECO countries on how to improve each country's agricultural productivity both in terms of collaborative research and on ground implementation through medium and long-term action plans can be extremely fruitful.

7.2.3. Diversity across ECO Countries Serves as a Promising Opportunity

Diversity across ECO countries in their resource endowments offers an excellent avenue for collaborative action. Not only ECO region is home to countries that are rich in resources such as gold, oil and gas reserves, coal, uranium, precious metal, aluminum but also includes countries which have strong agricultural and industrialized base[69].

Hence these countries through promotion of regional trade in its various commodities of comparative advantage can create a strong environment of regional

[69] Pakistan has strong textile base and the 5th largest producer, Iran and Azerbaijan, Kazakhstan and Turkmenistan have oil and gas reserves, while Afghanistan enriched with precious and semi-precious gems and famous for hand woven carpets. Uzbekistan has gold and mineral resources and Kyrgyz republic is naturally endowed with gold, coal, uranium and precious metal. Tajikistan is blessed with minerals (specifically aluminum) and Turkey is one of the largest exporters of transport equipment (PIDE ECO, 2018).

cooperation whereby not only they can help in technological transfer in case of industrial and agricultural development and improvement of skill set of human resources but can act as a strong buffer for each other in case of crisis whether climatic, domestic supply shortages or international price hikes such as oil and/or cereal through bilateral and multilateral regional trade agreements. Few avenues that present readily from our analysis is case of some countries which are net oil importers such as Turkey and Pakistan can greatly benefit from the oil exports out of oil producing countries like Iran and Azerbaijan, Kazakhstan and Turkmenistan. Meanwhile these countries (except Kazakhstan) being dependent on cereal imports can supplement their food security ends by having Turkey and Pakistan as suppliers for meeting their domestic staple requirements.

Keeping country-specific interests intact regional-corporation through trade in agricultural products like cereal, vegetable and fruits, meat and dairy, to name a few, as well as other products such as minerals and natural resources like coal, aluminum, uranium, oil and gas reserves as per each country's comparative advantage and its requirement can greatly augment regional macroeconomic stability as well as food security concerns. Further such cooperation does not just extend to regional trade agreement in agricultural products and oil trade but also presents opportunity in development of country's industrial sector. This is so as overall manufacturing sector has shown expansion in almost all the ECO countries, yet this sector lacks diversification in most of the

economies and except for Turkey, Iran and to some extent Pakistan, the manufacturing sector in other economies is dominated by energy and food industries[70].

The need for a diversified base within economy offers an area where ECO countries can again support each other through exchange of knowledge and technical transfers and in due process if each ECO country can gain in agricultural and industrial growth than this indeed will boost overall economy and engender poverty and hunger reduction processes.

7.2.4. Structural Divisions as Per SDG Targets

Lastly, one final avenue where high food deficit countries can learn from low food deficit performance is that how factors such as structural divisions along various lines (gender, rural and urban, macroeconomic and political stability, and ability to protect population from climatic shocks) are so important to affect food security of the entire population. For this very fact such elements have held such an important role in current SDG targets. Awareness campaigns along with institutionalized measures that help in reducing gender imbalances and rural and urban disconnect along with study of preventive measures against extreme climate changes[71] need to be learned from experience of low food deficit countries.

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[70] Turkey is classified as emerging market economy. It has a strong industrial base_ with industries of mine-metal and chemical, automotive, electrical and electronics, textile and clothing and in agriculture. Iran, besides producing petrochemicals, steel and copper products, have significant automobiles, and other light engineering sectors. Pakistan has significant textiles and light engineering sectors (Chapter 3 PIDE ECO Macroeconomic Modelling Project (2018)).

[71] such as extreme temperatures, droughts and floods and environmental damage

Chapter 8 - Country-wise Status of Food Security

The status of food security in individual ECO member countries is reviewed here to provide the proper context for the analysis and discussion of issues related to food security within the ECO region.

8.1. Afghanistan

Within high food deficit ECO zone as per criterion of non-fulfilment of MDG targets by 2015 Afghanistan comes at second rank with population of undernourished standing at 8.6 million and reduction rate of 9.15 percent for undernourishment prevalence across 1990-92 and 2014-2016 time period. Besides non-fulfilment of MDG hunger targets by 2015, Afghanistan just like Pakistan is documenting negative performance in terms of WFS criterion, however the problem of hunger is even more acute in Afghanistan given its population of undernourished people has grown at much faster rate of 126.3 percent than that of 44.2 percent in Pakistan between 1990 and 2015 time periods. Hence in context of Afghanistan there is pressing need to develop an understanding of why size of undernourished population has grown at such a fast pace overtime. A number of structural constraints present in the Afghan economy are hindering it from achieving a food secure status.

Firstly, patterns overtime for the Average Dietary Energy Supply Adequacy (ADES) with its recent available estimates standing at 99 percent clearly indicate that the problem of hunger in Afghanistan is primarily an issue of lack of food access. Furthermore, patterns of relatively much higher poverty rates and much lower GDP levels and its growth rates in

Afghanistan when compared to the ECO regional mean, endorse poverty as a valid constraint in getting to a food secure state of affairs within the Afghan economy (Figure 2).

Moreover, food insecurity is not limited to much higher presence of undernourished population in Afghanistan but to visibly higher rates of stunted and low weight for height in children along with high percentage of children under 5 that have shown incidence of wasting under influence of diseases (Figure 2). A good sign is that number of underweight children have been found to be decreasing overtime indicating emerging tendencies towards improvement in these indicators of chronic hunger. However, problem of stunted growth in children remains an alarming concern for policy makers given that the proportion of such children are found to be increasing overtime in Afghanistan (Figure 2).

Finally, it is important to note that though Afghanistan is among countries which are most agricultural dependent[72] yet has its agricultural productivity at lowest level than that of other ECO countries (Figure 2). This has contributed to cereal import dependency since 2000 and with much lower reserves than regional mean Afghanistan is found to be most vulnerable within ECO region to international price shock originating out of both changes in international demand and supply of cereals and other non-cereal based shocks like oil price hikes, or increased demand of animal protein etc.

[72] Agriculture is critical to Afghanistan's food security (mainly produce wheat and cereals). The majority of Afghans rely on agriculture for their livelihoods and their family's sustenance (PIDE ECO, 2018).

So, what are the key factors that have led to such dismal performance in terms of prevalence of hunger both in transient and chronic forms within Afghanistan? Firstly, in terms of structural constraints, it is important to note that Afghanistan is at much lower level of development than rest of the ECO countries (Figure 2). This can be seen not only by concentration of population in rural sector along with much weaker position of females than males in terms of labor force and educational outcomes within Afghanistan but also in terms of its lowest position within ECO region in terms of indicators related to financial sector development, tax base, GDP level and its growth, agricultural productivity, foreign direct investment, accumulation of foreign reserves, rural and urban poverty levels (Figure 2).

Secondly and most importantly, it is a country that is facing continuous conflict within its boundaries over last three decades resulting into outmigration of 2.5 million Afghans away from their homes and livelihood. This factor of political instability and extreme environment of conflict and terrorism alone can explain to a large extent why Afghanistan is following a path of such underdevelopment and macroeconomic instability and how this country has developed acute form of dependence on foreign aid over the years. After years of negative growth prior to 2002, with support from the Western economies, the country recorded high growth for a number of years[73] after 2008, yet these efforts could not be sustained with the withdrawal of international security forces in 2014. Along with a deteriorating security situation and continuing political uncertainties there

[73] Afghanistan's GDP is now nearly two and a half times greater than it was in 2002 and per capita GDP has increased by 70 percent in only 12 years (PIDE ECO, 2018).

has emerged significant deceleration in economic growth (1.5 percent in 2015)[74] (PIDE ECO, 2018). This slowdown has limited employment opportunities; unemployment has increased to 9.1 percent in 2014 from 8.5 percent in 2012 leading to increase in poverty over the years from 35.8 percent in 2012 to 39.1 percent in 2014 (ibid). Increasing poverty, decrease in employment opportunities, and the deteriorating security situation can be considered as main drivers of out-migration for Afghan people as well as a possible cause of increasing rate of hunger for population that remains within Afghanistan.

[74] With uncertainty leading to a slump in investor and consumer confidence, growth weakened significantly across the board in the non-agricultural sectors, including manufacturing, construction and services (PIDE ECO, 2018).

Figure 8.1: Key Macroeconomic Indicators - Afghanistan

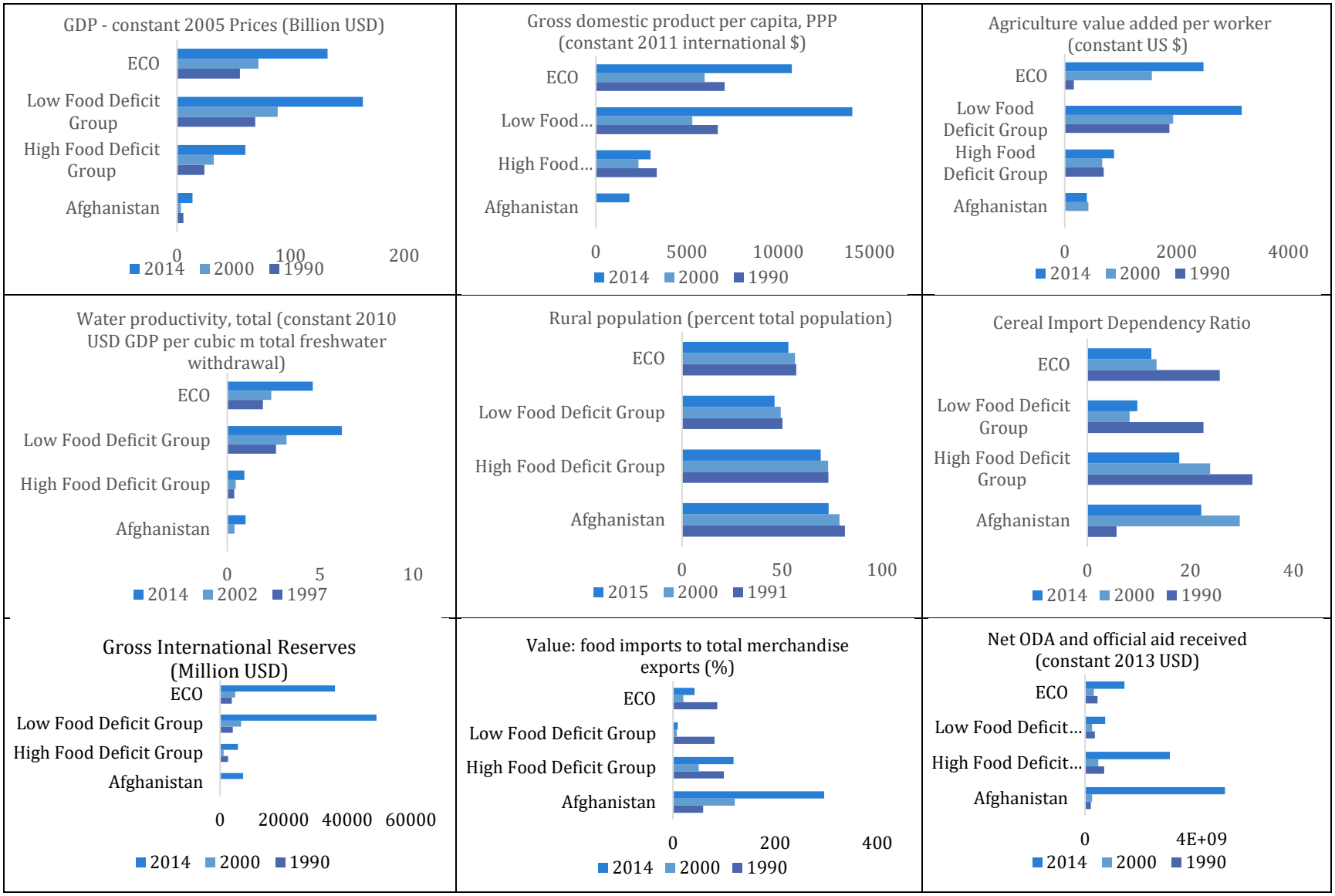


Figure 8.2: Key Macroeconomic Indicators - Afghanistan (Contd.)

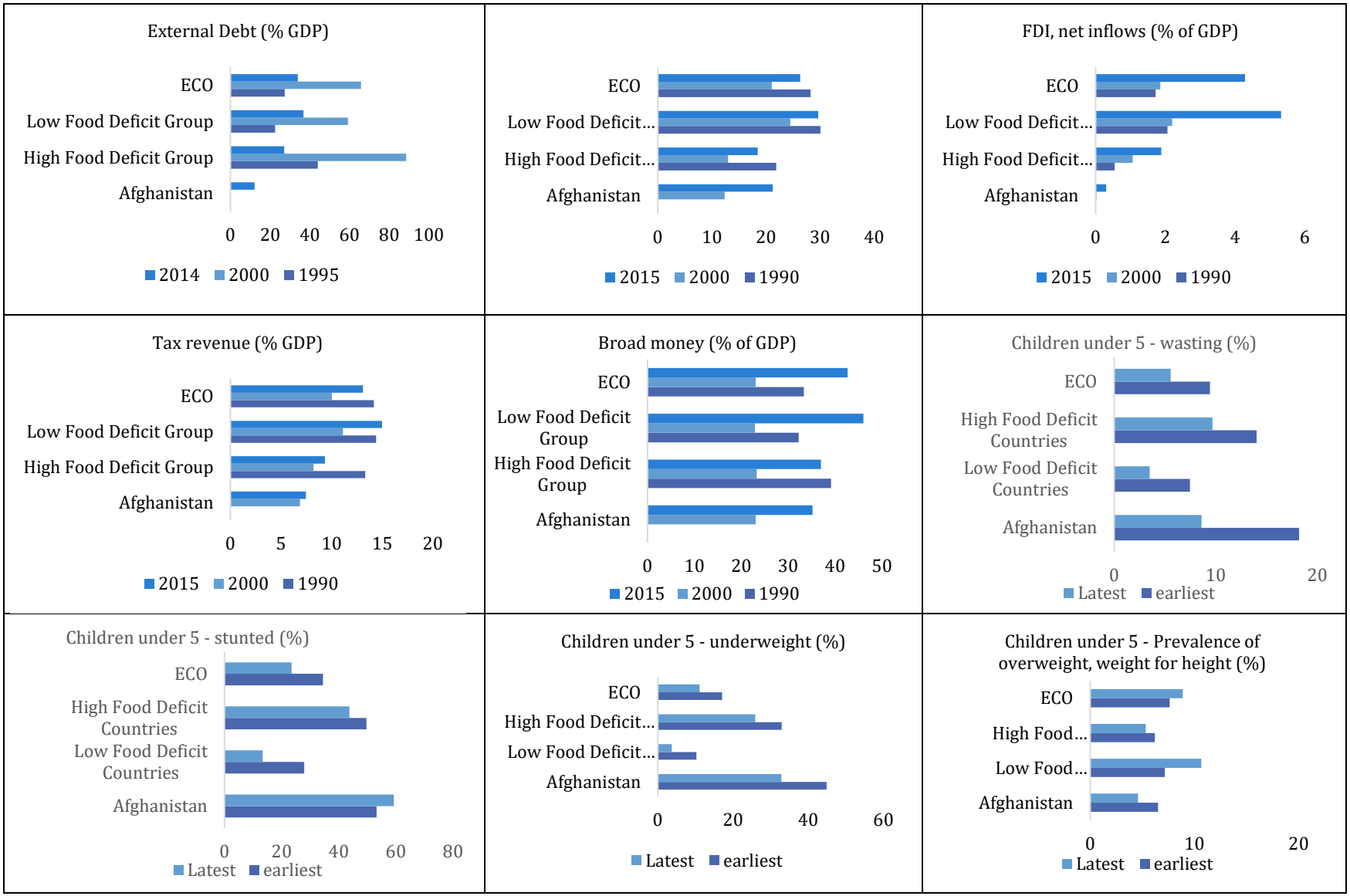
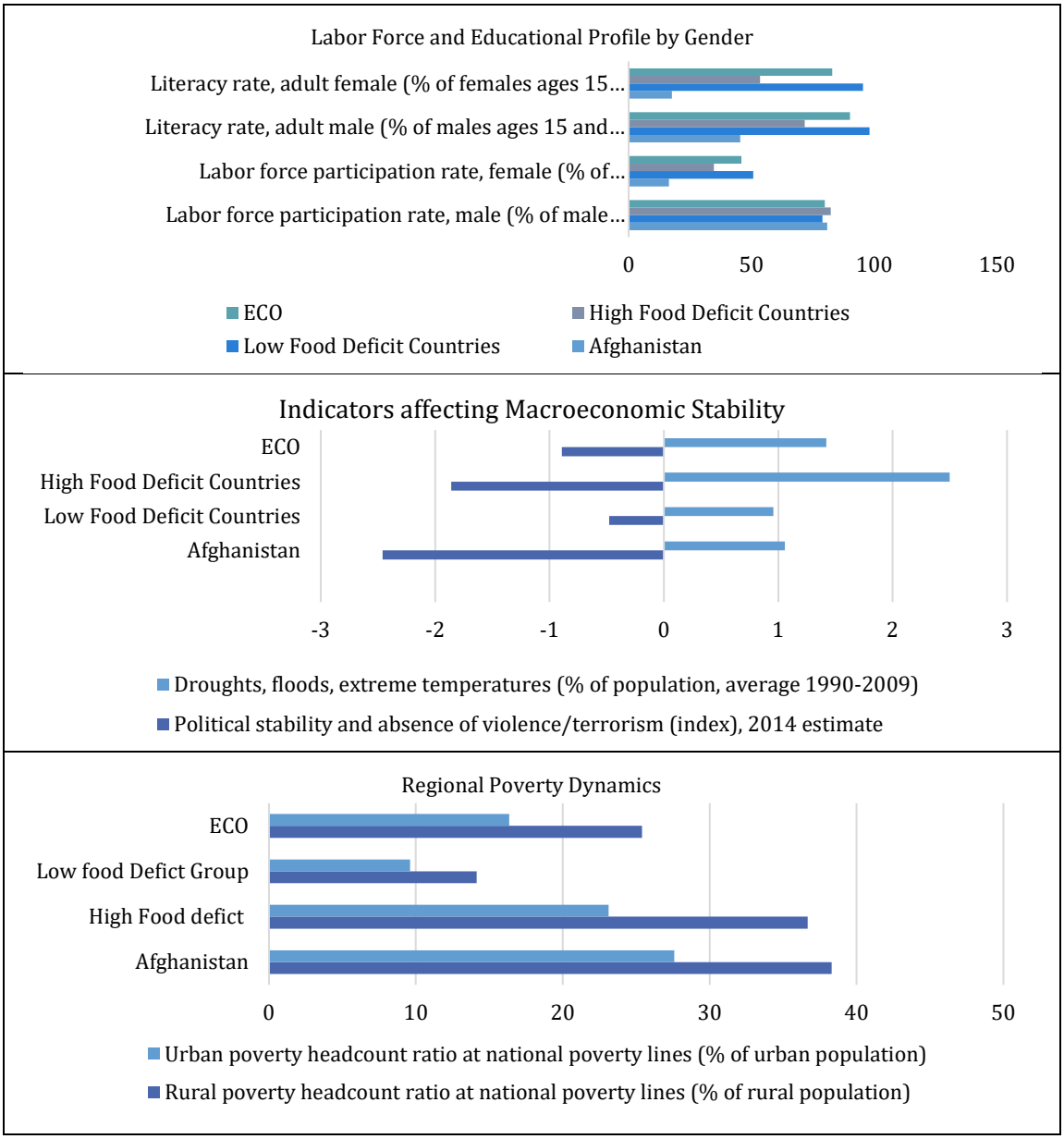


Figure 8.3: Key Macroeconomic Indicators - Afghanistan (Contd.)



Source: (FAO (2017); World Bank (2017b)

8.2. Azerbaijan

Azerbaijan is an oil-based ECO economy that has done well to counter hunger both in terms of undernourished proportion of people and hunger in chronic forms in children. Azerbaijan initiated its comprehensive economic reforms in 1990 that abolished state orders, quoting, and licensing and liberalized the process of foreign trade. Improvements in finance and monetary-credit policy, customs and tax policy have now come to a position where it stands at a unique opportunity to enter the ranks of higher middle-income countries, evidenced by the decline in the poverty rate from 50 percent in 2001 to 6 percent in 2012, and reduction in unemployment rate from 12 percent to 5.0 percent[75].

Azerbaijan is extremely rich in hydrocarbon resources and hence its economy is primarily based on oil revenues. However as of recent policy agenda non-oil sectors that constituted 69.3 percent of the total value-added as per 2015 estimates within Azerbaijan are also being promoted especially post end of oil boom of 2011 and the adverse impact on Azerbaijan in face of decline in oil prices in 2015[76]. Significance of development of the non-oil economy is all the more important especially when current account surplus that had

[75] While some of this improvement was driven by high growth rates (high GDP growth rates have been observed till 2009 along with no impact of global financial crisis in Azerbaijan), a strong increase in wages, and the introduction of a well-targeted social benefit system, much of it resulted from a jump in oil and gas revenues over the years (PIDE ECO, 2018).

[76]In Azerbaijan, public investment expanded continuously mainly reflecting higher investment in the non-oil economy, much of which was supported by government development program. However this process of economic diversification in the country from oil to non-oil sector is also largely based on its oil exports through which such government projects are funded and given net exports have shown a downward trend (from 33.6 percent of GDP in 2010 to 17.1 percent in 2014 and further to 3.0 percent in 2015) because of significant increase in imports and decrease in the value of oil exports hence these factors again may limit the process (PIDE ECO, 2018).

persisted between 2005 to 2014[77] turned into deficit (-0.4 percent of GDP) post drastic decrease in energy prices in 2015 and export earnings dropped in the aftermath of the oil price shock. Consequently, the central bank was forced to devalue the manta with further loss in foreign exchange reserves[78]. Dependence on oil sector alone despite having strong position in terms of foreign reserves reveals prime vulnerability within Azerbaijan that needs corrective action. In this regard agriculture though small (accounts for 7 percent of GDP)[79] is an important component of Azerbaijan's non-oil economy and has significant potential for boosting export revenues for the country along with becoming active source of rural livelihood and means of securing domestic food supply.

As part of diversification policy that is being implemented in Azerbaijan over last few years to reduce dependence of economy on oil and achieve economic development of rural areas, many policy steps have been initiated. One such measure that has been successfully implemented is agrarian reform since 1995 that has resulted in an effective role of the market, allowed proper utilization of land and property and brought improvement in overall structure of the agrarian sector through ensuring secure property rights on agricultural land, more inclusive distribution of agricultural farms, and adequate provision of technology and equipment. This policy shift towards agricultural development

[77] In 2006, when BTC pipeline became functional, there was a sudden jump in current account surplus because of oil revenues (PIDE ECO, 2018).

[78] Gross international reserves fell by USD 15.6 billion in 2014 to USD 7.9 billion in 2015 (PIDE ECO, 2018).

[79] Agriculture is the third largest productive sector in the economy after oil and construction in terms of value of output, but it accounts for the largest share of employment (in 2006, 39.1 percent of total employed population was working in agriculture, and only 1 percent in the oil sector). Consequently, the performance of the agriculture sector is key to poverty reduction in rural areas

has shown improved performance over the years[80], however key challenges still remain in the areas of productivity improvement, access to latest technology, increasing area under cultivation especially in mountains, provision of high quality seeds, and improving access to water. Proper coordination of policies pertaining to production and processing of crops and public investments in agricultural sector are expected to lift agricultural productivity thereby improving food production.

[80] Agricultural production is predominantly done by the private sector: the number of agricultural producers is 1,208.7 thousand units, 99.98 percent of which is comprised of private farms. Land areas owned and rented by agricultural producers is 2.3242 thousand hectares (69.3 percent family-villager, 11.4 percent housekeeping, and 2 percent farming). Each agricultural producer has 1.92 hectare of land area on average. About 16.0 percent of farms use mineral fertilizer in cropping while 32.0 percent use organic fertilizer. In comparison with 2005, agricultural production including hunting and forestry increased by 0.9 percent, livestock increased by 2.9 percent, while plant growing declined 0.8 percent due mainly to a reduction in sowing areas (sowing areas of potato decreased 5.4 percent, garden plants 0.5 percent, tea plantations 38.5 percent). Investment in agriculture, hunting and forestry increased 42 percent in comparison with 2005 amounting to 32.3 million AZN (Azerbaijan New Manat). Refer to discussion on state of agriculture in ECO region in chapter 2.

Figure 8.4: Key Macroeconomic Indicators - Azerbaijan

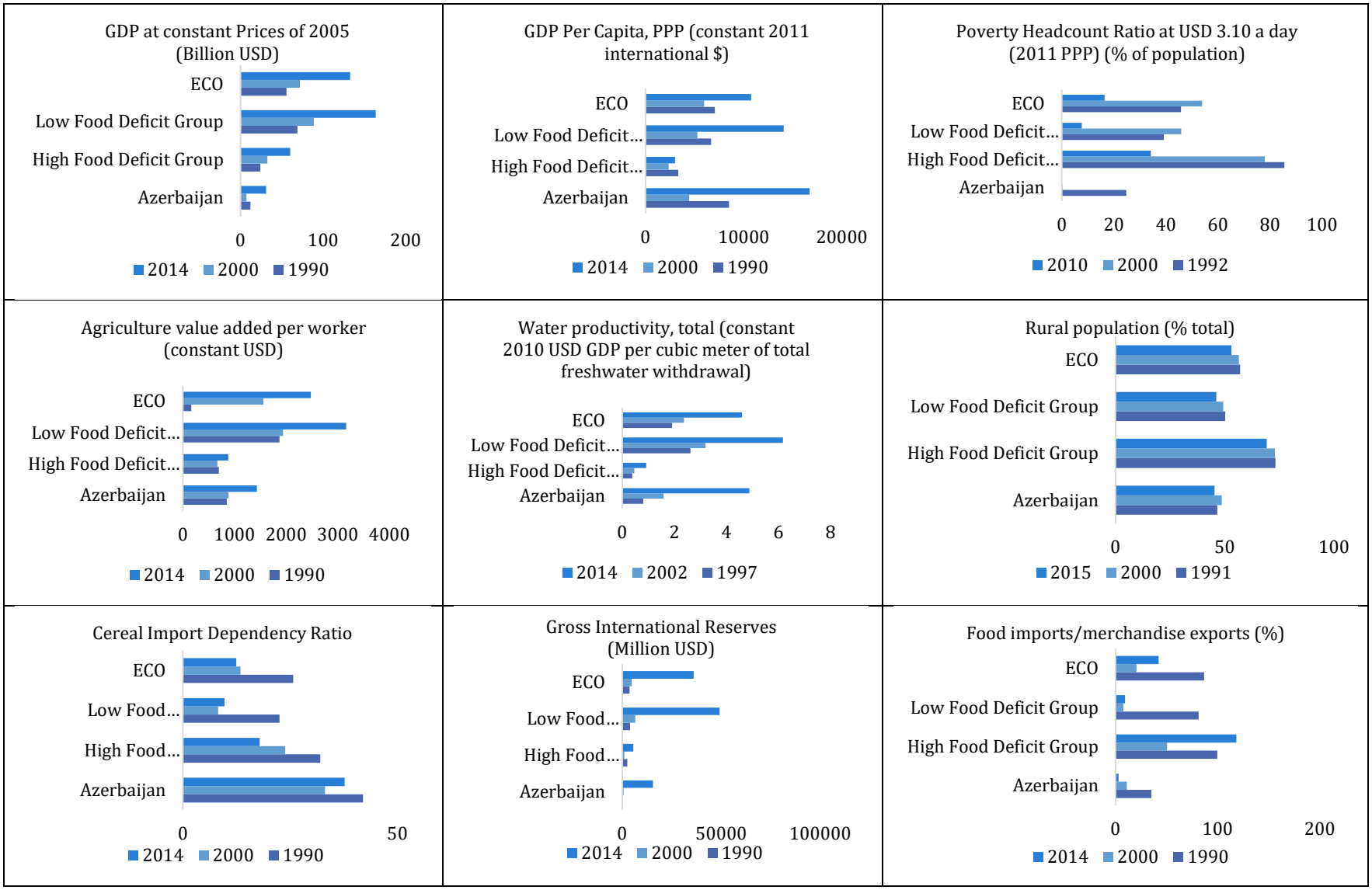
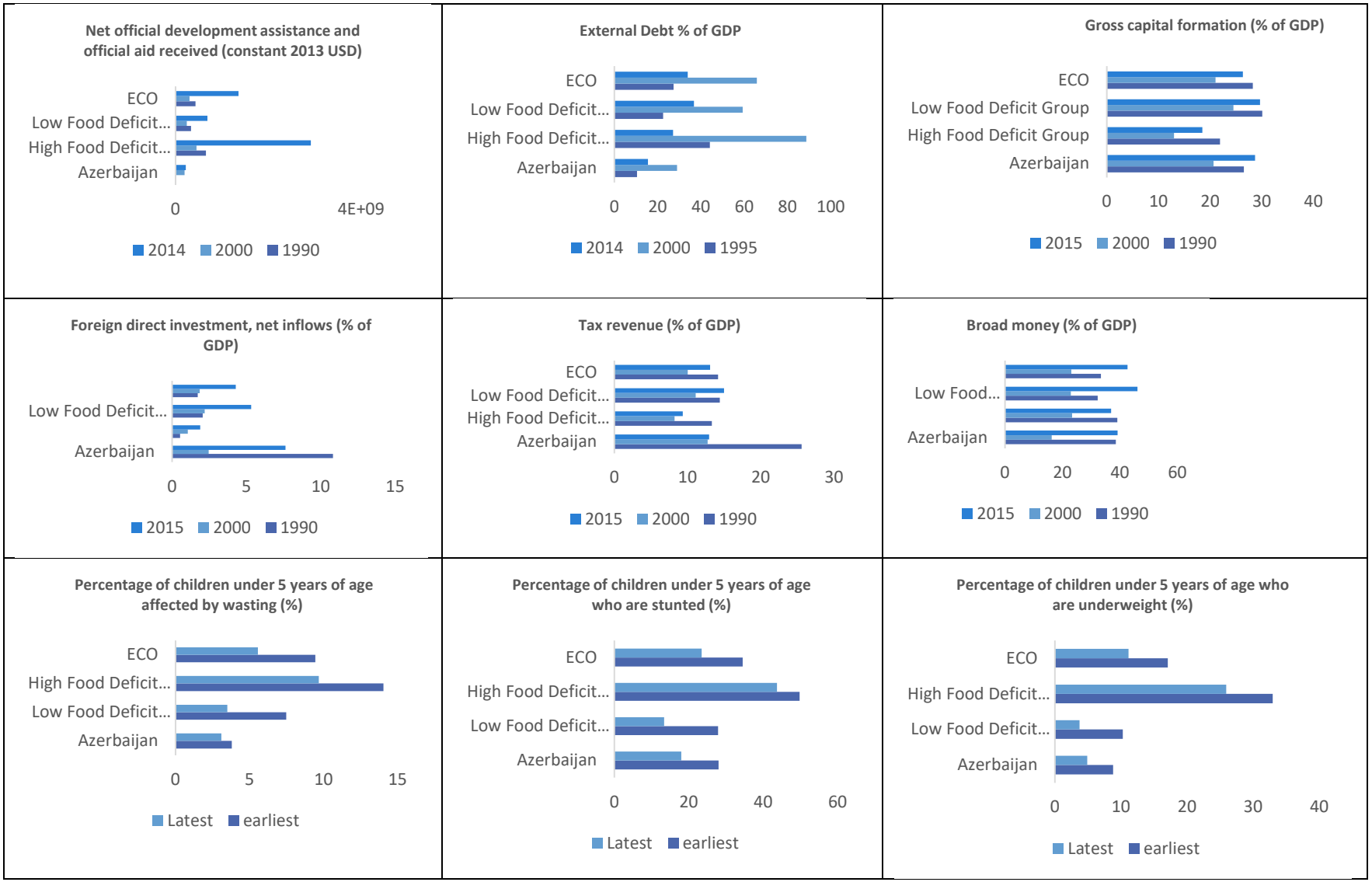


Figure 8.5: Key Macroeconomic Indicators – Azerbaijan (Contd.)



Source: World Bank (2017b)

Figure 8.6: Key Macroeconomic Indicators - Azerbaijan (Contd.)

Source: FAO (2017); World Bank (2017b)

8.3. Iran

Iran started off with a prevalence rate of undernourishment in children of 5.1 in 1990-1992 and has managed to reduce this to less than 5 in 2014-2016; the benchmark to meet MDG target in 2015. Hence hunger has remained in check within the comparison time line of MDG targets from 1990 to 2015 period. While Iran has succeeded in terms of limiting undernourishment prevalence rate to less than 5 percent target, it has also done well in terms of chronic indicators of undernourishment in children under age 5 with declining trend for children with wasted, stunted and underweight growth. However, obesity is an emerging concern as can be seen from patterns in figure 9 below. A number of factors have helped Iran in the process of hunger reduction.

Firstly, Iran comes out among countries with most prominent agricultural performance with third position in terms of agricultural value added per worker in the region standing right after Turkey (at first position) and Kazakhstan (at second position) (figure 11). This is owing to a resilient agricultural sector that has played an important role in strengthening food security whether directly or indirectly through its impact on other sectors of economy.

Agriculture sector plays an important role in Iran's economy contributing about a quarter of national output and employing a third of the labor force. The contribution of agriculture sector to GDP increased from 21.3 percent in 1991 to 24.5 percent in 2002 over the years indicating the increasingly significant role of this sector. There exists considerable potential to increase agricultural output in Iran as currently only about 11

percent of the country's total land area of 163.6 million hectares is cultivated and still 63 percent of the cultivable lands have not been used. Given the fact that 18.5 million hectares of the present farms are being used with 50 to 60 percent utility, and about one-seventh of the total cultivated land is sufficient to meet domestic demand, Iran could emerge as an important supplier of food in the ECO region. In this context it is important to note that though Iran exports about 12 percent of its agricultural output, it continues to face various challenges in international markets especially in export of food items including chicken meat. Researchers have found that domestic chicken meat production has been increasing in Iran but the country's total chicken meat production in the Middle East is not stable due to problems in coordination of production policies and competition in the region's market. Besides, trade and production policies have not been conducive to greater exports as these have not enabled domestic producers to take advantage of the growing Middle East market (Please refer to discussion on state of agriculture in ECO region in chapter 2).

Further it goes without saying that problem of hunger has its roots in poverty for not only hunger has been curtailed in Iran but also poverty levels within MDG comparison time zone 1990 to 2015 (same patterns are observed in Turkey and Kazakhstan) (figure 9). Hence pro-poor nature of growth that is evident in Iran is possibly the most important element in controlling hunger issues[81].

[81] Here a notable program of health services covered by state insurance that is being practiced within Iran for some time needs to be mentioned which is aimed to protect poor from health-related shocks by reducing their out of pocket expenditures on health to negligible levels, however efficacy of program is debatable (http://www.who.int/countries/irn/en/).

Secondly though Iran is second most populated country in ECO region with its population standing at 79.1 million as per 2015 estimates, it has kept its population growth in check at the rate of 1.2 percent per annum emphasizing once again how demographics dynamics have been so important for sustainability of developmental goals within ECO region.

Besides all above factor Iran (like Turkey and Kazakhstan) has shown extremely stable macroeconomic indicators. This stability is reflected in terms of favorable socioeconomic indicators such as poverty levels and income generation mechanism (both at level and in per capita terms) as compared with regional mean values[82] as well as in the form of its much higher financial sector development, very low external debt burden and its position as second largest contributor from ECO region in international trade in terms of its shares of export and import in world (first being Turkey and third being Kazakhstan).

Finally, Iran's economy is characterized by a large hydrocarbon sector, small scale agriculture and services sectors, and a noticeable state presence in manufacturing and financial services. Iran ranks second in the world in natural gas reserves and fourth in proven crude oil reserves. Economic activity and government revenues still depend to a large extent on oil revenues and therefore remain volatile. Iran has highest level of foreign

[82] Iran has been documented with much lower levels of poverty than the regional average along with being the second highest contributor to income generation within the region (20.2 percent) but also as being third highest in terms of per capita income (USD 3,541) in the region.

reserves in the region[83] , affording the government significant leverage to protect their population from price shocks but also from other adverse conditions. More specifically, from the international food price shocks of 2007-08 and 2010-11 despite a cereal import dependency, and also withstand economic sanctions for some years.

Due to its isolation from global financial markets, the 2008 global financial crisis did not affect Iran to the same extent as other, more globally interconnected countries. However, following sanctions related to Iran's nuclear program, the Iranian growth fell to a record low in 2012, thus debilitating overall economy. However, since then after the political change in 2013, the Iranian economy has changed mechanisms and has moved from the recessionary years in which it experienced a -6.6 percent decline in 2012, and -1.9 percent in 2013 into growth years whereby in 2014 all the three sectors of the economy on supply side recorded growth; maximum growth of 4.9 percent being in industry and growth of 4.3 percent was documented in 2015. Furthermore, the lifting of sanctions, ability to export more oil and petroleum products coupled with the recent unfreezing of assets in international banks will also help sustain this growth path in future despite the negative impact emanating from lower oil prices since 2014-15. However high unemployment (particularly among youth and women) remains a serious concern[84]; it is highest in the region.

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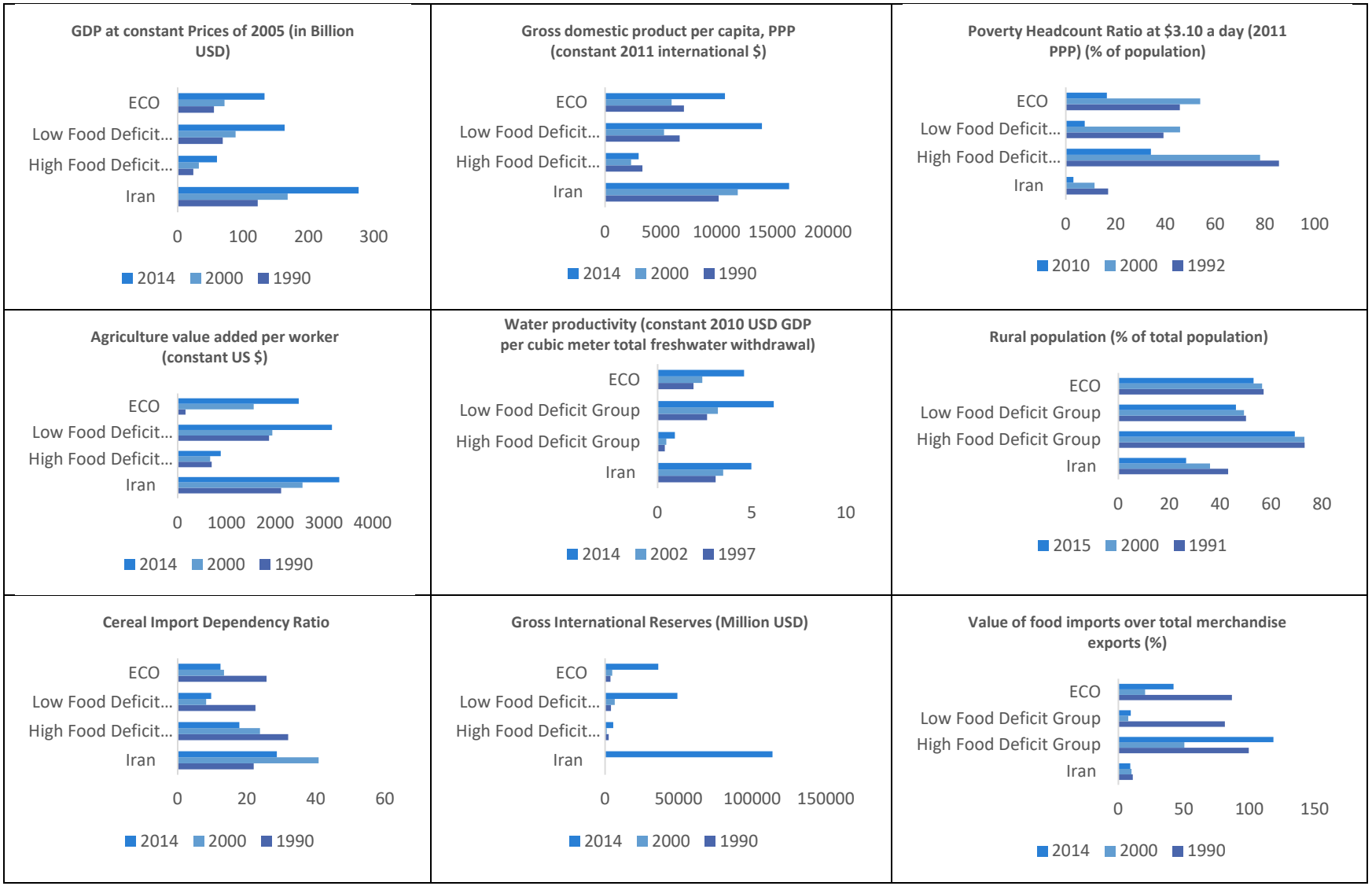
[83] As per 2015 estimates Iran is at the top with foreign reserves of USD 122.6 billion, followed by Turkey with reserves of USD 110.5 billion within ECO region (PIDE ECO, 2018).

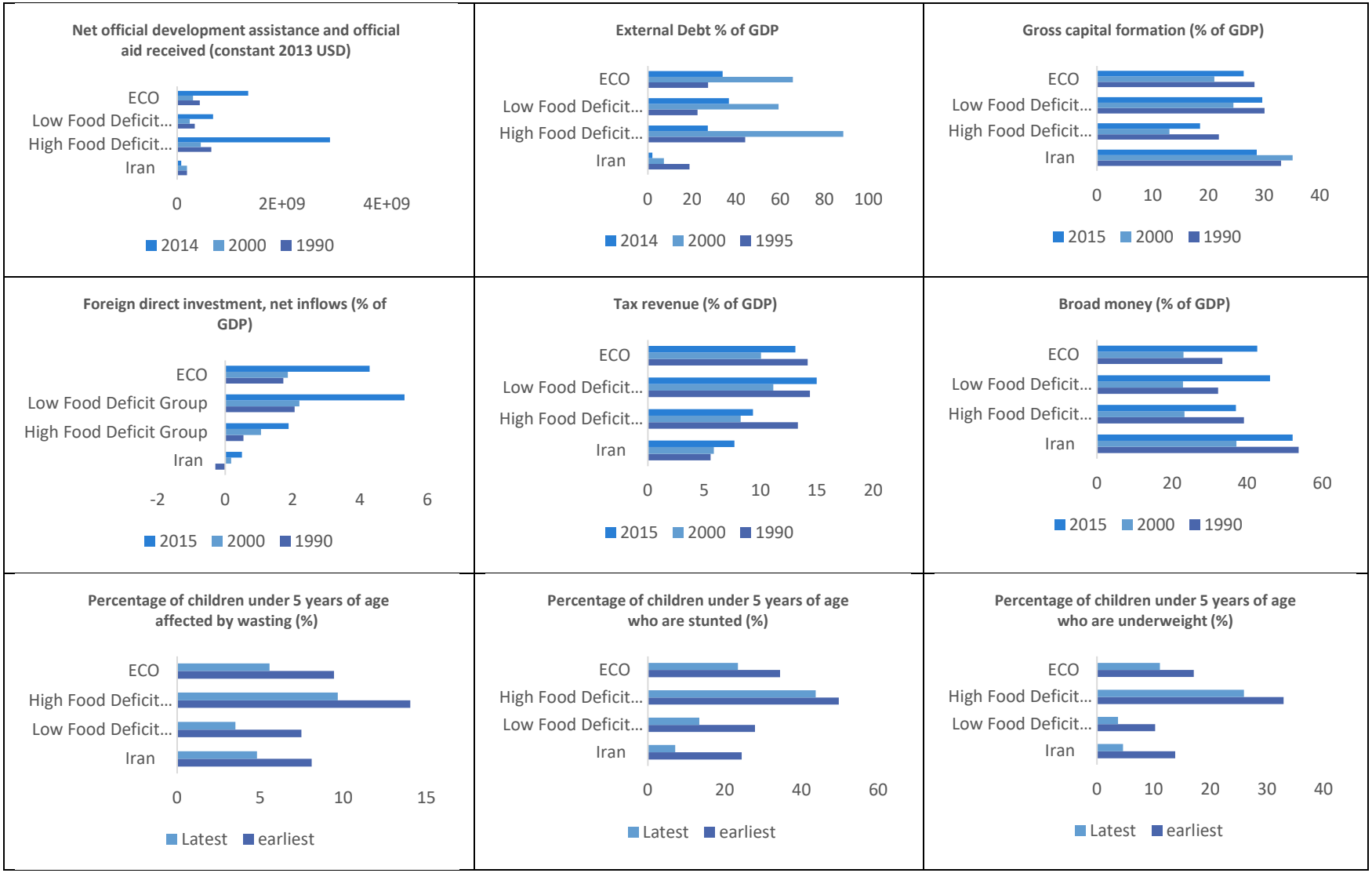
[84] Inflation, output gap, economic uncertainty associated with an unstable currency, the real growth of investment, and the aftereffects of Iraqi war, all have limited job opportunities, particularly for the rising number of youth population in Iran. Economic sanctions in 2012 further added to its labor market problems (PIDE ECO, 2018).

Figure 8.7: Key Macroeconomic Indicators - Iran



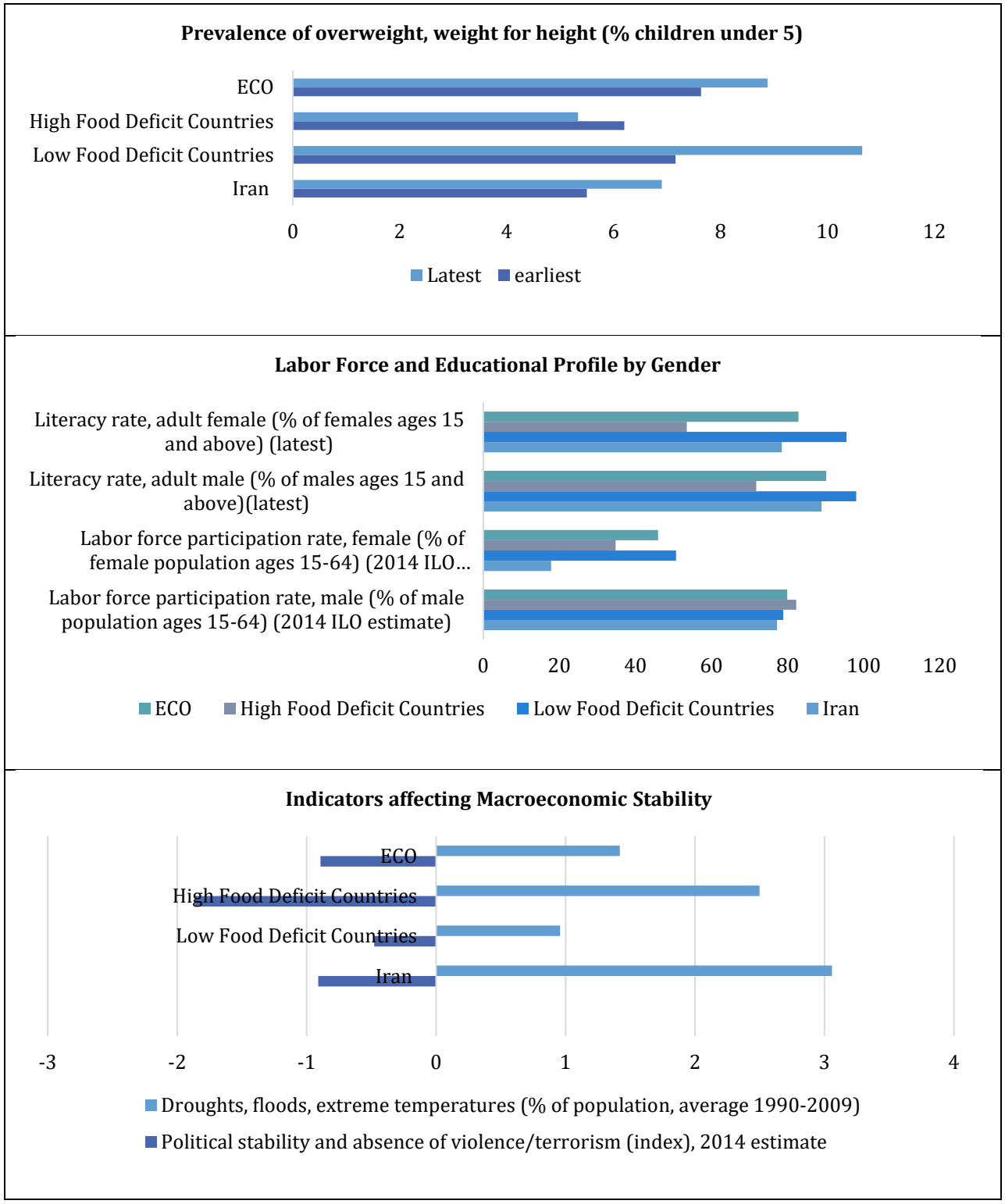
Source: World Bank (2017b)

Figure 8.8: Key Macroeconomic Indicators - Iran (Contd.)



Source: World Bank (2017b)

Figure 8.9: Key Macroeconomic Indicators – Iran (contd.)



Source: FAO (2017); World Bank (2017b)

8.4. Kazakhstan

Kazakhstan, has sustained the level of undernourished below 5 percent since 1990 – 92, fulfilling its MDG hunger requirement throughout the comparison time period. The factors likely responsible for sustaining the process of food security are discussed here.

Kazakhstan implemented policies promoting self-sufficiency in cereal and maintained strong structural factors such as achievement of higher level of development in per capita terms[85], keeping the population size and its growth at sustainable levels[86], holding poverty levels low and promoting high agricultural productivity levels (Figure 5).

Poverty levels have shown a dramatic decline post 2000 which again emphasizes the link across MDG 1A and MDG 1C targets. Kazakhstan has achieved success in hunger elimination and poverty reduction on the back of high level of female empowerment[87], high level of skilled labor force[88], low unemployment rates[89] and a stable political system with very little threat of terrorism (Figure 5).

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[85] Kazakhstan is placed at number two (USD 5,566) within the region, right after Turkey (USD 8,897) in terms of per capita income (PIDE ECO, 2018).

[86] Kazakhstan is a low population country within the region with a population share of only 3.8 percent (17.5 million growing at the rate of 1.5 percent per annum).

[87] It is evident from patterns in figure 18 that not only labor force participation rate and adult literacy levels are quite high for both male and female population (being higher than average estimate for both low and high food deficit ECO region in case of analysis by female population only) but with very little gender differences.

[88] Kazakhstan economy workforce is estimated to be 7.4 million people. The general education and scientific level of the workforce within Kazakhstan is quite high this being reflected in it being ranked as first on UNESCO's "Education for All Development Index" by achieving near-universal levels of primary education, adult literacy, and gender parity in 2011 (ibid).

[89] Unemployment has reduced from 10.4 percent in 2001 to 4.1 percent in 2014.

In addition, Kazakhstan shows much higher agricultural and water productivity than other countries in the region, with the exception of Turkey, ensuring that there are no food supply lapses (Figure 5). The population is very much safe in terms of having safe access to improved water resources and improved sanitation and very high coverage of immunization[90]. Preventive care is very strong which has led to not only keeping undernourishment incidence below 5 percent in its population, but much lower proportion of children suffering from waste, and underweight growth (Figure 5; Chapter 1: Appendix Tables 29a and 31a). However, stunted growth of children and childhood obesity are two areas where evidence of chronic hunger can be observed, and due attention is needed (Figure 5; chapter 1: Appendix Tables 30a and 32a).

While foreign reserves of the country are sizable, they fall below the regional average by 19.1 percent, while the ratio of food imports to total export merchandise is less than the regional average by 90.4 percent in Kazakhstan) with no cereal import dependency. Hence, there is no risk of shock based on global changes in cereal demand while the country can face moderate vulnerabilities with any international food price spike with source of origin other than that of cereal. This can be said against the back drop of Kazakhstan's historically high dependence on oil exports for maintenance of its foreign reserves[91]. Among the shocks that were faced by Kazakhstan economy in the past include

[90] Proportion of people with improved water resources and sanitation facilities has been estimated to 93.2 percent and 97.4 percent respectively along with 99 percent of children (ages 12-23 months) immunized for DPT and measles in 2010 (Chapter 1 Appendix Tables 26 a, 27a, 37a and 37b).

[91] Kazakhstan have oil and gas reserves and its important source of foreign reserves is through oil exports that got a positive push in face of economic reforms and privatization within 1995-1997 and

collapse of demand for Kazakhstan's traditional heavy industry products in the aftermath of the break-up of the USSR in December 1991. This resulted in a short-term contraction of the economy with the steepest annual decline occurring in 1994, and downward turn of Kazakhstan economy in 1998 due to slumping oil prices and the financial crisis in Russia from which it recovered in 1999.

As a result of slower world economy post 2008, economic growth dropped to 1.2 percent in 2009 from an average 10 percent growth for period 2000-07. Kazakhstan recovered from this scenario in 2010 but again in 2015 real GDP growth slowed from 4.3 percent in the previous year to 1.2 percent due to falling oil prices and weakened domestic and external demand resulting in tremendous decline in net exports given the fall in global oil prices[92]. In face of these fluctuations within Kazakhstan economy, due to changing global environment especially in context of oil demand, the government has gradually started reformation of its industrial policy to diversify away from over dependence on the oil sector by developing light industry. Within this initiative, Kazakhstan became the 162nd member of WTO in 2015 and is expected to benefit from liberalization.

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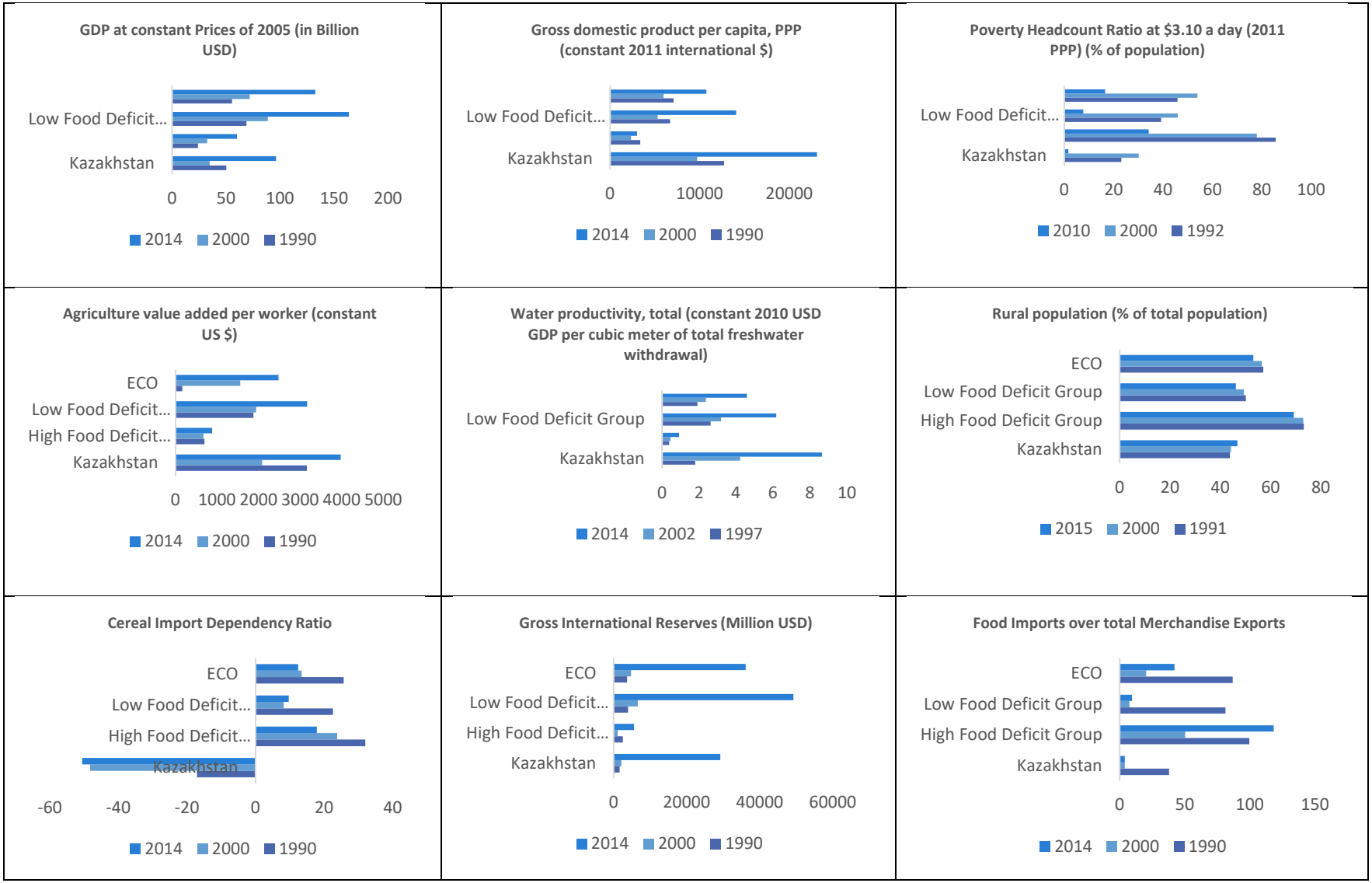
emergence of Caspian Pipeline Consortium agreement to build a new pipeline from Western Kazakhstan's Tengiz oil field to Black Sea thereafter (PIDE ECO, 2018).

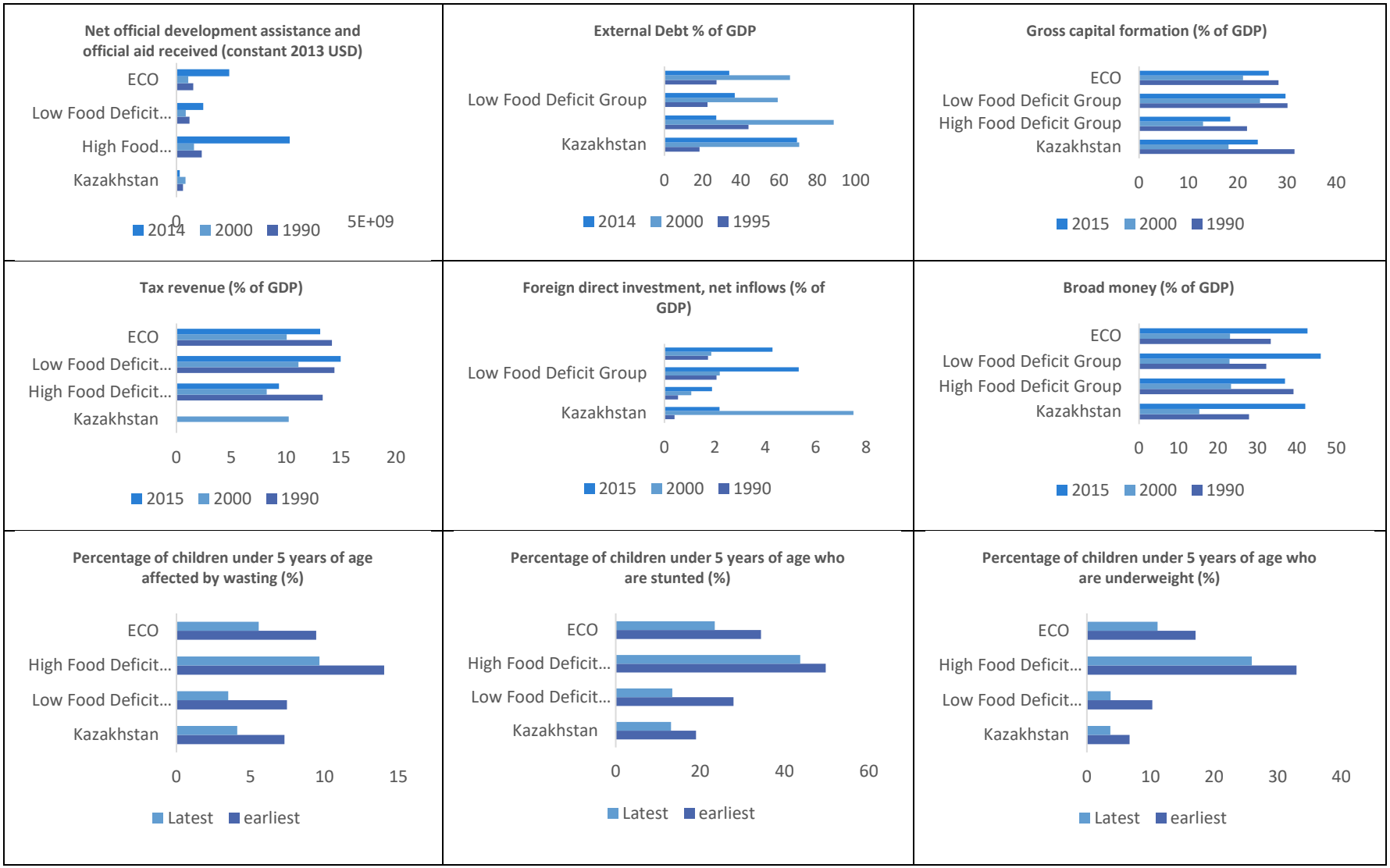
[92] On the supply side, agriculture grew by 4.1 percent in 2015, industry recorded a negative growth of 0.3 percent and services grew by 2.4 percent within Kazakhstan (PIDE ECO, 2018).

Figure 8.10: Key Macroeconomic Indicators - Kazakhstan



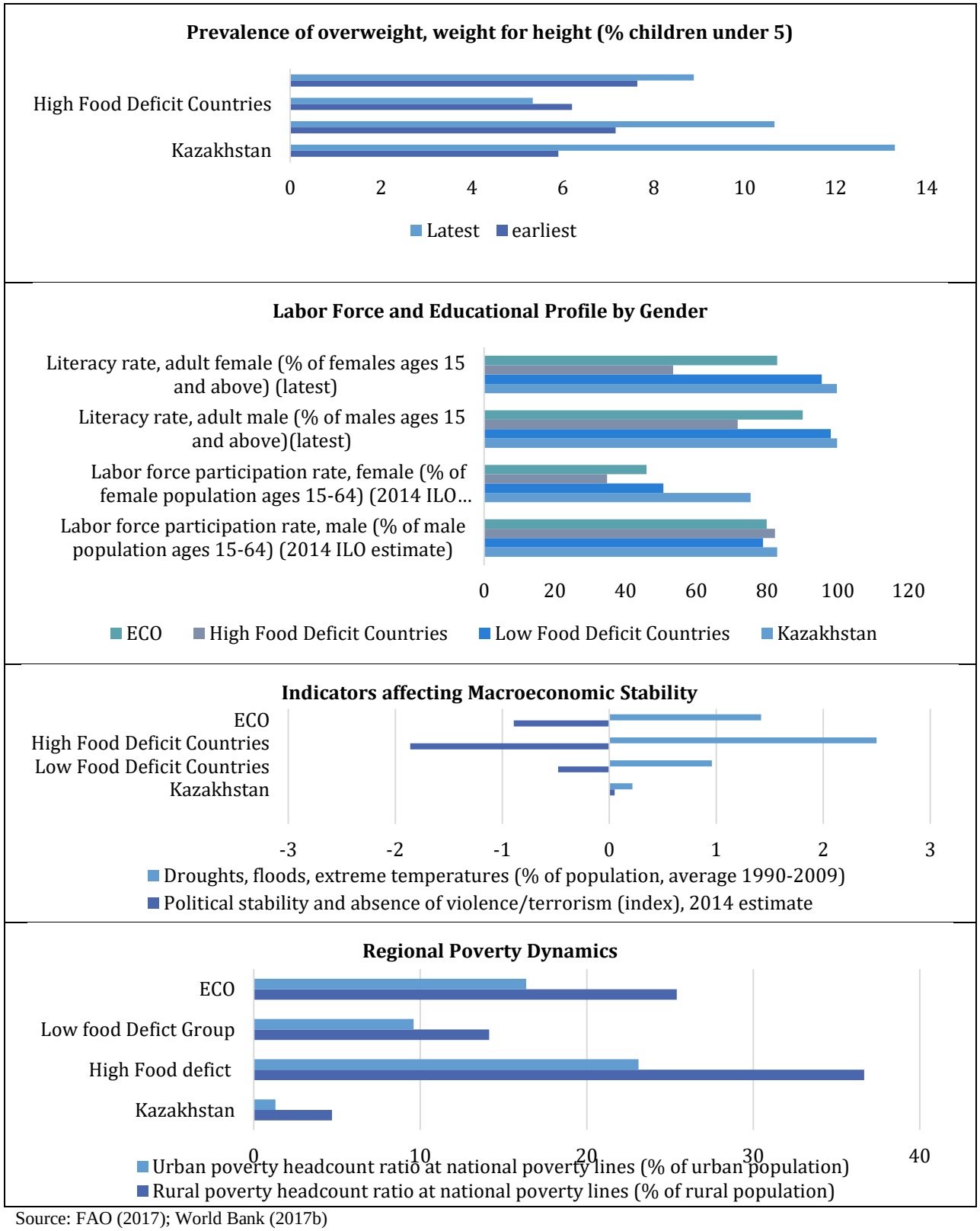
Source: FAO (2017); World Bank (2017b)

Figure 8.11: Key Macroeconomic Indicators - Kazakhstan (Contd.)



Source: Source: FAO (2017); World Bank (2017b)

Figure 8.12: Key Macroeconomic Indicators - Kazakhstan (contd.)



Source: FAO (2017); World Bank (2017b)

8.5. Kyrgyzstan

Kyrgyzstan is the only country in the ECO region where there seems no one to one mapping between hunger reduction and poverty reduction: despite high levels of poverty, the prevalence rate of hunger has been curtailed to half in 2015[93]. Not only prevalence rate of undernourishment has been effectively handled in Kyrgyzstan, but it has shown promising progress in terms of chronic indicators (Figure 10). Hence the immediate policy question that comes out is how we place experience of Kyrgyzstan in context of MDG 1a and 1c hunger goals that establish link across process of hunger reduction with that of poverty reduction.

A deeper look into this issue shows that while process of pro-poor growth helped in reducing undernourishment in Kyrgyzstan, poverty levels as of recent available information are still quite high but between 2000-2010 time period there is evidence of reduction in extreme poverty at rate of 71.3 percent and it was through this process of reduction that undernourished population size was brought within MDG decided range. This pattern again endorses the link across MDG 1a and 1c hunger goals. However important thing to note is that though both indicators: proportion of people under extreme poverty threshold and proportion of undernourished people from total population show a decreasing trend within Kyrgyzstan post 2000, yet rate of decrease is much more in former

[93] In terms of GDP level, Kyrgyzstan is at much lower level than regional mean value for low food deficit group and had almost 20 percent population below USD 3.10 poverty line and 2.91 percent in case extreme poverty threshold (according to recent available information on poverty levels). This is high by international standards, and matches the figures for countries in the high food deficit group, such as Tajikistan.

than latter (Chapter 1 Appendix Table 1.19). Further if we compare this pattern across other countries, we find this to be true for all ECO countries (except Iran) irrespective of whether they succeed in reducing incidence of hunger to MDG requirement or not. This points towards a pressing need for a nutrition sensitive food policy along with poverty reduction programs that have health and nutrition focus so that link across MDG 1a and 1c, i.e. how reduction in extreme poverty helps in curtailing incidence of hunger, can be further strengthened.

Furthermore, despite pro-poor nature of growth that has helped in controlling undernourishment somewhat over time in Kyrgyzstan yet there remain vulnerabilities at many levels. Firstly, Kyrgyzstan is a country that is not only dependent on global markets for cereal requirement but has very low level of foreign reserves accumulation along with slightly raised food import to total export merchandise ratio in comparison to other ECO countries. Despite Kyrgyzstan being a low food deficit country remains at extreme risk to international food price shock from fluctuation in international staple and/or non-staple food demand or oil price shocks from changes in global markets. This extreme vulnerability to external shocks is exacerbated not only by having highest ratio of total external debt to total GDP in the region (97.2 percent), but also due to prolonged period of negative growth[94]. In terms of structural constraints, Kyrgyzstan remains at lower level of

[94] The economy depends heavily on gold exports and remittances from Kyrgyzstani migrant workers, primarily in Russia due to which in terms of growth, real GDP moderated in 2014 (declined from 10.5 percent in 2013 to 3.6 in 2014 and then to 3.5 in 2015) as a result of weak external demand (basically prolonged economic slowdown in Russia) and lower production at Kumtor Gold mine. Decline in gold production affected the overall performance of exports. Moreover, adverse weather pushed down agricultural yields in

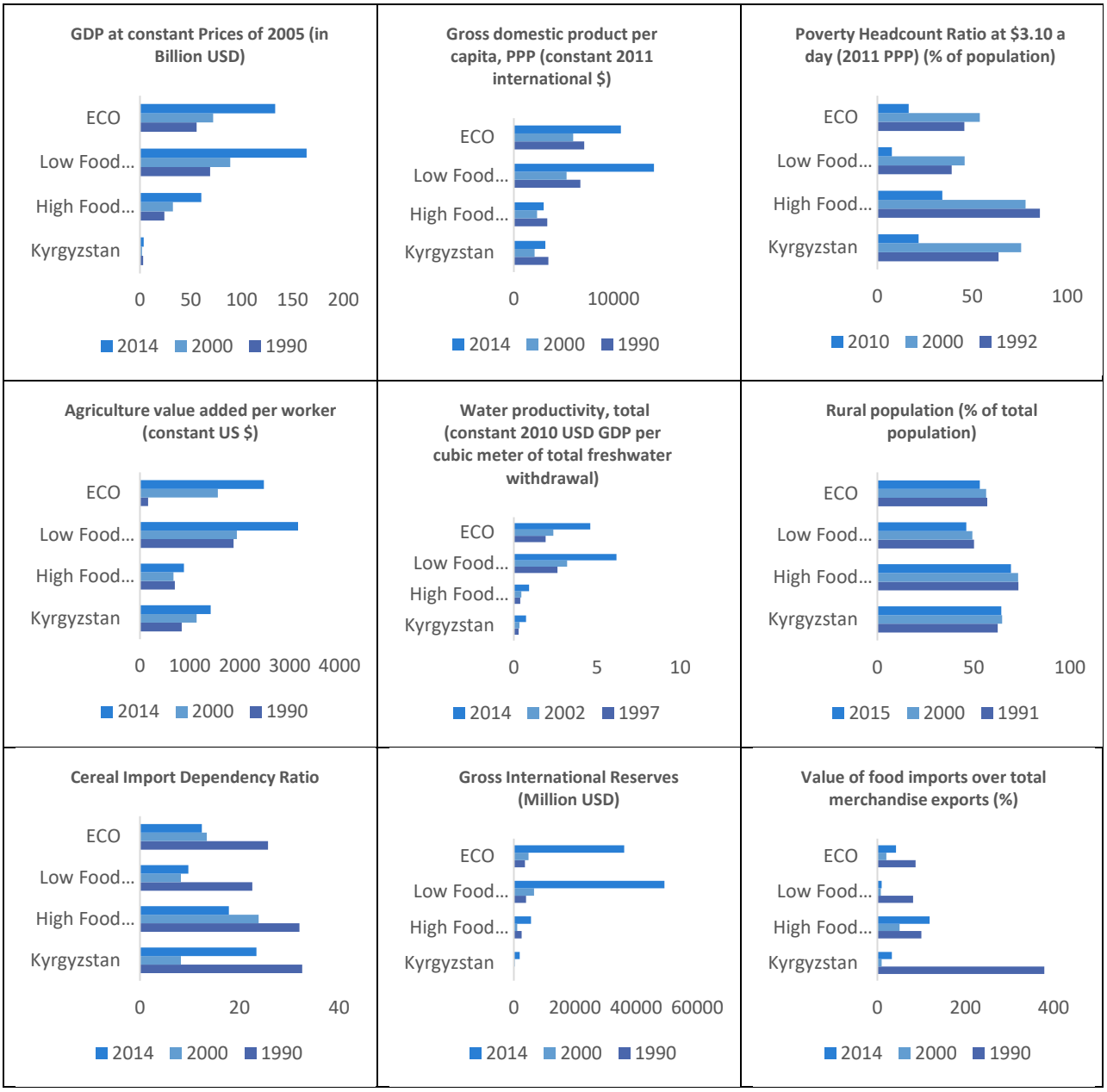
development within the low food deficit zone. This is evident from much lower GDP level both in level and per capita terms[95] as well other macroeconomic indicator including high poverty levels.

On the macroeconomic front, both final consumption expenditure (private consumption) and gross capital formation increased over the years but at the cost of external imbalances. A sharp increasing trend for share of imports over the years along with declining trend in exports due to drop in the production of gold and weaker sales of fruits, vegetables and textiles resulting in net exports declining from -30.1 percent of GDP in 2010 to -50.2 percent in 2015 (PIDE ECO, 2018). The current account deficit (percent of GDP) exhibited an increasing trend since 2010 amounting to 17 percent of GDP in 2015, resulting in a continuous depreciation of the domestic currency against USD since 2009 and a drop in gross international reserves from USD 2.2 billion in 2013 to USD 1.8 billion in 2015. Finally, although its economy and society are the most liberal in Central Asia, the Kyrgyz Republic has experienced significant political and social instability since independence in 1991 and is found to be quite vulnerable to climatic shocks (please refer to figures below). On a positive note, Kyrgyzstan's smaller population size and slower population growth rates have enabled it to cope with adverse shocks emphasizing the importance of demographic factors in food security issues.

2014. In 2015, besides external factors slowdown in industry was responsible for further deceleration by 0.1 percent in 2015.

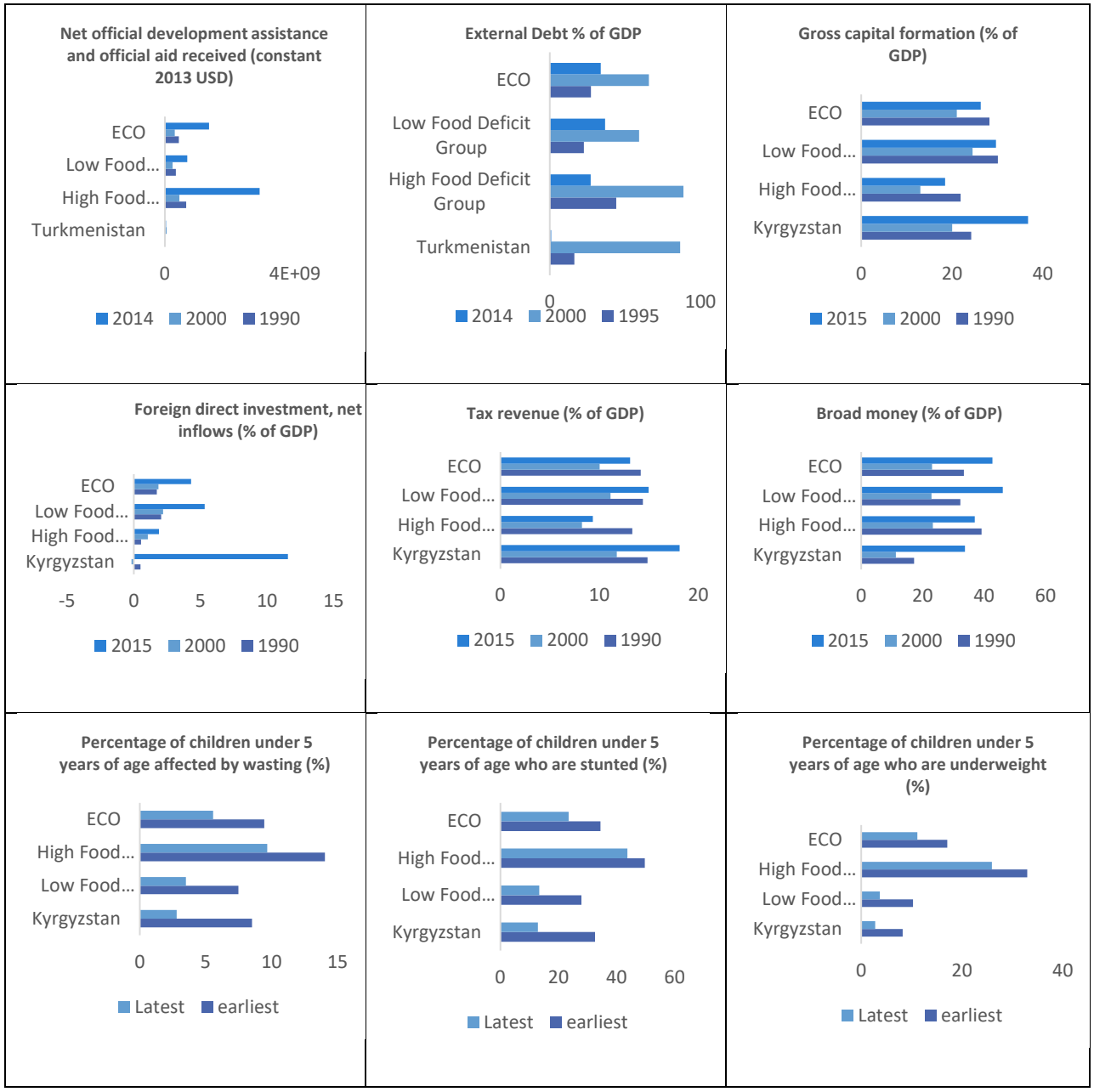
[95] Kyrgyzstan is not only one of Central Asia's poorest countries but also lowest in the ECO region with lowest share of only 0.28 percent in region's GDP (PIDE ECO, 2018).

Figure 8.13: Key Macroeconomic Indicators - Kyrgyzstan



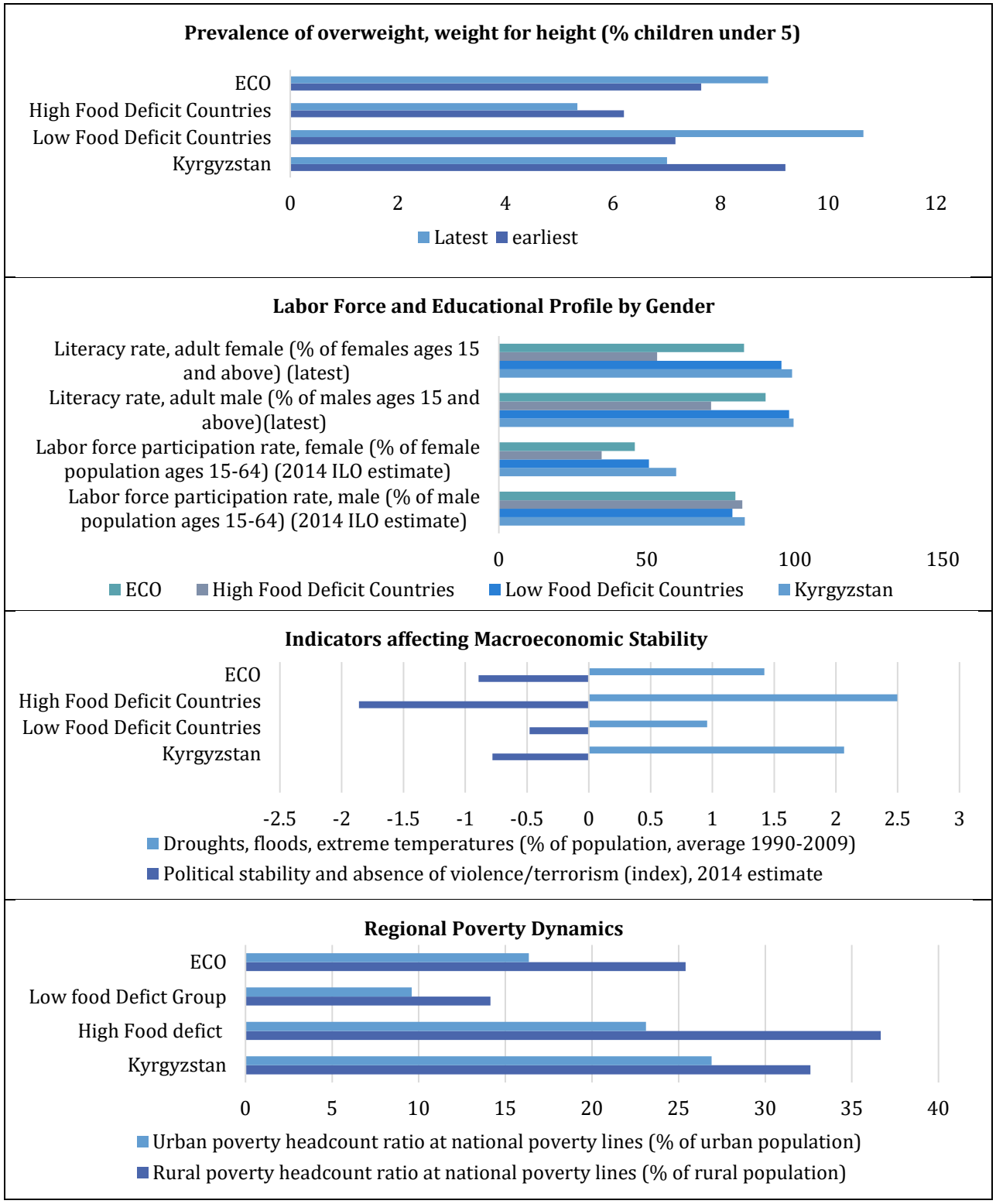
Source: FAO (2017); World Bank (2017b)

Figure 8.14: Key Macroeconomic Indicators - Kyrgyzstan (Contd.)



Source: FAO (2017); World Bank (2017b)

Figure 8.15: Key Macroeconomic Indicators - Kyrgyzstan (Contd.)



Source: FAO (2017); World Bank (2017b)

8.6. Pakistan

Pakistan has not met MDG target of reducing prevalence rate of undernourished to half by 2015 from baseline value in 1990-92 whereas the size of undernourished population has increased by 44.2 percent across years 1990 and 2015 (that is negative performance in terms of WFS hunger target). Moreover, Pakistan has largest population of undernourished population within ECO region with its size standing at 41.4 million. Some of the factors that are restricting Pakistan's efforts in achieving the MDG and WFS targets are discussed below.

Pakistan is a country with a huge agricultural potential. However, in recent years Pakistan's agricultural growth has slowed down which has adversely impacted the food security situation. Part of the reason is that Pakistan is predominantly an agriculture dependent country with huge population base that is largely placed in rural sector (Figure 1). Furthermore, not only poverty remains significant concern within Pakistan both in rural and urban areas, but it has its locus in rural side of the economy (ibid). Slower agricultural growth since 2000 has weakened the rural sector with adverse consequences for the rest of the economy both directly and through inter-sectoral growth impact.

The crucial role of agriculture in Pakistan's economy is evident not only from the fact that it accommodates almost half of the country's labor force but also accounts for over a third of Pakistan's total export earnings (Spielman *et al.*, 2016, chap. 1). Further among the most important crops grown within Pakistan are cotton, wheat, rice and maize which directly and indirectly provide a base for industrial growth to take place (directly in case of

textile industry by providing input - cotton and indirectly in case of textile and other industries by not only securing food base of the country's labor force but also through providing a substantial impetus for export earnings) (PIDE ECO, 2018).

Moreover, population growth remains a problem for Pakistan. With a population size of 188.9 million growing at the rate of 2.1 percent per annum[96] , there is continual problem of sustaining such enormous population size that is increasing over time. With GDP growth rate on lower side, and agricultural performance also below its potential post 2000 along with weak macroeconomic indicators such as lower levels of FDI, high level of external debt to GDP ratio, high fiscal deficits[97], high dependence on official aid and political instability to name a few (Figure 1), these factors taken together are responsible for sluggish performance in poverty eradication and hunger elimination efforts within Pakistan.

Pakistan's economy grew strongly at about 6 percent by 2007 but thereafter economic growth fell sharply due to the global financial crisis, hike in global oil and food prices and domestic energy crisis. Slow growth from 2008 to 2013 reflected weak macroeconomic fundamentals in recent years. Investment remained low as energy

[96] In terms of population, Pakistan is the largest country (188.9 million growing at the rate of 2.1 percent per annum), followed by Iran (79.1 million growing at the rate of 1.2 percent per annum) and Turkey (78.7 million growing at the rate of 1.5 percent).

[97] Pakistan recorded a highest fiscal deficit in the ECO region as of 2015 estimates (-5.3 percent of GDP). Over the years maximum fiscal deficit in Pakistan was recorded in 2012 (8.8 percent of GDP) and 2013 (8.0 percent of GDP), not only because of low tax revenues but also higher current expenditures on power subsidies, pensions, interest on short-term domestic borrowing. Since 2014, the narrowing down in budget deficit reflects growth in non-tax revenue (increased form 12.8 percent in 2012 to 14.4 percent in 2015).

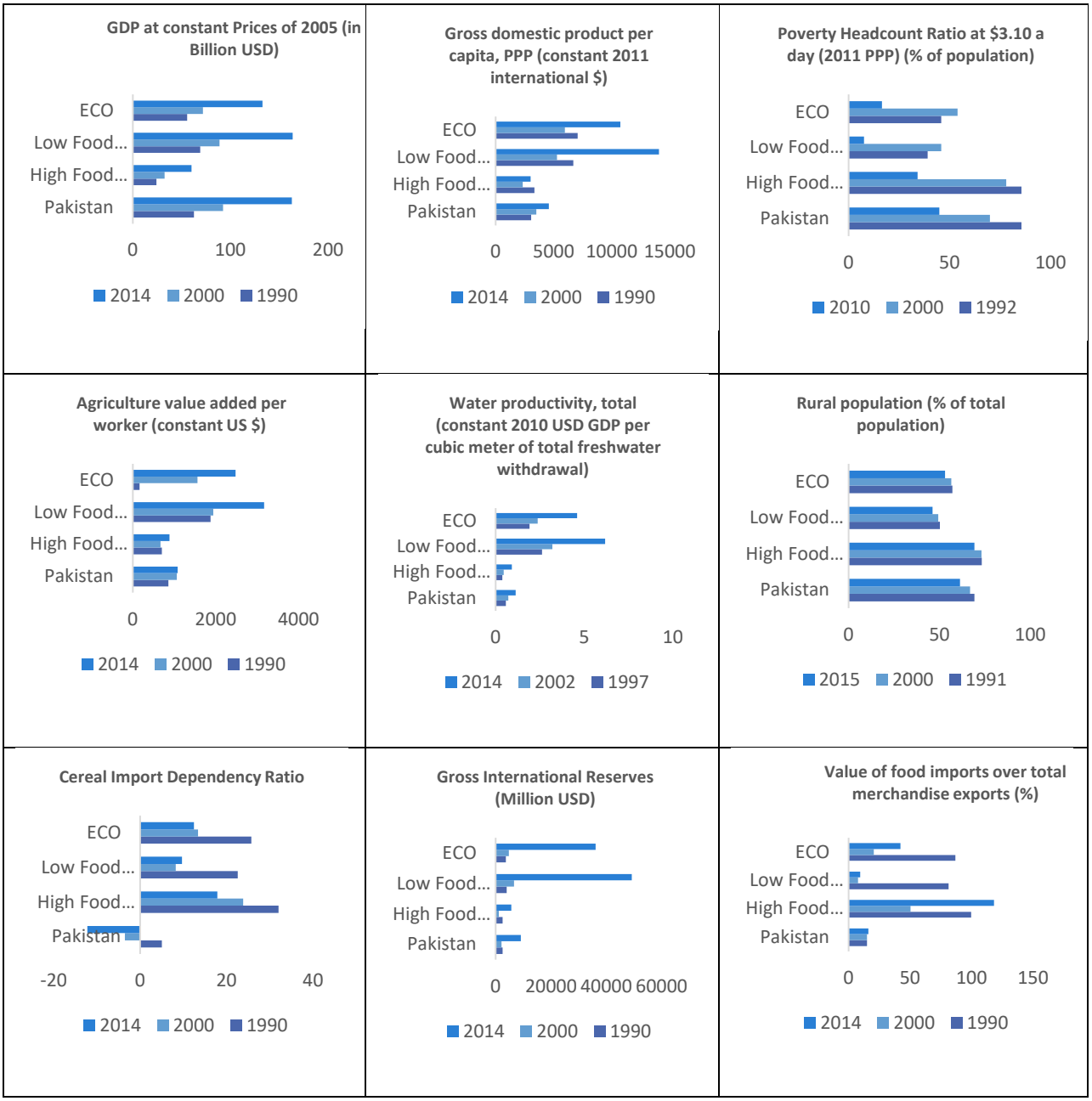
shortages and security concerns continued to undermine investor confidence. Energy shortages also affected industrial sector quite badly. Growth accelerated in Pakistan from 2012 onwards as a result of cumulative impact of the government's macroeconomic and structural reform program. Besides real GDP growth of 5.5 percent in 2015 was supported by fall in commodity and fuel prices, increased energy availability and improved security conditions. On the supply side all sectors contributed to it, agriculture grew by 2.9 percent, industry by 3.6 percent and services by 5 percent (PIDE ECO, 2018)

Further evidence in terms of how food security has been affected in face of macroeconomic and agricultural slowdown of Pakistani economy that has been most obvious post 2000 can be clearly found in patterns of how Pakistani economy has responded to international price shocks of 2007-08 and 2010-11. Looking at how food price index and its rate of change has evolved over time in Pakistan there is clear evidence of increase in food price both in terms of level and inflation rate at the time of shocks. Pakistan being self-sufficient in cereal needs post 2000 with strong negative value for cereal import dependency as of 2014 estimates is protected somewhat from international price shocks. However, given the fact that foreign reserves for Pakistan are much lower than ECO regional mean, the economy remains vulnerable to food price shocks, as evident during last two shocks (figure 14), or to shocks arising out of other changes in international environment like global financial crisis, hike on global oil prices etc.[98]

[98] Forecasted food prices have shown a downward trend post 2015 for Pakistan possibly reflecting the impact of decrease in global fuel price in 2014-15 given it is among those ECO countries that rely on oil imports.

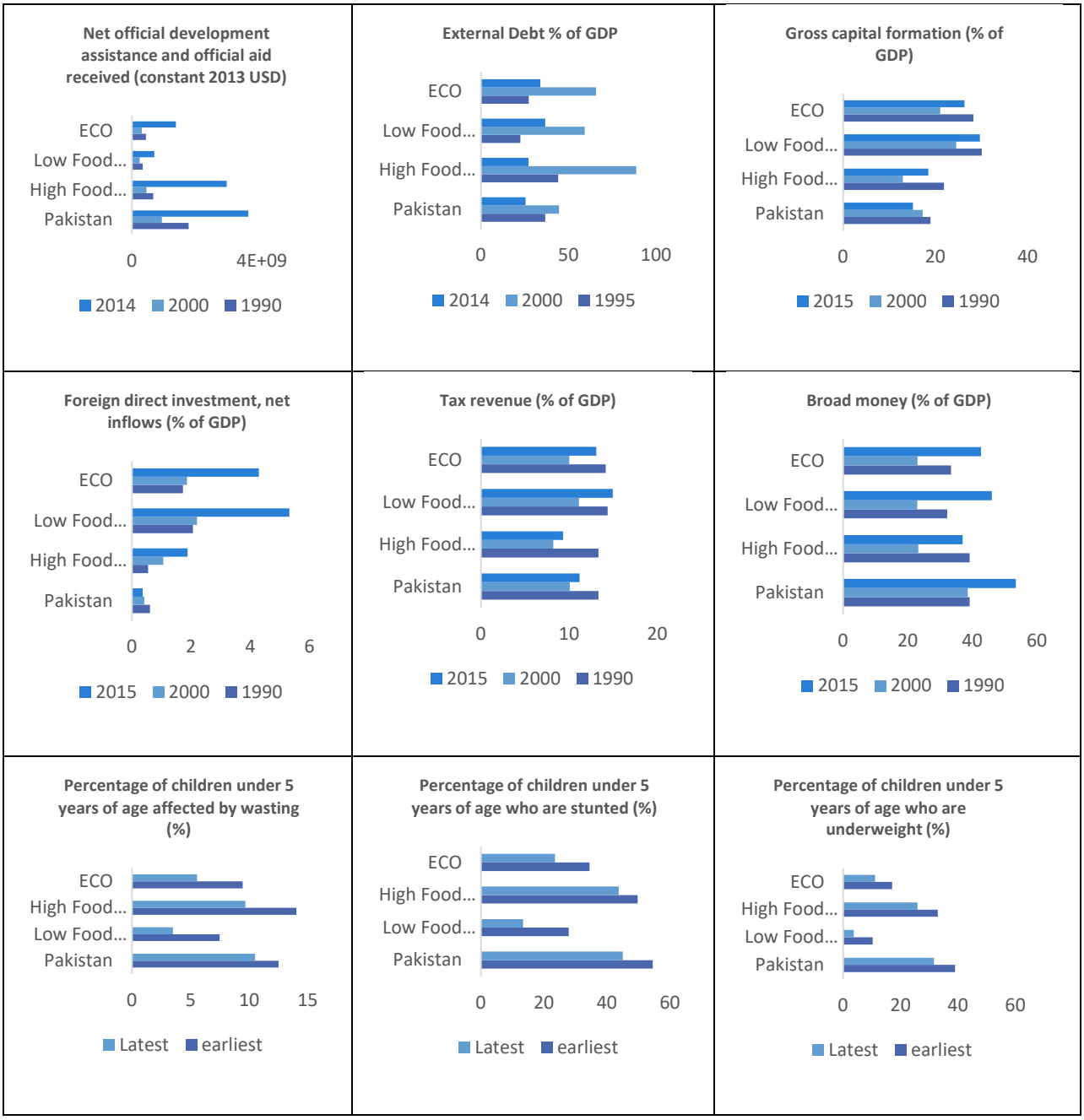
Finally, an analysis of poverty levels, GDP growth levels and Average Dietary Energy Supply Adequacy (ADES) clearly reveals that food insecurity is more a problem of lack of access within Pakistan. Moreover, this problem is not restricted to hunger only but is also apparent in form of chronic indicators of undernourishment such as stunted growth in children, low weight for height in children and percentage of children under 5 affected by wasting (figure 4). Hence tackling hunger and undernourishment should be one of the prime policy concerns in Pakistan.

Figure 8.16: Key Macroeconomic Indicators - Pakistan



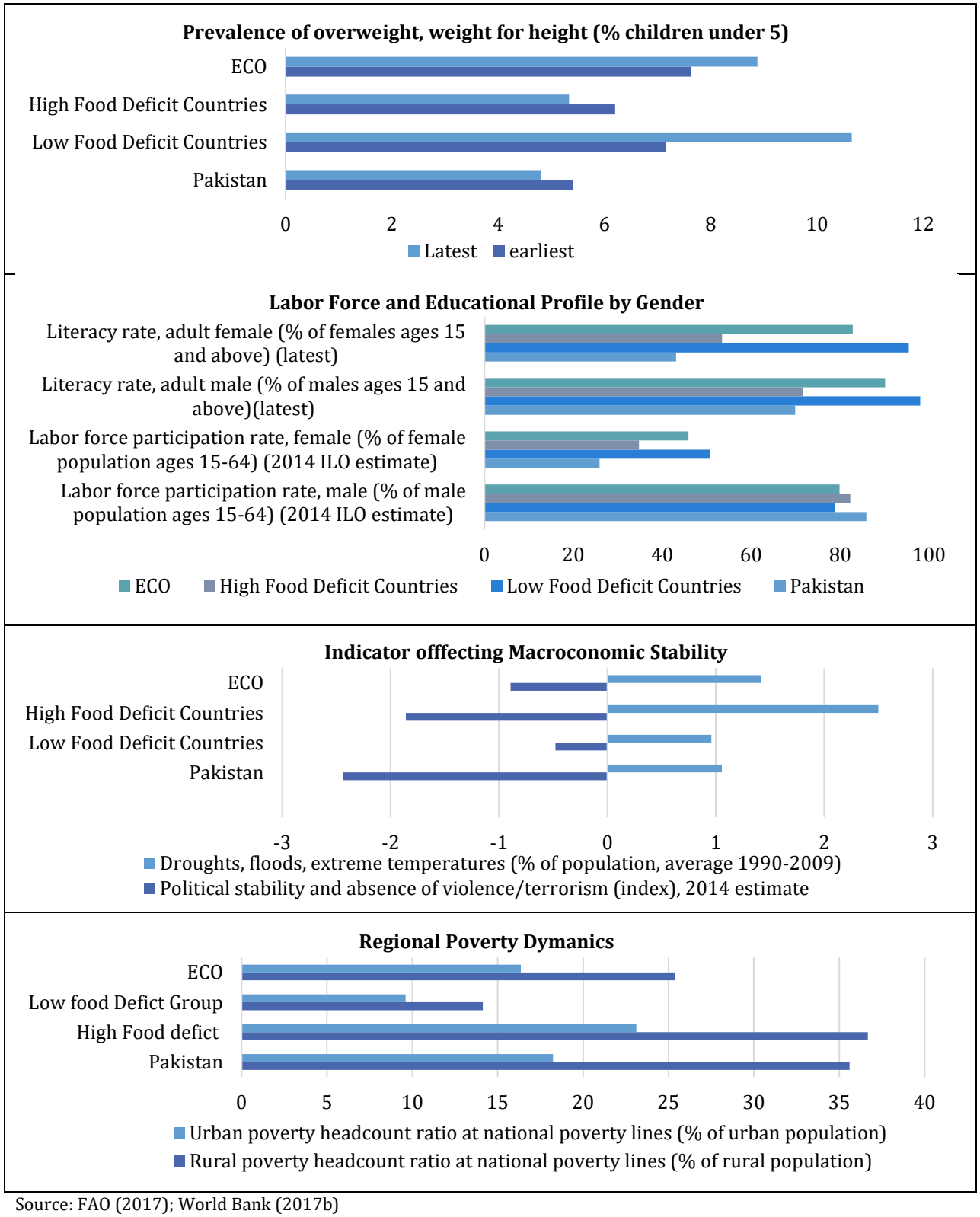
Source: FAO (2017); World Bank (2017b)

Figure 8.17: Key Macroeconomic Indicators - Pakistan (Contd.)



Source: FAO (2017); World Bank (2017b)

Figure 8.18: Key Macroeconomic Indicators - Pakistan (Contd.)



Source: FAO (2017); World Bank (2017b)

8.7. Tajikistan

Tajikistan is in the high food deficit zone of ECO region, and it is the only Central Asian country in the region that could not meet the MDG target of cutting the undernourishment prevalence rate to half by 2015. Tajikistan reported a high prevalence rate of undernourishment of 33.2 percent in 2014 – 2016 which shows an 18 percent increase from 1990-1992 base period. Hence Tajikistan with a size of 2.9 million undernourished population is facing significant hunger risks with heightened vulnerability to international price shocks as evident in lower foreign reserves and relatively higher ratio of food imports to total export merchandize than the regional ECO mean value. Further, relatively higher levels of poverty, lower GDP values and lower agricultural productivity than that of other low food deficit ECO countries along with high proportion of children under age 5 with stunted growth, low weight for height and with wasting in weight reveal inherent structural weaknesses that have kept Tajikistan from achieving food security (figure 16).

In terms of economic growth Tajikistan's economy has been robust since the end of its civil war in 1997, on the back of post-conflict recovery, significant increases in remittance inflows, and a favorable external environment largely brought about by economic development in the Russian Federation[99]. Tajikistan's economy from 1997 to

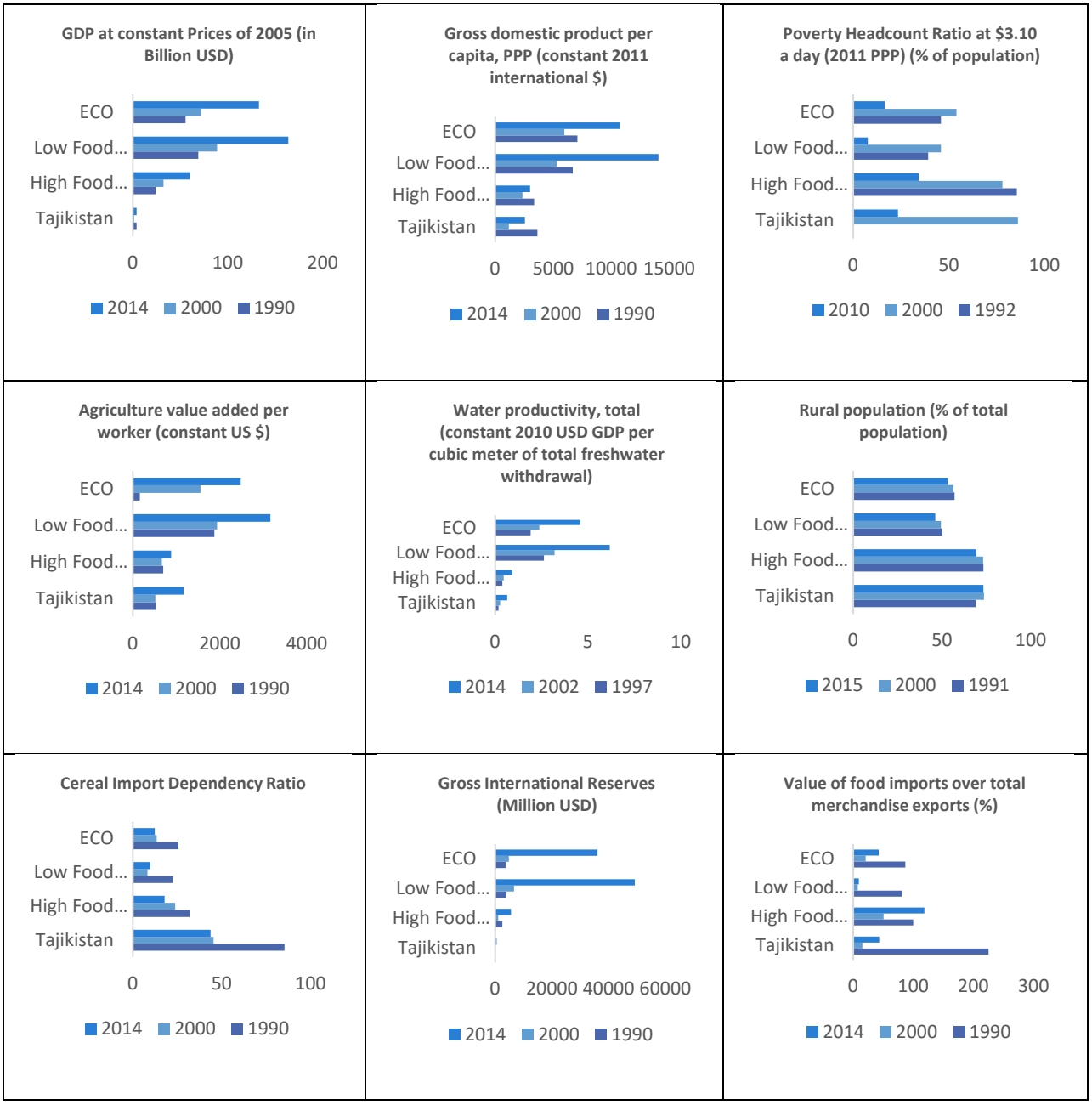
[99] The 5-year civil war severely damaged infrastructure, disrupted industrial and agricultural production, and caused near-total economic collapse. The government initiated various economic and political reforms to restore macroeconomic stability. Tajikistan's economic transition from a centrally planned system toward a more market-oriented system only began around 1997; most of the subsequent period is basically a recovery from war (PIDE ECO, 2018).

2004 grew by an average of 8 percent supported by broad-based growth across sectors. From 2005 to 2014, growth averaged 7 percent, though volatility in the international prices of Tajikistan's two main exports, cotton and aluminum, showed the country's vulnerability to the impulses of commodity prices[100]. From 2005 onwards, workers' remittances started flowing in increasingly significant volumes. This made Tajikistan the world's most remittance-dependent economy. In 2015, decline in remittances (due to the economic slowdown in Russia) and weak global demand for cotton[101] and aluminum slowed down Tajikistan's GDP growth (ibid).

[100] The global economic crisis in 2009 was one such external demand shock. Tajikistan's economic growth decelerated to 4 percent with sharp decline in prices of cotton and aluminum and deterioration of trade. With better macroeconomic management, the country's GDP growth recovered (PIDE ECO, 2018).

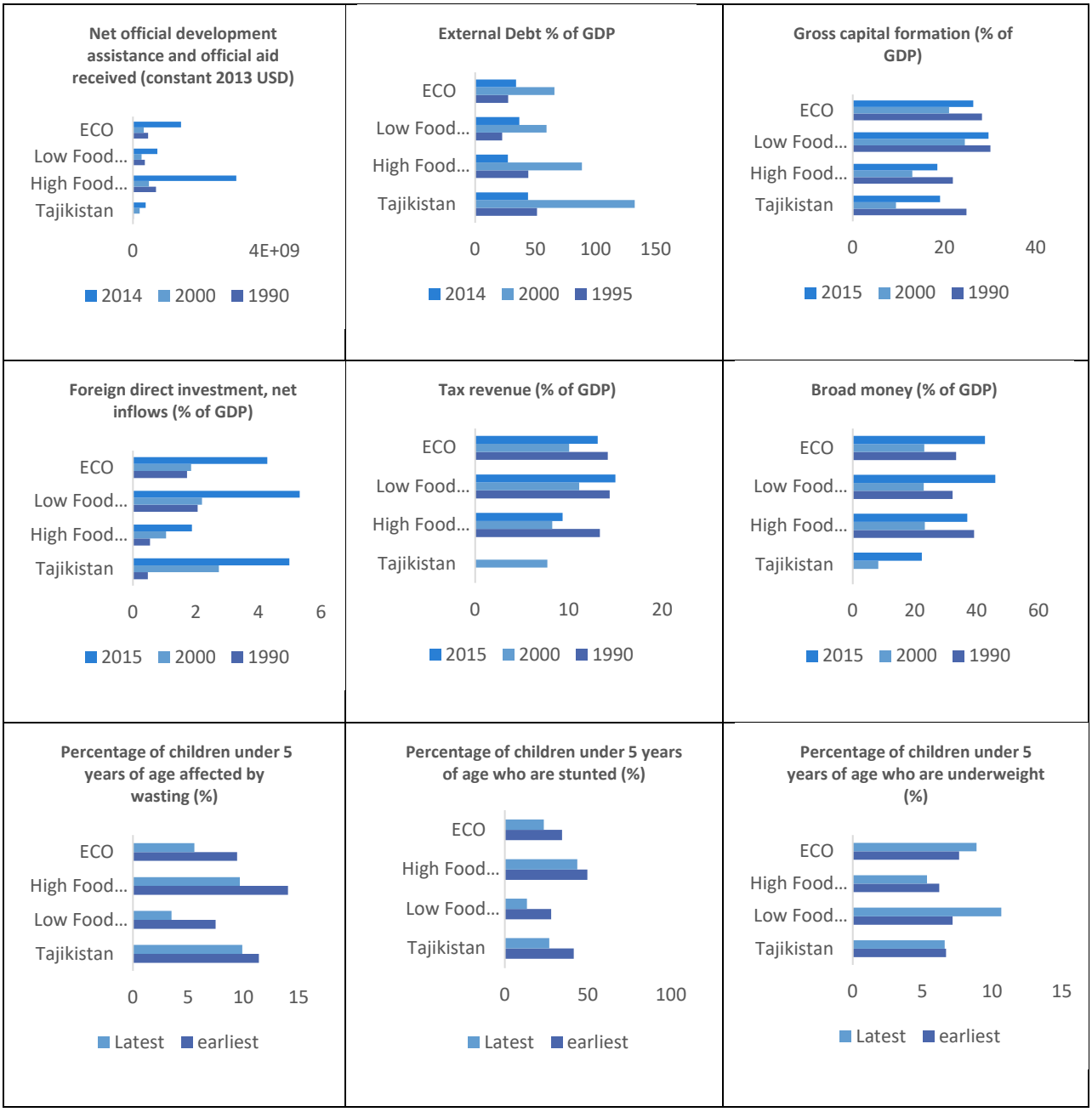
[101] Cotton accounts for 60 percent of agricultural output, supporting 75 percent of the rural population, and using percent of irrigated arable land within Tajikistan (PIDE ECO, 2018).

Figure 8.19: Key Macroeconomic Indicators - Tajikistan



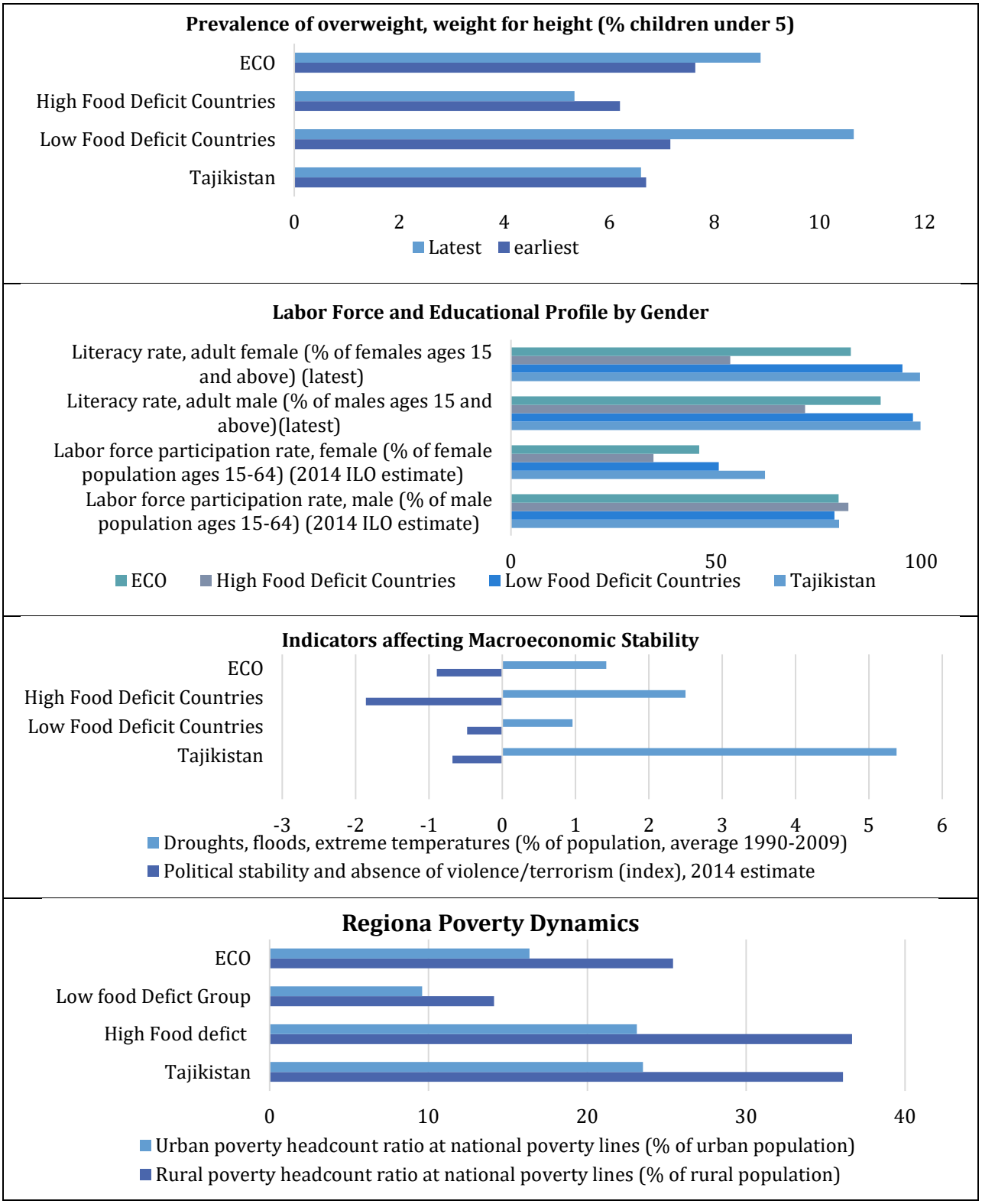
Source: FAO (2017); World Bank (2017b)

Figure 8.20: Key Macroeconomic Indicators – Tajikistan (Contd.)



Source: FAO (2017); World Bank (2017b)

Figure 8.21: Key Macroeconomic Indicators - Tajikistan (Contd.)



Source: FAO (2017); World Bank (2017b)

8.8. Turkey

Turkey is the most food secure ECO country[102] with a robust macroeconomic environment and strong agricultural base. The country leads in terms of its income accounting for more than half of ECO region's income (51.1 percent) and a per capita income at USD 8,897[103]. The performance of Turkey is reflected in patterns of incomes and its growth overtime and a stable macroeconomic situation in terms of fiscal, trade and monetary indicators, and inflow of foreign direct investments along with high agricultural productivity (Figure 4). Turkey's economy has some notable strong points that bear mentioning.

Resilience of agricultural sector performance is evident in Turkey from much higher level of agricultural value added per worker, higher water productivity than regional mean value, and a diversified agricultural base that is catering to all sorts of staple and non-staple food production[104]. Further Turkey is the only ECO country that has trade surplus in most of food products including cereal, fruits and vegetable and animal protein products like meat and fish[105]. Within the ECO region, Turkey is the only country that can perhaps cater to increasing global demand for animal protein, and fruits and vegetables (high value

[102] Turkey is one of those low food deficit ECO country that has maintained level of undernourished below 5 percent since 1990-92.

[103] The countries that stand at second and third highest positions in terms of ranking by per capita income are Kazakhstan (USD 5,566; 2015 estimates) and Iran (USD 3,541; 2014 estimates) respectively

[104] The agriculture sector in Turkey is ranked 7th in the world in terms of production volume. The strengths of the sector include the size of domestic market, a dynamic private sector economy, and availability of water (Please refer to Chapter 2).

[105] Turkey's major agricultural exports include fruits, nuts and vegetables that account for about 60 percent of total agricultural exports. Other significant exports include grains, pulses, oil seeds, flowers, poultry, milk and dairy products. Despite the overall trade deficit of Turkey, the agricultural trade balance is significantly positive, providing cushion to external accounts (Please refer to Chapter 2).

commodities). Also, Turkey is protected from possibility of international food price shock as can be seen from the fact that food prices and its inflation rate remained unaffected during the shock periods of 2007-08 and 2010-11 with a much higher accumulated stock of foreign reserves from ECO regional mean values for both low and high food deficit zone.

Turkey is leading ECO region in terms of robust agricultural growth and a strong industrial base with industries of mine-metal and chemical, automotive[106], electrical and electronics, textile and clothing and in agriculture[107]. Moreover, macroeconomic stability in Turkey is underpinned by fiscal discipline and the country made significant progress in fiscal management throughout the 2000s, both quantitatively and qualitatively[108]. Turkey's central government ran negligible budget deficit in 2015. From performance of agricultural and industrial sector along with strong patterns of GDP growth and poverty reduction indicators related to financial, trade and fiscal sectors of economy we can conclude that Turkey is most structurally strong economy within the ECO region.

It is important to emphasize that Turkey faces some challenges too. For example, obesity and over-nourishment in children is an emerging concern that needs due attention

[106] Turkey is one of the largest exporters of transport equipment (IDE ECO , 2018).

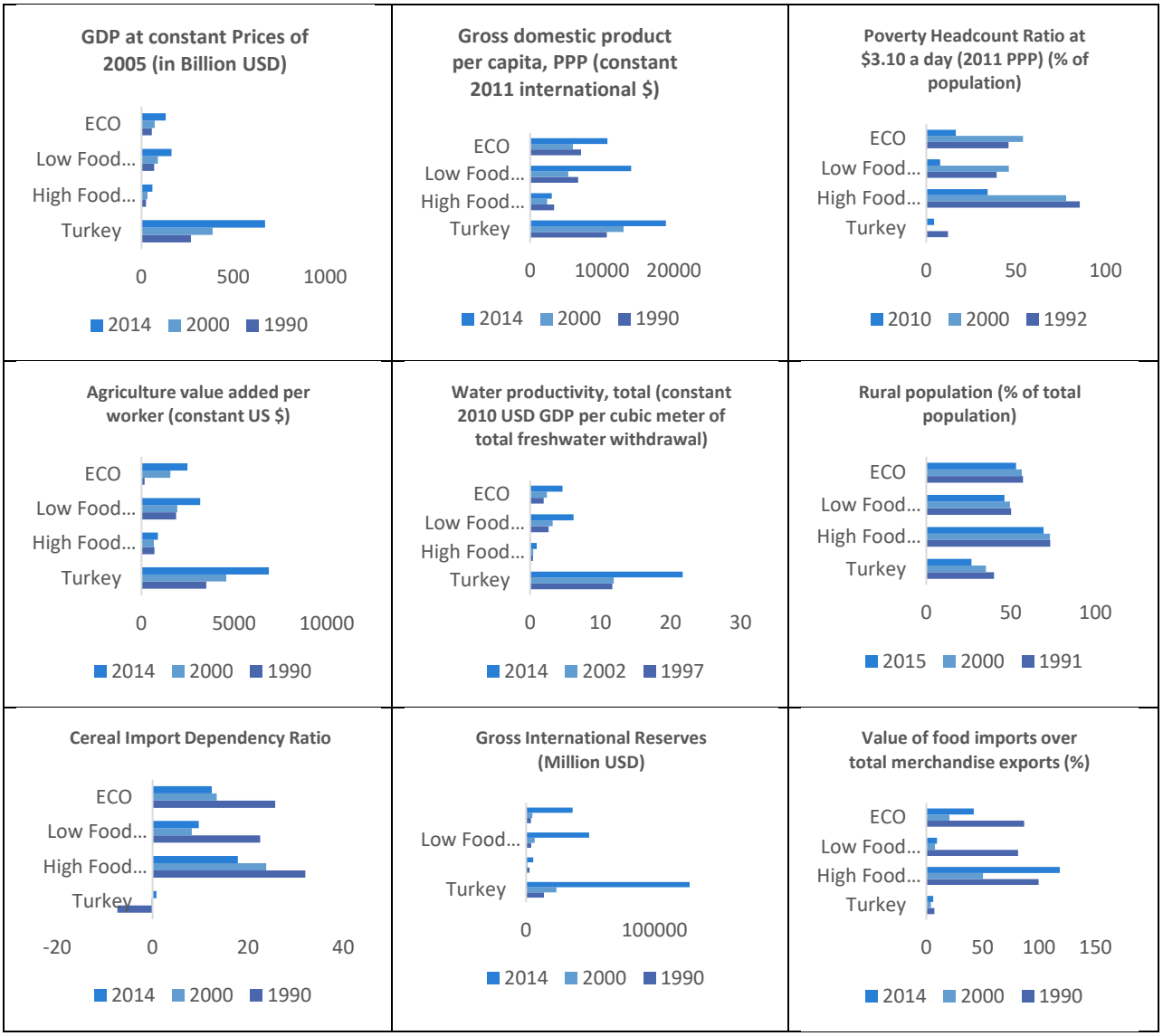
[107]Apart from Turkey, and to some extent Pakistan, the manufacturing sector is not very diversified within the region. The manufacturing sector in other economies is dominated by energy and food industries (PIDE ECO; 2018). After Turkey the two ECO country that have promoted industrial sector greatly are Iran and Pakistan, Iran, besides producing petrochemicals, steel and copper products, has significant automotive industry, and other light engineering sectors, while Pakistan has significant textiles and light engineering sectors (ibid).
2018).

of health care practitioner and policy makers beside youth unemployment[109]. Also, there remains vulnerability to external shocks given that the economy has significant reliance on foreign capital inflows and has run persistently high current account deficit over the years. In this context it is also important to note that Turkey was one of the worst affected countries during the financial crisis[110].

[109] Though Turkey's unemployment rate recovered from the financial crisis, decreased from 12.6 percent in 2009 to 8.1 percent in 2012, but increased again in 2013. Youth represent a particularly vulnerable group in Turkey. Low skills are a key barrier to achieving better labor market outcomes for youth in Turkey (PIDE ECO, 2018).

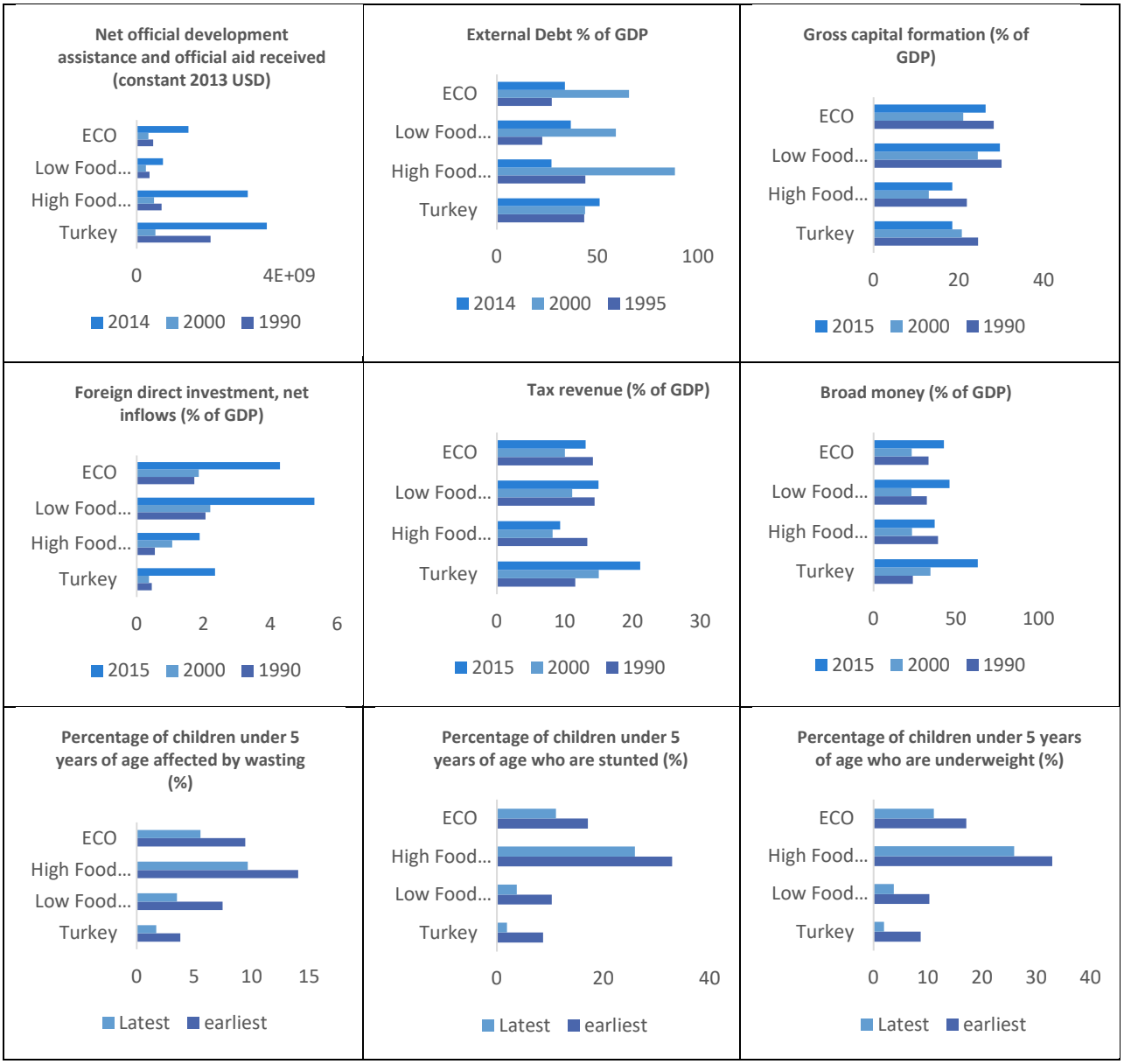
[110] In Turkey, economic growth fell sharply in 2008 to 0.7 percent. In 2009, the economy experienced a sharp contraction in output with negative growth of 4.8 percent as a result of global financial crisis. In 2009, the Turkish government introduced various economic stimulus measures to reduce the impact of the crisis, such as temporary tax cuts on automobiles, home appliances, and housing. As a result, economy grew at 9 percent on average in 2010 and 2011 (PIDE ECO, 2018).

Figure 8.22: Key Macroeconomic Indicators - Turkey



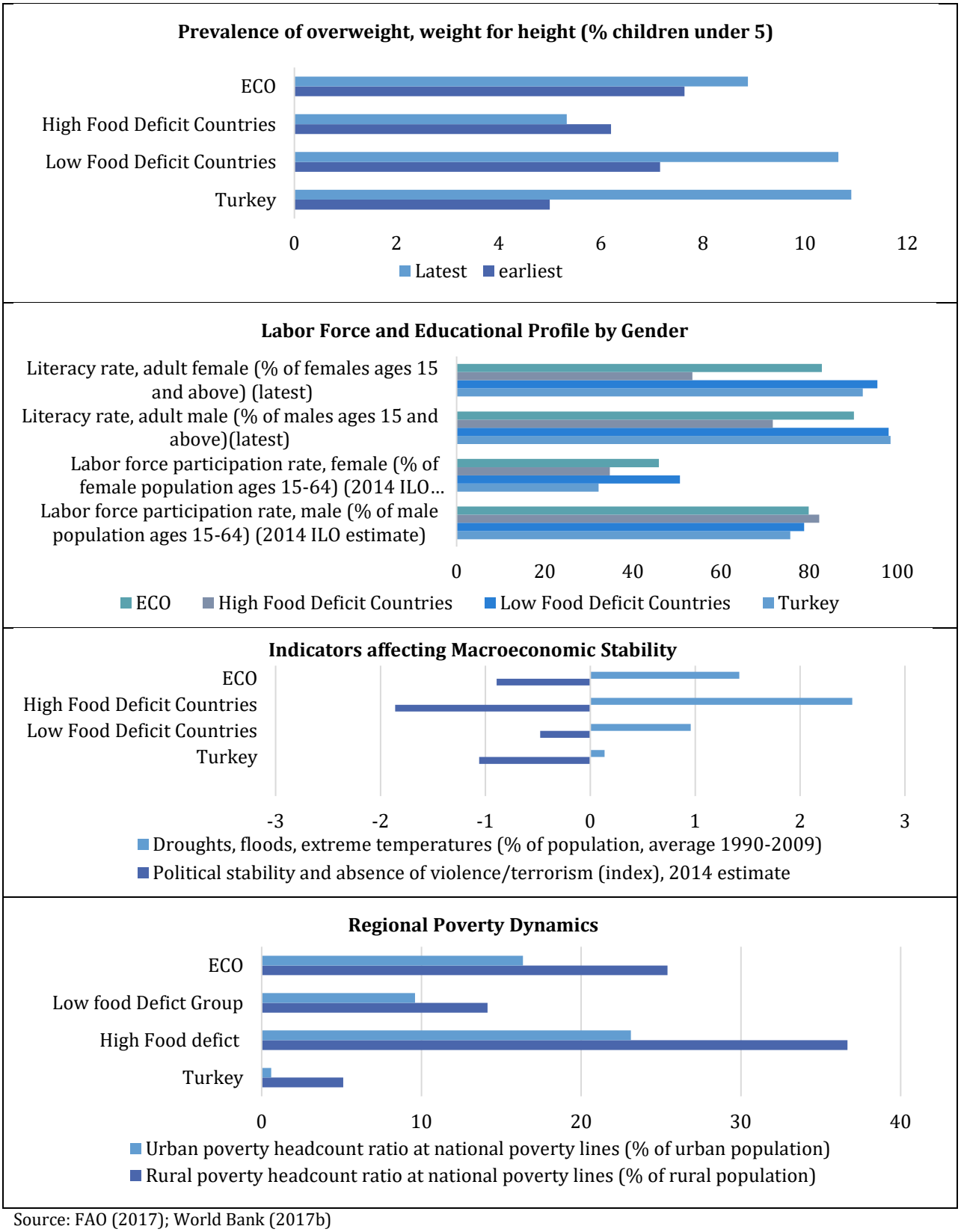
Source: World Bank (2017b)

Figure 8.23: Key Macroeconomic Variables - Turkey (Contd.)



Source: FAO (2017); World Bank (2017b)

Figure 8.24: Key Macroeconomic Indicators - Turkey (Contd.)



Source: FAO (2017); World Bank (2017b)

8.9. Turkmenistan

Turkmenistan, just like Azerbaijan, is another ECO country that is a low food deficit and oil-dependent country vulnerable to oil price shock as experienced, for example, in 2015[111]. Given that Turkmenistan is also depending heavily on cereal imports and rely on its foreign reserves to meet its cereal requirements, development of non-oil economy along with improvement of oil exports is vital for Turkmenistan. Some of the key economic patterns of Turkmenistan economy are discussed below:

In Turkmenistan, growth remained strong since late nineties. Real GDP growth in 2014 was recorded at 10.3 percent. However, lower global energy prices led to the fall in revenues from oil and natural gas exports, thus bringing down GDP growth to 6.5 percent in 2015. Growth remains highly dependent on hydrocarbons and related sectors. After the diversification of natural gas export routes in 2009, China became the largest export market for Turkmenistan[112].

In Turkmenistan, all sectors are expanding, but industry, with a maximum share in GDP, has shown robust performance because of expansion in hydrocarbons, electrical power and chemicals, coupled with a strong pickup in construction materials, textiles, food, and agro-industrial goods.

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[111] Lower oil prices and slack demand for energy products—especially natural gas, Turkmenistan's main export, sharply reduced export earnings in 2015. However, foreign exchange reserves were estimated at 30 months of import cover at end of 2015, hence protecting economy from major impact (PIDE ECO, 2018).

[112] Despite the ongoing diversification of markets, Turkmenistan's exports are increasingly dependent on a single large market, i.e., China and dominated by natural gas; making the economy vulnerable to fluctuations in global prices (PIDE ECO, 2018).

While final consumption expenditure (both household and general public) declined during the period 2008-2015, the decrease in spending is accommodated by increase in gross capital formation as well as net exports. Among the oil exporting countries in the region, Turkmenistan has the greatest share of net exports in total GDP. On the demand side, economic growth is supported by public investment. The government continued to support the private sector, encouraging import-substitution and export-promotion beyond the hydrocarbon economy, where most of the growth occurred (ibid). Turkmenistan recorded a fiscal surplus of 10 percent of GDP in 2008. Since then it has narrowed, turning into a deficit of 1.0 percent of GDP in 2015[113]. Lower hydrocarbon exports limited revenues in 2015[114]. Though FDI flows to ECO countries remain below their potential, in terms of GDP, Turkmenistan[115] is receiving a regional share of 12.3 percent (ibid).

Turkmenistan followed a tight monetary policy which slowed broad money growth since 2012. The Central Bank maintained its exchange rate peg[116] until 2014, strengthened by comfortable foreign exchange reserves. In the beginning of 2015, Turkmen Manat devalued by 19 percent, but with little effect on inflation (ibid). Turkmenistan is at the bottom in terms of external vulnerability within the region as its external debt amounted to

[113] This reflects continued spending on social programs, including rise in public wages, pensions, and students' stipends, along with higher investment outlay (PIDE ECO, 2018).

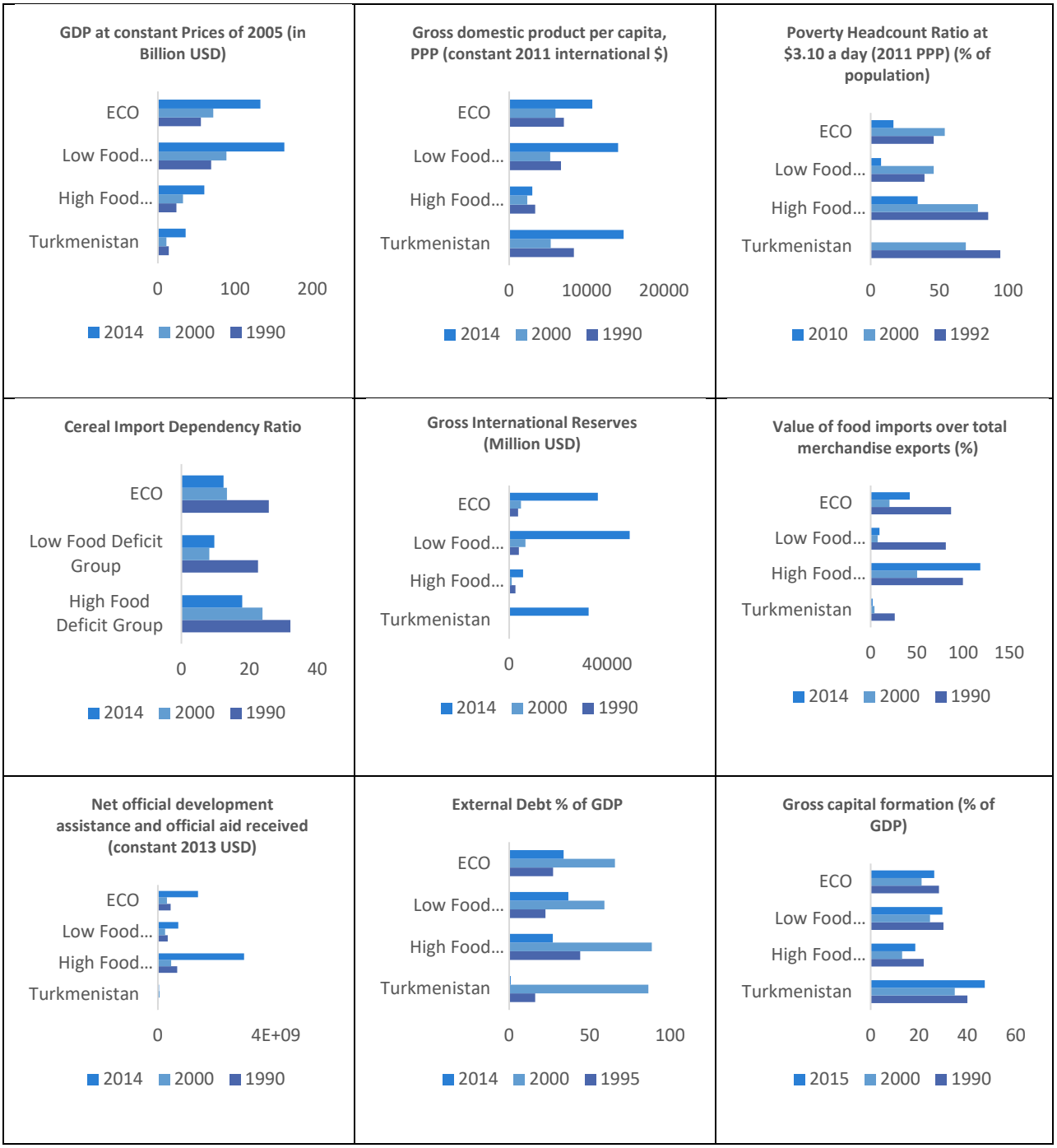
[114] Energy revenues largely covered the fiscal deficit in the non-hydrocarbon economy. It is estimated at 10.3 percent of GDP in 2015 (PIDE ECO, 2018).

[115] Mainly in hydrocarbons and construction (PIDE ECO, 2018).

[116] Exchange rate pegged at 2.85 per USD since 2009.

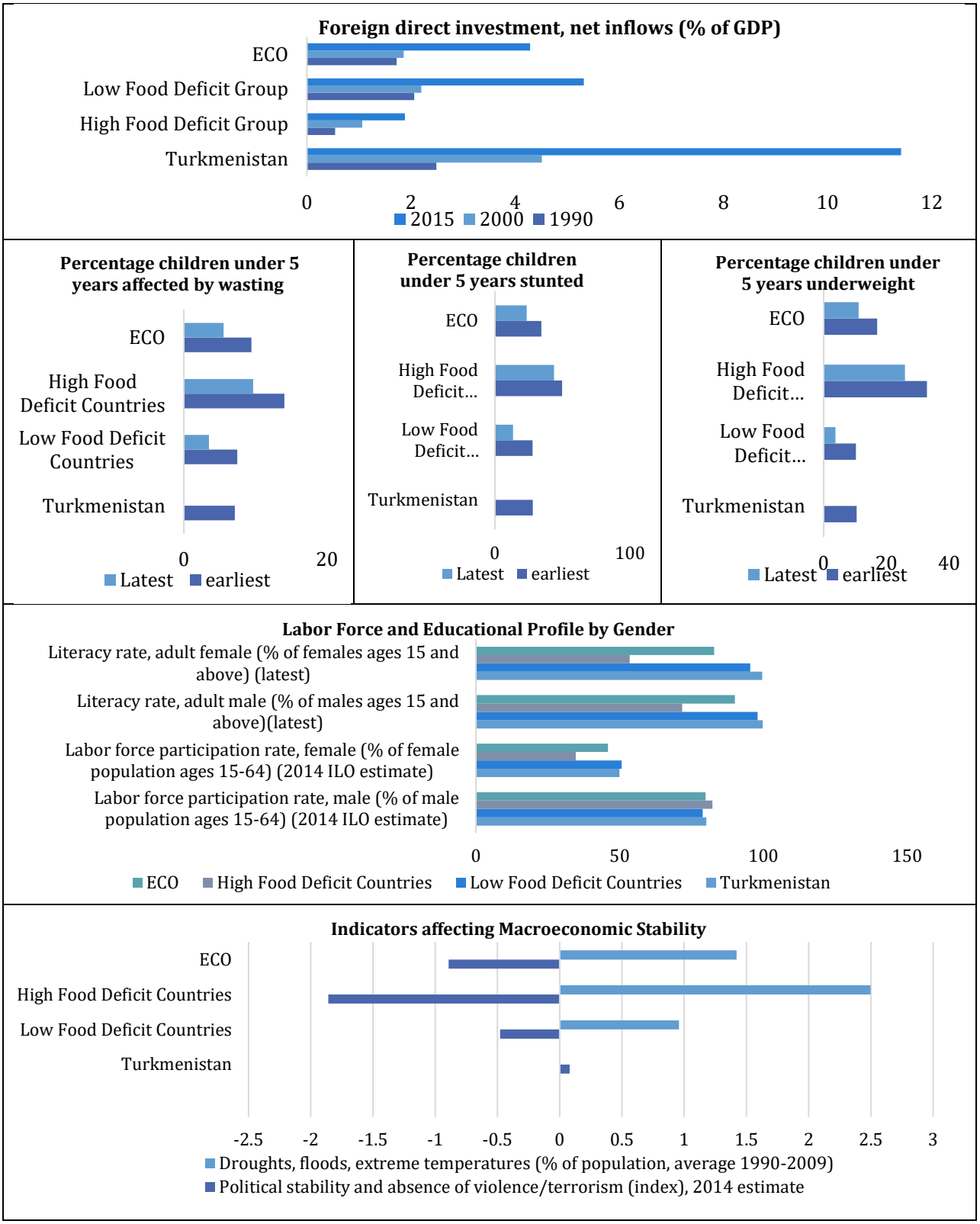
USD 0.4 billion and its ratio of total external debt to total GDP of 1 percent is lowest in the ECO region (ibid).

Figure 8.25: Key Macroeconomic Indicators - Turkmenistan



Source: World Bank (2017b)

Figure 8.26: Key Macroeconomic Indicators - Turkmenistan (Contd.)



Source: FAO (2017); World Bank (2017b)

8.10. Uzbekistan

Uzbekistan has successfully achieved the MDG target 1c by 2015. In terms of chronic indicators of hunger, though children under age five are showing acceptable level of wasted and underweight growth on average but still problems of stunted growth and obesity still remain an important concern as can be seen from patterns in figure 8 below.

Growth remained robust at an average of around 8 percent led by wage and pension increases, high public investment spending, and large inflow of remittances. Increased exports of gas, gold, and copper, combined with high commodity prices, have generated revenues that have financed large increases in investment and salaries to strengthen consumption. However, recession in Russia and slow growth in China and declining prices of export commodities -- natural gas, copper and cotton --- have contributed to a slight reduction in GDP growth in 2015 (PIDE ECO, 2018).

Despite robust GDP growth over the past decade or so, Uzbekistan's population is still at mild risk of international price shocks because of cereal import dependency as well as reliance on the Russian economy in terms of trade and inflow of remittances[117]. Further, Uzbekistan is facing high ratio of external debt to GDP ratio in the region[118] along with

[117] Russia is second largest trading partner after China and a main source of remittances.

[118] The total external debt stock in ECO region continues to increase and it reached USD 672.9 billion in 2014; it is almost double to the amount recorded in 2006. Turkey is the most indebted country of the region accounting for 60.7 percent share from total external debt of countries of the region in 2014 whereas Kazakhstan, Pakistan, and Uzbekistan are categorized in the next places (PIDE ECO, 2018). Further public and private external debt are estimated to have increased to 21.2 percent of GDP in 2014 with gross official reserves were estimated at USD 24.4 billion in 2015 (ibid).

weak global trade trends with its share of trade to GDP ratio showing declining trend post 2010. As of 2015 estimates[119], Uzbekistan has become less competitive in exports resulting in narrowing of current account surplus[120] from 16.9 percent in 2006 to 0.3 percent of GDP in 2015.

The narrowing of current account surplus reflects a decline in trade surplus and remittances owing to a slowdown in Russian Federation during late 2014 which significantly affected Uzbekistan's external sector. Weak consumer demand in Russia, coupled with rapid nominal appreciation of the Uzbek sum against the ruble hurt bilateral trade between the two countries. Also diminished labor demand in construction and logistics, the main employers of Uzbek migrants, led to decline in remittances from the Russian Federation. Further slowdowns in Kazakhstan, the Republic of Korea, also constrained Uzbekistan trade. (PIDE ECO, 2018).

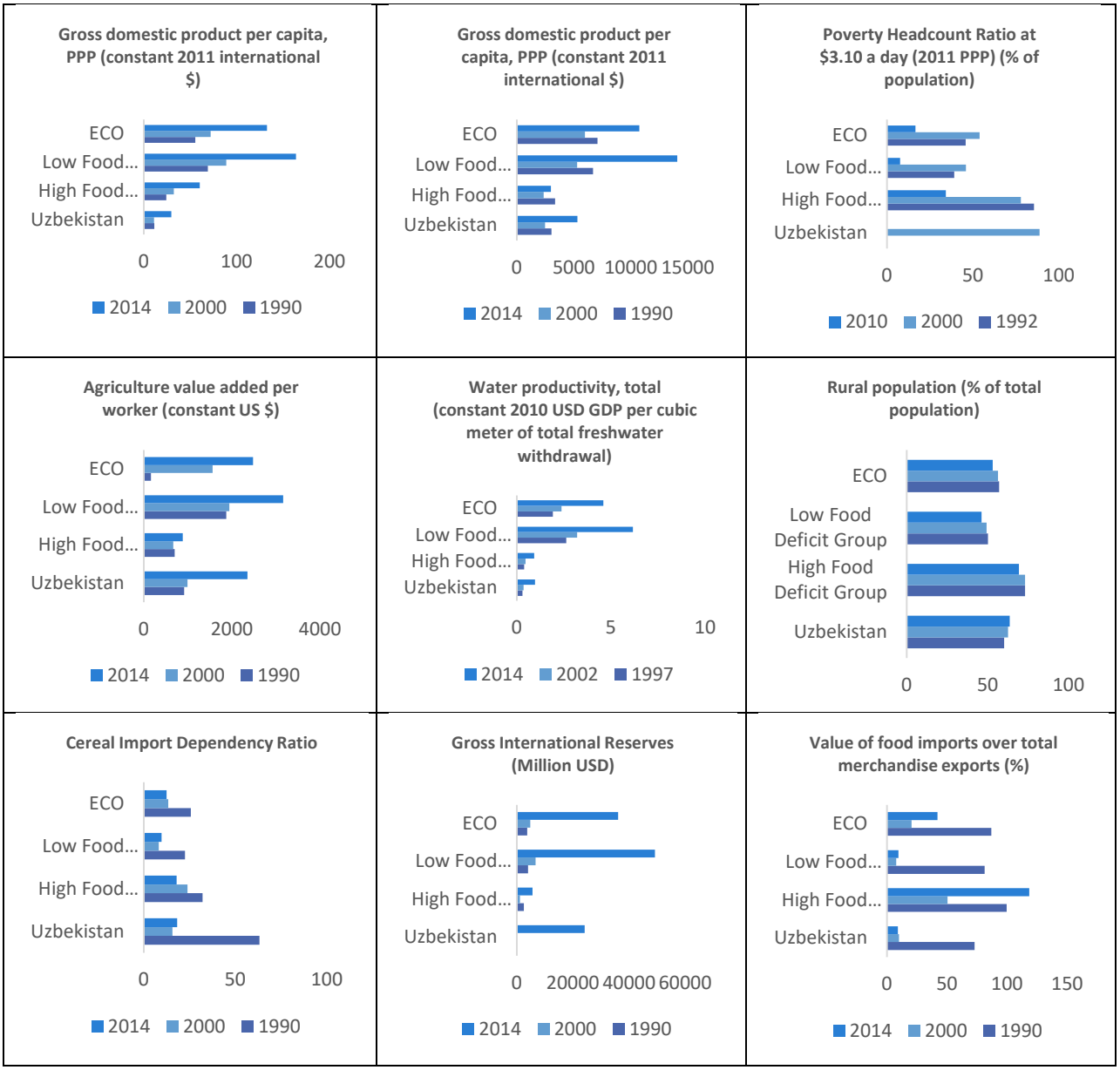
In the context of agricultural growth one positive element is the existence of favorable climatic conditions along with availability of adequate sources of irrigation water which indicate potential for a strong agro-based economy. However, the agricultural sector lacks diversification and cotton is the main agricultural crop. Uzbekistan is an exporter of cotton which accounts for about 40 percent of the gross value of agricultural production.

[119] The Central Bank in Uzbekistan has been continuously lowering the official exchange rate of the Uzbek sum against the US dollar (the unofficial rate fell even faster in the parallel market). Taking into account weaker currencies across the Commonwealth of Independent States, the Uzbek sum is estimated to have appreciated in real terms making exports less competitive in 2015 (PIDE ECO, 2018).

[120] Uzbekistan is the only country in the region with a current account in surplus (PIDE ECO, 2018).

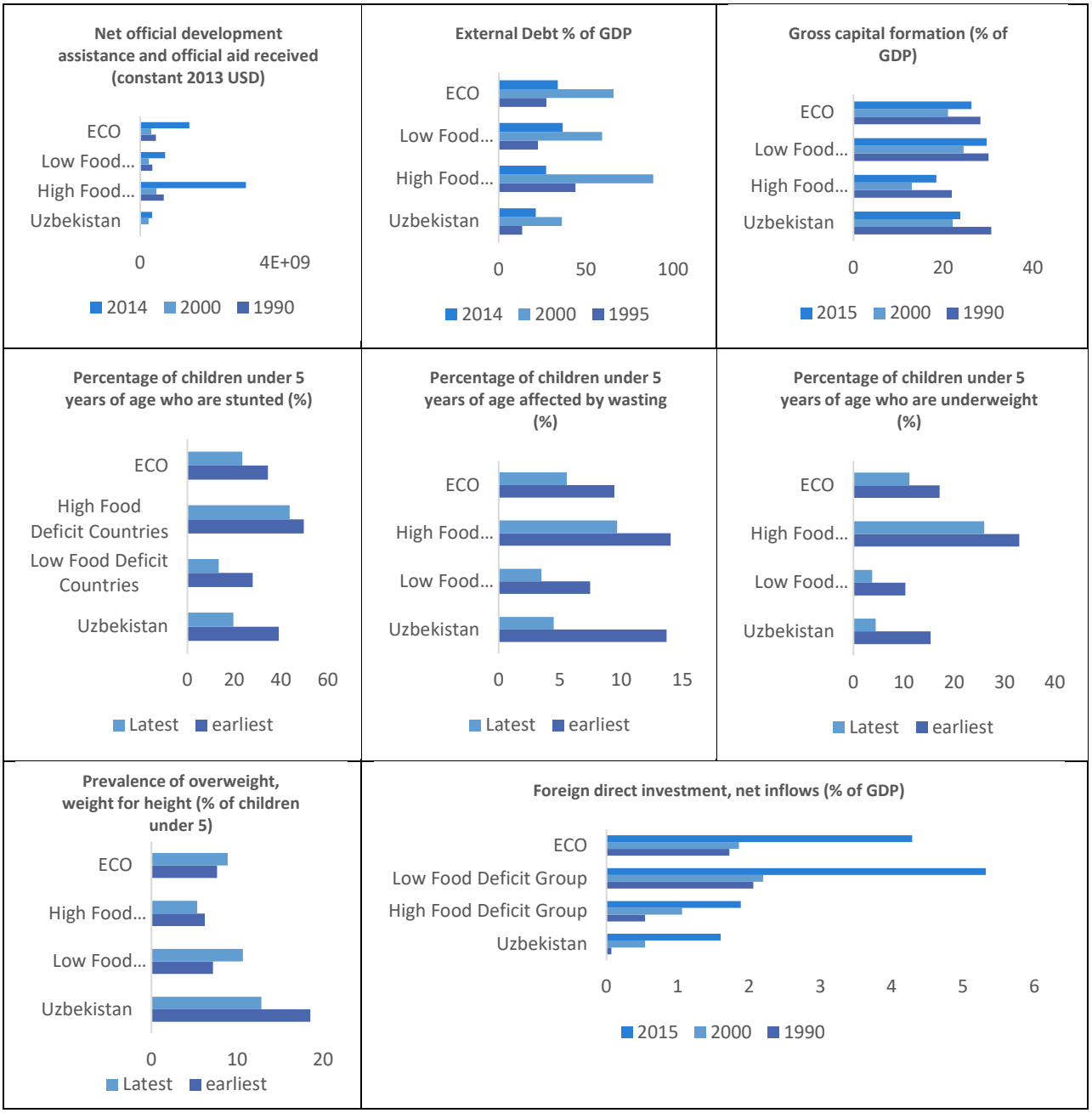
Due to lack of domestic production, Uzbekistan requires large-scale imports of grain and other foods that are not grown domestically in sufficient quantities.

Figure 8.27: Key Macroeconomic Indicators - Uzbekistan



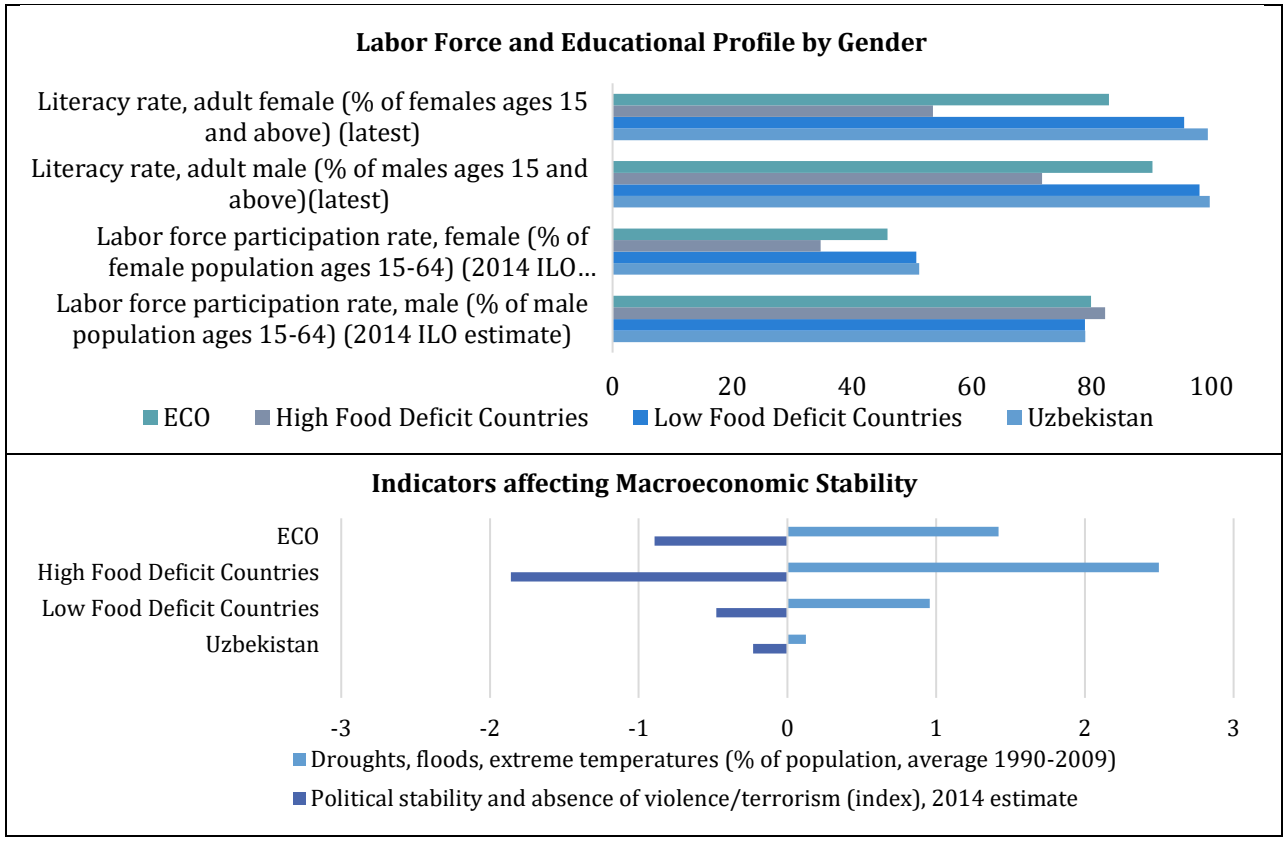
Source: World Bank (2017b)

Figure 8.28: Key Macroeconomic Indicators - Uzbekistan (Contd.)



Source: FAO (2017); World Bank (2017b)

Figure 8.29: Key Macroeconomic Indicators - Uzbekistan (Contd.)



Source: FAO (2017); World Bank (2017b)

Chapter 9 - Conclusions

This study has carried out a comprehensive analysis of food security issues in the ECO region. In so doing, the study has identified the key challenges facing the regional economies in terms of assuring access to food and spelled out strategies to improve various dimensions of food security. A comparative perspective of food security situation in the ECO member countries shows that there are large variations in ECO member countries in terms of food security. The agriculture sector is the backbone of the agrarian economy and its productivity can be an important factor in ensuring adequate availability of food. A review of agriculture sector in major ECO economies reveals that while Pakistan, Turkey and Iran have significant agro-based economies, other countries lack a diversified agricultural sector and thus depend on imports of major crops. This situation indicates potential for cooperation among the ECO member countries to ensure food security for their citizens.

The performance of the ECO member countries in meeting the MDG hunger goal is mixed. Tajikistan, Afghanistan and Pakistan could not meet this target and are thus vulnerable in terms of food and nutritional situation which needs immediate policy attention. However, we find that high food inadequacy within these countries is not a problem of food availability but of food access. Further looking deeper into country specific temporal patterns within the high food deficit region, we can see that Pakistan holds the largest size of under nourished population with Afghanistan and Tajikistan at respective second and third position but in terms of prevalence rate of undernourishment Tajikistan tops the list followed by Afghanistan and Pakistan.

In terms of access to food, on average the ECO countries which have successfully fulfilled the MDGs have relatively strong pro-poor growth process than those that could not meet these targets by 2015. This emphasizes a fundamental role of poverty alleviation strategies in tackling hunger issue within ECO region. In terms of chronic hunger, our estimates show that malnourishment is more an issue of high food deficit countries namely Tajikistan, Afghanistan and Pakistan. Obesity is an issue in countries that successfully decreased undernourishment prevalence rate to meet the MDG specified limits including Iran, Turkey, Azerbaijan, Kazakhstan, Kyrgyzstan, Turkmenistan and Uzbekistan.

The prevalence of Hunger and malnourishment within ECO region is primarily concentrated in three high food deficit ECO countries; namely Afghanistan, Pakistan and Tajikistan. While the rest of the ECO countries have effectively handled the issue of undernourishment, but these countries are now facing other health risks due to excessive nutrition and obesity. Hence both these regions require different policy responses: whereas the prime policy challenge for Afghanistan, Pakistan and Tajikistan is to ensure stable and secure sources of food for their vulnerable households, in low food deficits countries the policy focus needs to be on educating citizens about effective means of health management to control weight gain and /or child stunting that is still prevailing in some low food deficit countries.

Based on a review of productive structures of individual countries and international evidence on food security, we have argued that to achieve the target of food security within

high food deficit ECO countries it is important to focus on institutional, social, economic, demographic and environmental constraints that may limit the performance of the agricultural sector. The agriculture sector has been found to be more productive in low food deficit countries than in countries which could not eliminate hunger from their boundaries as per MDGs deadlines. This clearly suggests that the agriculture sector and rural development are important pieces in puzzle of how best to achieve a hunger free domain.

The demographic structure of a country has an important bearing on food security situation. In terms of demographic dynamics, low food deficit countries have protected themselves from population pressures by keeping population growth rates at substantially lower levels on average than high food deficit countries. Therefore, population control is an important aspect in ensuring food security within an economy especially in context of Afghanistan and Pakistan - the two high food deficit countries that have substantially high population growth rates coupled with rising proportions of undernourished population.

The performance of the agriculture sector and overall macroeconomic environment significantly influence food security situation in an economy. The analysis of structural differences in terms of indicators of agricultural and overall macroeconomic performance across low and high food deficit areas suggests that the low food deficit countries with stable macroeconomic indicators and robust agriculture sector performed better on average in terms of eradicating hunger. This clearly shows that policies to boost

agricultural productivity as well as to create a stable macroeconomic environment through prudent fiscal and monetary policies can be instrumental in promoting food security.

With some exceptions, the ECO countries are investing in increase domestic food production to secure domestic food supply especially in terms of staple food and non-staple food items like vegetables and fruits, roots and tubers, meat, livestock and milk products. This is evident in growth patterns since 2000 for most ECO countries, resulting in an increase in overall food production within ECO region. However irrespective of increasing domestic productive base within most ECO countries over time we find increasing trend of dependence on global markets for food items given overall trade deficits in food items are increasing overtime in most ECO countries except Pakistan where it is decreasing and Turkey where there are trade surpluses in food categories.

The ECO countries have followed different policies to ensure a secure supply of food to domestic households. In five low food deficit countries namely Turkey, Iran, Azerbaijan, Kyrgyzstan, and Uzbekistan, a policy focus on diversification towards fruits and vegetables and reliance on international markets for cereal requirements is evident. Kazakhstan follows a policy of self-sufficiency in cereal requirements while in Turkmenistan there are no clear patterns in the context of diversification and/ or food independence policy. In the high food deficit zone in Pakistan there is a policy of self-sufficiency, while in Afghanistan and Tajikistan, contrary to the traditional focus on food independence policy, there is evidence of dependence on global markets to meet cereal needs.

Finally, global evidence shows that international price shocks can have an adverse impact on food security situation. The present study has examined the vulnerability of ECO countries to international price shocks as have happened in recent past in 2007-08 and 2010-11. The analysis shows that Tajikistan, Kyrgyzstan, Afghanistan and Pakistan are at extreme risk of international price shocks, Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan are at a moderate risk, while Turkey and Iran are not vulnerable to international price shocks. One significant avenue for the ECO countries to reduce their vulnerabilities to international price shocks is to develop mechanisms for regional economic cooperation with a view to mitigating risks to food security. In particular, the ECO countries can aim to boost agricultural productivity through joint research and extension programs based on learning from each other's experience. Similarly, intra-regional trade in agricultural products can be important in ensuring access to food in the ECO member countries. Such regional economic cooperation initiatives are expected to enable the ECO countries to boost their agricultural productivity, address the problem of poverty and eliminate hunger in line with the MDG goals.

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Appendix A - Tables

Appendix Table A.1: Number of Undernourished

Year	1990-1992	2000-2002	2005-2007	2010-2012	2014-2016
Afghanistan	3.8	10	8.3	7.1	8.6
Azerbaijan	1.8	1.4	NS	NS	NS
Iran	2.9	3.8	4.7	4.7	NS
Kazakhstan	NS	NS	0.8	NS	NS
Kyrgyzstan	0.7	0.8	0.5	0.4	0.3
Pakistan	28.7	34.4	38.1	38.3	41.4
Tajikistan	1.6	2.5	2.8	2.9	2.9
Turkey	NS	NS	NS	NS	NS
Turkmenistan	0.4	0.4	0.2	NS	NS
Uzbekistan		3.6	3.3	2.2	NS
Central Asian ECO Countries	2.7	7.3	7.6	5.5	3.2
South Asian ECO Countries	35.4	48.2	51.1	50.1	50
ECO Region	39.9	56.9	58.7	55.6	53.2
World	1010.7	929.6	942.3	820.6	792.5

Data Source: FAOSTAT

Note: NS - Not significant

Appendix Table A.2: Undernourished Population Reduction Rate

Year	2000-2002	2005-2007	2010-2012	2014-2016
Afghanistan	163.2	118.4	86.8	126.3
Azerbaijan	-22.2	NA	NA	NA
Iran	31	62.1	62.1	NA
Kazakhstan	NA	NA	NA	NA
Kyrgyzstan	14.3	-28.6	-42.9	-57.1
Pakistan	19.9	32.8	33.4	44.3
Tajikistan	56.3	75	81.3	81.3
Turkey	NA	NA	NA	NA
Turkmenistan	0	-50	NA	NA
Uzbekistan	NA	NA	NA	NA
Central Asian ECO Countries	170.4	181.5	103.7	18.5
South Asian ECO Countries	36.2	44.4	41.5	41.2
ECO Region	42.6	47.1	39.3	33.3
World	-8	-6.8	-18.8	-21.6

Source: FAO (2017)

Note: NA - Not applicable

Reduction rate from 1990-92 baseline

Appendix Table A.3: Prevalence Rate of Undernourishment

Year	1990-1992	2000-2002	2005-2007	2010-2012	2014-2016
Afghanistan	29.5	46.7	32.3	24.3	26.8
Azerbaijan	23.6	17.1	<5	<5	<5
Iran	5.1	5.6	6.6	6.2	<5
Kazakhstan	<5	<5	5	<5	<5
Kyrgyzstan	15.9	16.7	9.4	7.2	6
Pakistan	25.1	23.4	23.7	21.8	22
Tajikistan	28.1	39.5	40.5	36.8	33.2
Turkey	<5	<5	<5	<5	<5
Turkmenistan	8.6	8.4	5.1	<5	<5
Uzbekistan	<5	14.4	12.4	7.7	<5
Central Asian ECO Countries	10.5	15.8	14.5	10.3	7.8
South Asian ECO Countries	19.9	25.2	20.9	17.4	16.3
ECO	15.1	18.2	14.5	12.4	11.8
World	18.6	14.9	14.3	11.8	10.8
Source: FAO (2017)					

Appendix Table A.4: Reduction Rate in prevalence rate of undernourishment

Year	2000-2002	2005-2007	2010-2012	2014-2016
Afghanistan	58.3	9.5	-17.6	-9.2
Azerbaijan	-27.5	NA	NA	NA
Iran	9.8	29.4	21.6	NA
Kazakhstan	NA	NA	NA	NA
Kyrgyzstan	5	-40.9	-54.7	-62.3
Pakistan	-6.8	-5.6	-13.1	-12.4
Tajikistan	40.6	44.1	31	18.1
Turkey	NA	NA	NA	NA
Turkmenistan	-2.3	-40.7	NA	NA
Uzbekistan	188	148	54	NA
Central Asian ECO Countries	50.2	37.6	-1.7	-25.5
South Asian ECO Countries	26.8	4.9	-12.4	-18.3
ECO	-6.4	-25.3	-36.1	-39.2
World	-19.9	-23.1	-36.6	-41.9

Source: (FAO, 2017)

Note: Reduction from 1990-92 baseline

NA - Not applicable

Appendix Table A.5: Depth of the food deficit (kcal/capita/day) (3-year average)

Year	1990-1992	2000-2002	2005-2007	2010-2012	2014-2016
Turkey	3	6	4	2	1
Azerbaijan	163	118	26	18	12
Kazakhstan	18	33	35	20	18
Kyrgyzstan	105	117	66	50	40
Turkmenistan	57	55	34	32	22
Uzbekistan	20	95	84	52	29
Iran	31	39	48	45	31
Tajikistan	187	281	319	286	250
Afghanistan	202	326	201	149	173
Pakistan	179	172	181	167	172
Low Food Deficit Group	56.7	66.1	42.4	31.3	21.9
High Food Deficit Group	189.3	259.7	233.7	200.7	198.3
Eco	96.5	124.2	99.8	82.1	74.8

Source: FAO (2017)

Appendix Table A.6: Growth in Depth of food deficit

Year	1991-2001	2001-2011	2011-2015	2001-2015
Low Food Deficit Group	16.6	-52.7	-30.1	-67
High Food Deficit Group	37.1	-22.7	-1.2	-23.6

Source: (FAO, 2017)