

Food Security Issues in the ECO Region

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1. Introduction

Ensuring food security has become a serious challenge for the developing countries including some ECO member states. According to the Food and Agriculture Organization (FAO) Report 2015 titled 'The State of Food Insecurity in the World', about 795 million people remain undernourished globally. In other words, 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.¹

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 respect to people living in mountainous areas with 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

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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 with longer-term priorities in perspective. 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 situation.

Against this backdrop, the study has been organized as follows: Section 2 presents an overview of food security from 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. Heterogeneities within the ECO region are discussed in the following section, and Section 4 highlights areas of cooperation for ensuring food security in the region. Section 5 discusses the implications of the findings and concludes the chapter.

2. Achieving Food Security

The commitment to the fulfillment of the First Millennium Development Goal (MDG 1), i.e. eradication of extreme poverty and hunger, in international and national agendas all over the world had important consequences in the 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 it is by no means sufficient. There are many more dimensions in the 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 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 the ECO region and its determinants, it is important to evaluate how countries that have failed to achieve the MDG1C (MDG 1 Target 3: Halve the proportion of people suffering from hunger) and World Food Summit (WFS) 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.

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 years to regenerate to compensate for 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 “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 continuing global concern. Accordingly, UN Millennium Development Goals (2000-15) are superseded by the UN Sustainable Development Goals (SDG) 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 are needed to alleviate food crises in developing countries. Many determinants of food-security are trans-border and require multilateral agreements and actions for an 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 fulfillment of the Millennium Development goals of 2015 has passed just recently, this affords us an ideal threshold to judge the commitment level within the ECO region on the issue of ensuring food security.

2.1. ECO Progress

The ECO region encompasses approximately half a billion people that may be bound 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 their demographic and economic structures, which suggests the need to look at individual country performance in terms of hunger eradication from the 1990-92 baseline. In the present context, this is accomplished by dividing the 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 the Central Asian ECO group, due to their common economic and political history.

South Asian economies account for three-quarters of the almost half-billion population of the region. Tracing the pattern of prevalence rate of undernourished population rate across South Asian and Central Asian ECO sub-divisions (Figure 8.1), it is evident that the prevalence of undernourished people is higher in the South Asian sub-region as compared to the Central Asian sub-region (16.2 percent versus 7.84 percent).

Looking into progress made towards achieving the MDG1C goal of reducing the proportion of the undernourished population in the total population to half between the period 1990 and 2015 or a level of less than 5, there is a positive progress in the region. More specifically, there has been an overall reduction in the 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.

Looking into the dynamics within the ECO region and its sub-regions regarding percentage change in the proportion of undernourished people in the population and the absolute number of undernourished populations, there exist discrepancies in performance towards MDG and WFS goals (Figure 9.2). The WFS target is much more stringent than the MDG target as it is invariant to changes in the total population (Figure 9.3). The countries which are showing a discrepancy between their progress towards MDG and WFS Hunger goals indicate that within these regions, reduction in the prevalence rate of undernourishment as required in MDG target may not be necessary because of a fall in the absolute number of undernourished, but rather these results might have been driven by growth in population. It is important to assess the impact of growth in the total population on the growth of the undernourished population.

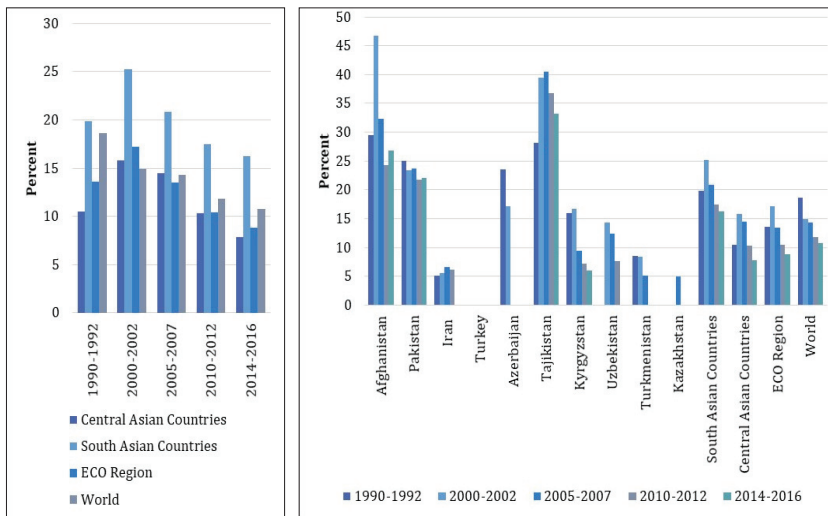


Figure 9.1. Prevalence of undernourishment: 1990-92 to 2014-16

Source: FAO. "FAOSTAT." FAO. 2017. <http://www.fao.org/faostat/en/#home>.

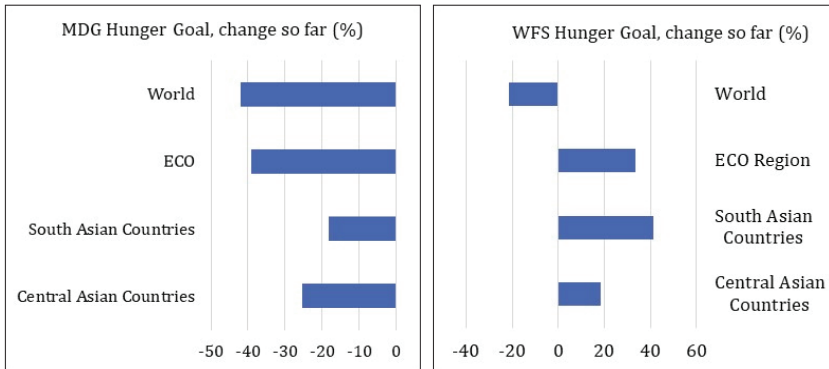


Figure 9.2. Progress towards the achievement of MDG and WFS Hunger Goals

Source: FAO, "FAOSTAT." 2017.

The countries that are most vulnerable in terms of the population exposed to hunger risks are Tajikistan, Afghanistan, and Pakistan. As a group, these countries had a much higher level of food deficit in 2015 (198.3 kcal/capita/day versus 21.85 kcal/capita/day in other ECO countries). Furthermore, these countries are also documenting weaker performance in food deficits compared to the remaining countries.

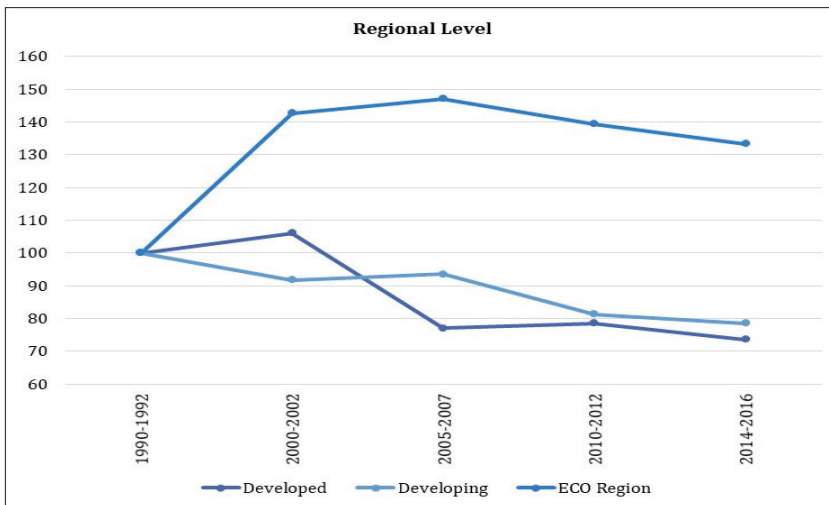


Figure 9.3. Progress toward the WFS hunger target (Index: 1990/92=100)

Source: FAO, "FAOSTAT." 2017.

3. Regional Heterogeneities

Low and high food deficit ECO countries vary not only in terms of geographical endowments but also how these endowments are being utilized to create more productive outcomes. The analysis below highlights the agriculture dependence of countries, and how this varied dependence is contributing to the overall macroeconomic setting in these two regions.

3.1. Heterogeneities within the ECO Region

Within the ECO region, a number of heterogeneities in the context of food security are evident in terms of:

- Link between agricultural endowment and agricultural productivity
- The overall profile of macroeconomic conditions and various policy instruments
- Extent of agricultural dependence across low and high food deficit ECO regions.

3.1.1. Agriculture Endowment and Productivity Link

In terms of a physical endowment for any country, the quality and not the size of the arable land is the most important factor from the perspective of agriculture. This suggests the availability of agricultural land and the availability of water resources are two critical elements of concern. Coupled with trends of agricultural productivity across low and high food deficit zones within the ECO region, the following patterns emerge.

In terms of the endowment of arable land, we find that on average high food deficit region (mainly due to mainly inclusion of Pakistan in this group) is more endowed than the low food deficit region (Figure 9.4). In terms of the endowment of permanent crop area, the low food deficit region takes the lead primarily due to much higher share in Turkey and Azerbaijan. Low food-deficit countries are also documenting better growth tendencies of agricultural value-added per worker irrespective of agricultural capacities. At a disaggregated level, the most notable countries are Turkey, Kazakhstan, Turkmenistan, Uzbekistan, and Iran (Figure 9.5). In the high food deficit region, even though Tajikistan shows positive signs in agricultural productivity, Pakistan and Afghanistan show stagnant patterns post-2000.

Not only does the low food deficit region have much higher availability of water resources per person per year, but water productivity out of freshwater withdrawal is also substantially more as compared to the high food deficit countries (Figure 9.6). Coupled with a much higher growth rate of arable area equipped for irrigation post-2000, better water availability explains why the agricultural sector in the low food deficit region is much more productive.

Finally, in terms of environmental risks, the usage of fertilizer is much higher in the high food deficit region than in the low food deficit region, primarily due to a higher level of usage in Pakistan and Tajikistan. However, risk in future degradation of agricultural land due to intensive fertilizer use is an issue even among countries that have curtailed hunger. For example, within Turkey and Uzbekistan, not only is there substantial reliance on these chemicals to boost agricultural output but its use is increasing at a positive rate over time.

The low food deficit region is on average much better placed in terms of agricultural sector performance (especially in comparison to Pakistan and Afghanistan). This finding is in line with strong empirical support from international research that agricultural growth has not only been found to be pro-poor in the sense of reducing poverty and raising the income of lower quintile, but has been more effective in poverty eradication in comparison to other sectors.²

² Chenery et al. *Redistribution with Growth: Policies to Improve Income Distribution in Developing Countries in the Context of Economic Growth*, ed. Ian Bowen and Brian J. Svikhart. 3rd ed. (New York: Oxford University Press, 1979); Lipton and Ravallion, "Poverty and Policy," in *Handbook of Development Economics*, ed. Jere Behrman and T.N. Srinivasan, Vol. 3B, (North Holland, 1995), 2551-2657. Eastwood and Lipton, "Pro-Poor Growth and Pro-Growth Poverty Reduction: Meaning, Evidence, and Policy Implications," *Asian Development Review* 18, no.2 (June 2000): 22-58. Christiaensen, Demery, and Kuhl "The (Evolving) Role of Agriculture in Poverty Reduction-An Empirical Perspective." *Journal of Development Economics* 96, no. 2 (2011): 239-54.

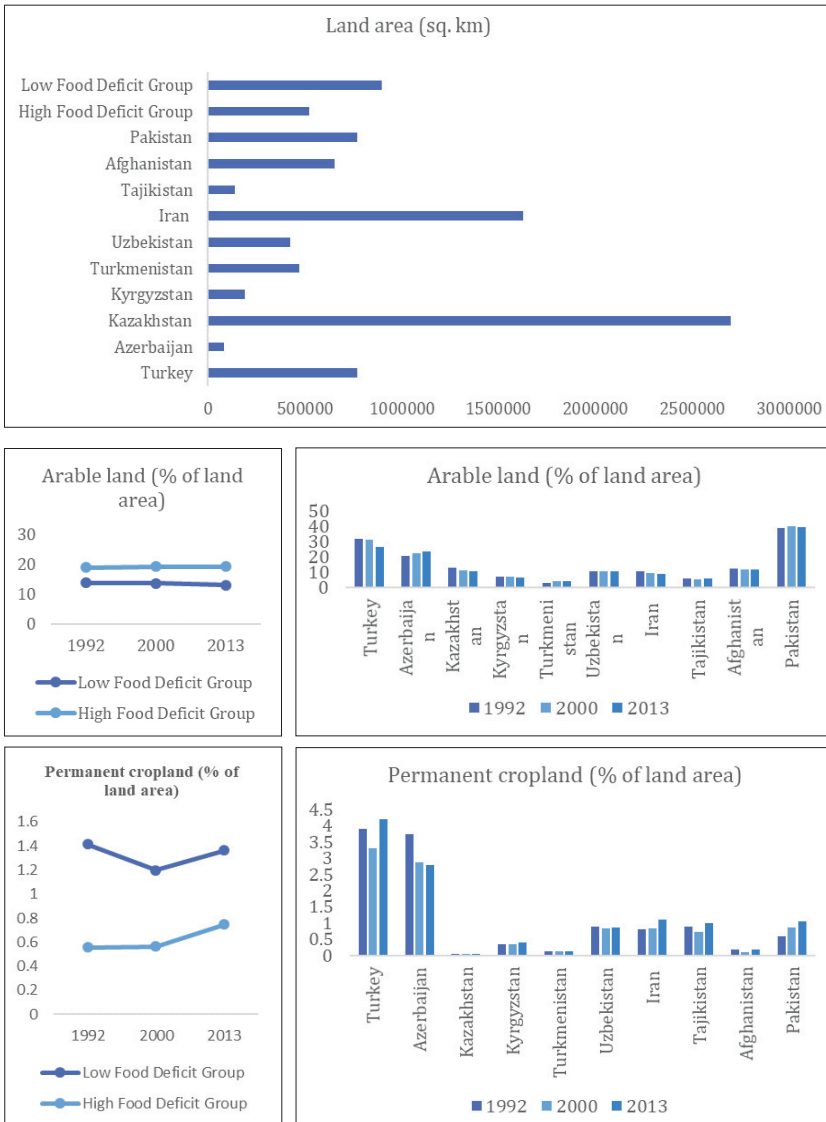


Figure 9.4. Agricultural Productivity, Arable Land, Permanent Cropland Endowment

Note: Data tables corresponding to these graphs are available from the authors on request

Source: FAO, "FAOSTAT.", 2017.; World Bank, *Increasing the Impact of Public Spending on Agricultural Growth: Myanmar Agricultural Public Expenditure Review*. (Washington, DC: 2017). <https://openknowledge.worldbank.org/handle/10986/27557?show=full>.

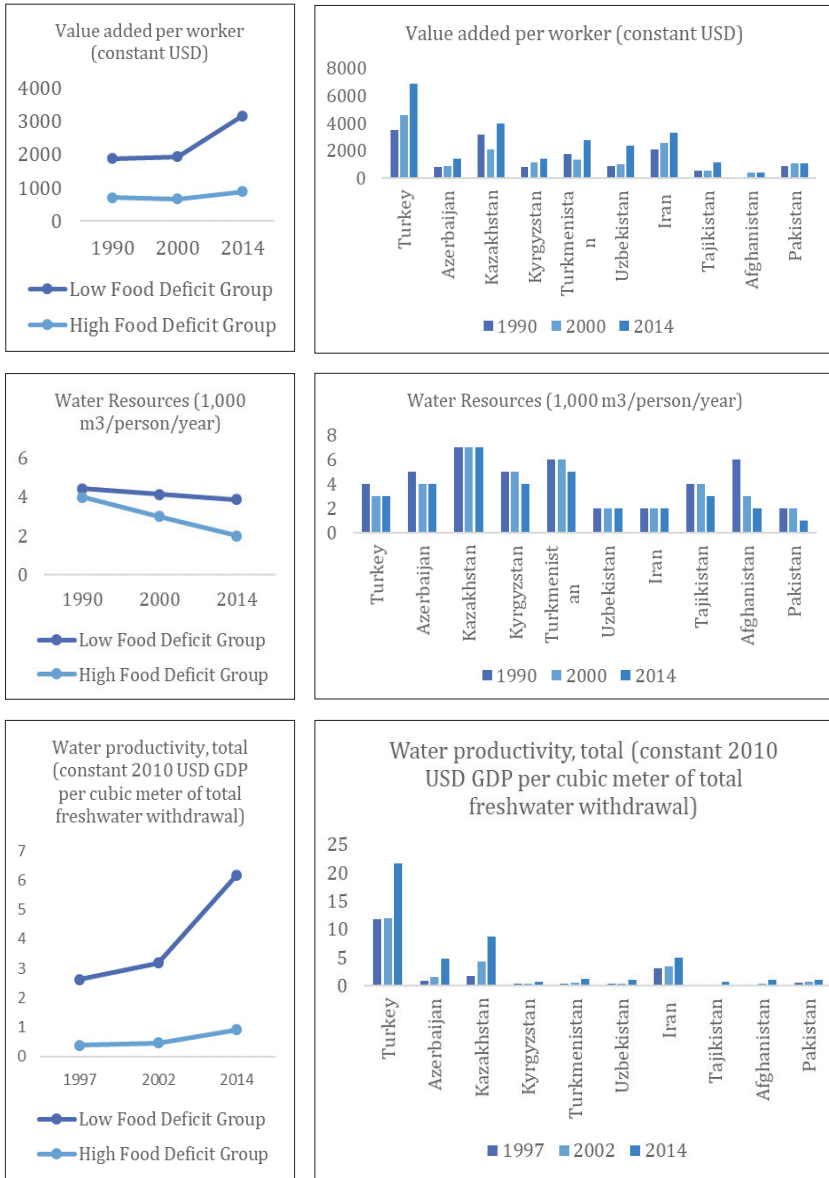


Figure 9.5. Comparison of Agricultural Land Endowment and Productivity

Note: Data tables corresponding to these graphs are available from the authors on request

Source: FAO, "FAOSTAT.", 2017.; World Bank, "Increasing the Impact of Public Spending on Agricultural Growth." Washington: 2017.

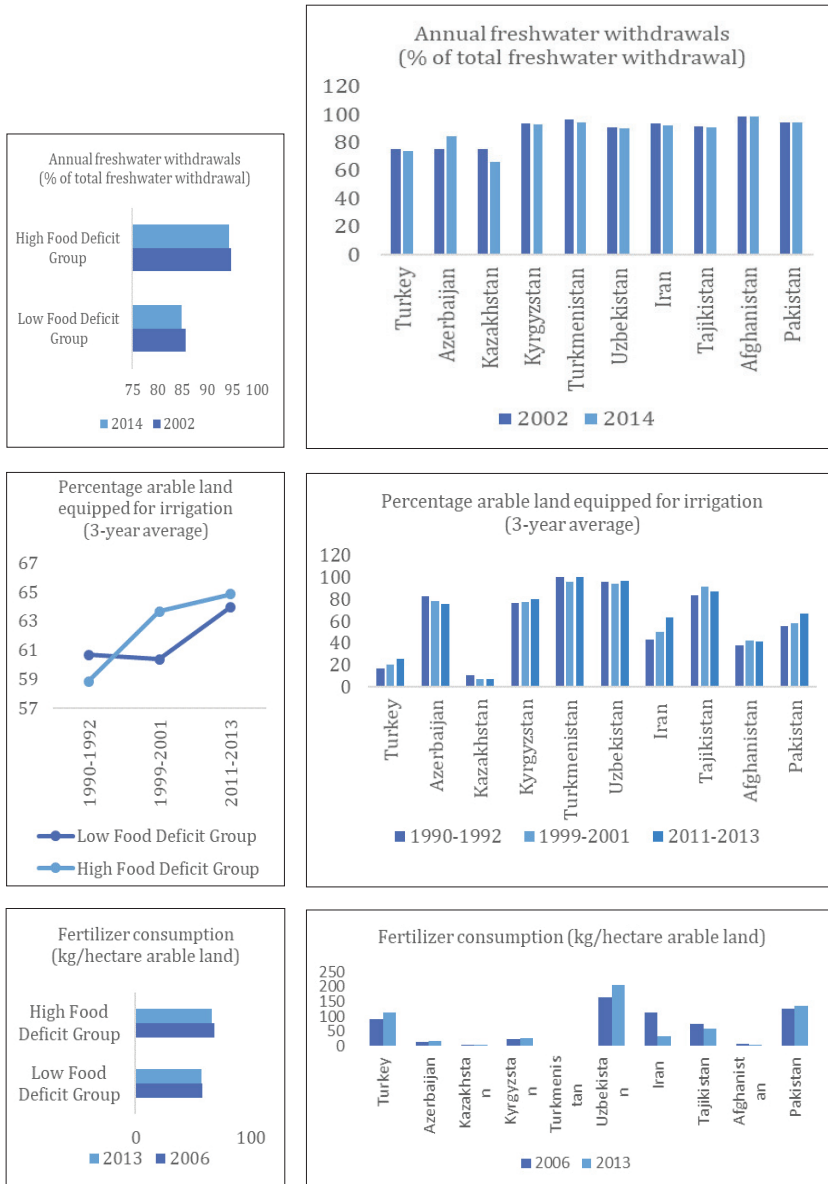


Figure 9.6. Freshwater Withdrawals and Arable Land Irrigation

Note: Data tables corresponding to these graphs are available from the authors on request

Source: FAO, "FAOSTAT.", 2017.; World Bank, *Increasing the Impact of Public Spending on Agricultural Growth: Myanmar Agricultural Public Expenditure Review*. (Washington, DC: 2017).

This effect is more evident in the case of developing countries where the locus of poverty is primarily in the rural area³. The forthcoming ECO-PIDE Study on Food Security in the ECO Region provides evidence that food security within the region has emerged as more of an issue of food access than availability.

Another important pattern that is evident from the analysis above is that disadvantageous agricultural endowments are not reason for weaker performance of the agricultural sector in low food-deficit countries. Empirical evidence in the case of Pakistan suggests that in spite of the country's well-endowed agricultural land, Pakistan is unable to generate opportunities for growth in this sector especially post 2000. The below section below looks at the macroeconomic and institutional capabilities in such countries and provides a comparison with other LIFDCs to explain their weaker performance in the agricultural sector.

3.1.2. Macroeconomic Conditions and Policy Environment

Agricultural growth is no doubt an important element in ensuring food security of the population and keeping poverty and hunger levels in check, yet it is far from being the only factor. The agriculture sector can act as a game-changer for eliminating poverty and increase access of poorer segments to safe and nutritious food, but it is necessary to understand how other structural elements such as indicators related to fiscal, monetary, and trade policies and socioeconomic development within each ECO country influence the total process, along with how far the country has progressed in shifting away from an agrarian society towards an economy with a strong industrial base.

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 objectives⁴. Monetary policy also has an impact on agricultural growth through the channel of interest rate and general macroeconomic environment. Computable general equilibrium

³ Chenery et. al, *Redistribution with Growth: Policies to Improve Income Distribution in Developing Countries in the Context of Economic Growth* 1979; Michael Lipton, *Why Poor People Stay Poor : A Study of Urban Bias in World Development*. (London: Temple Smith; Canberra, ACT: Australian National University Press, 1977).

⁴ World Bank, "World Development Indicators Database.", 2017.

(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.⁵

Trade focused CGE models presented in Robinson, El-Said and San⁶ (1998); Harris⁷ (2001); Lofgren *et al.*⁸ (2001) and Lofgren, El-Said and Robinson⁹ (2001) 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.

Coupled with an evaluation of general macroeconomic conditions across low and high food-deficit zones within ECO region¹⁰, it is evident that low food-deficit countries on average have much better performance in terms of indicators related to fiscal, trade, monetary

⁵ Leif Johansen, *A Multi-Sectoral Study of Economic Growth*. Amsterdam: North-Holland Pub. Co, 1960. Jan Sandee, *A Demonstration Planning Model for India* (Bombay: Asia Pub. House, 1960); Thomas W. Hertel, *Global Trade Analysis: Modeling and Applications* (Cambridge University Press, 1997); Wobst, Peter. "Structural adjustment and intersectoral shifts in Tanzania: a computable general equilibrium analysis" Vol. 117. International Food Policy Research Institute, Washington D.C., 2001. Henning T. Jensen, Sherman Robinson, and Finn Tarp. "General Equilibrium Measures of Agricultural Bias in Fifteen Developing Countries." *IFPRI, Trade, and Macroeconomics Discussion Paper*, no. 105, (2002).; Henning T. Jensen, and Finn Tarp. "Trade Liberalization and Spatial Inequality: A Methodological Innovation in a Vietnamese Perspective." *Review of Development Economics* 9, no.1 (2005): 69–86.; Peter B. Dixon, "Evidence-Based Trade Policy Decision Making in Australia and the Development of Computable General Equilibrium Modeling." Presented at the seminar on Building Institutions for Evidence Based Trade Policy Decision-Making: International Experience and Russian Strategy, London: October 26-27 2006.

⁶ Sherman Robinson, Moataz El-Said, and Nu Nu San. "Rice Policy, Trade, and Exchange Rate Changes in Indonesia: A General Equilibrium Analysis." *Journal of Asian Economics* 9, no.3 (1998): 393–423.

⁷ Rebecca Lee Harris, "A Computable General Equilibrium Analysis of Mexico's Agricultural Policy Reforms." *TMD Discussion Papers*. Washington D.C.: International Food Policy Research Institute (IFPRI), 2001.

⁸ Hans Lofgren, Osten Chulu, Oskey Sichinga, Franklin Simtowe, Hardwick Tchale, Ralph Teska, and Peter Wobst, "External Shocks and Domestic Poverty Alleviation: Simulations with a CGE Model of Malawi." *Trade and Macroeconomics Discussion Paper* (2001): 71.

⁹ Hans Lofgren, Moataz El-Said, and Sherman Robinson. "Trade Liberalisation and the Poor: A Dynamic Rural-Urban General Equilibrium Analysis of Morocco." In *Towards Arab and Euro-Med Regional Integration*, ed. Sébastien Dessus, Julia Devlin, and Raed Safadi, (Paris: OECD, 2001) 129-146

¹⁰ For detailed analysis of how macroeconomic structural constraints and the enabling policy environment have evolved within ECO region, see PIDE, "Economic Management Modeling in ECO Member Countries." Islamabad, Pakistan, 2019.

and financial policies and with less involvement of foreign countries in their economic policymaking.

In the context of fiscal policy, it is observed that the low-food deficit region has much more fiscal space than high food deficit region. This is evident from the lower tax to GDP ratio with a 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 (Figures 9.7 and 9.8). In terms of tax revenue (as a percentage 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).¹¹

There was much higher financial penetration in the high food-deficit zone but overtime this pattern has reversed in favor of low food-deficit zone (as evident from the evolution of broad money supply as a percentage of GDP). However, in comparison with other countries, overall financial penetration is quite low in the region.

Furthermore, not only is broad money as a percentage of GDP the lowest in Afghanistan, but so is private credit to GDP ratio (percent); 4 percent in contrast with 80 percent for Turkey, and 15.4 percent for Pakistan in 2015. The weakest country in the context of financial intermediation is Afghanistan which at some level can be attributed to the failure of Kabul Bank in 2010. Overall inflation in each country (except Iran) has remained in the single-digit as per 2015 values, and these patterns match key findings from PIDE 2019. However, inflationary pressures within the Iranian economy continued to fall under a less accommodative monetary policy stance (contractionary monetary policy), with the consumer price index falling to 13.7 percent in 2015, from a peak of 39.3 percent in 2013.¹²

Comparison of 1990 and 2015 benchmarks show that the low food deficit region is much more open to trade than the high food deficit region. Evidence of liberal trade policy can be assessed through the shares of export and import in world trade for each country. Overall the low food deficit region has relatively more open trade regimes than the high food deficit region.

¹¹ Information of Tax to GDP ratio is unavailable for Turkmenistan and Uzbekistan.

¹² PIDE, "Economic Management Modeling in ECO Member Countries." 2019.

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 9.7). However, in terms of external debt servicing as a 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 invariant in high food-deficit countries.

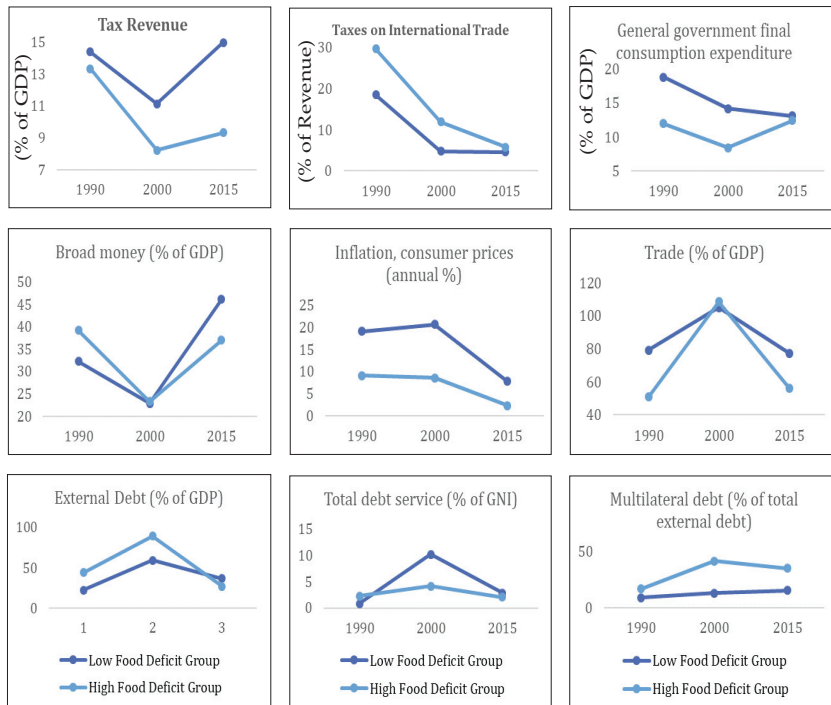


Figure 9.7. Profile of Macroeconomic Conditions and Policy Environment -1

Note: Data tables corresponding to these graphs are available from the authors on request

Source: World Bank. "World Development Indicators Database." 2017; PIDE, "Economic Management Modeling in ECO Member Countries." 2019.

However, the low food-deficit countries show a declining trend in debt in subsequent years, but the rate of decline in debt is higher 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 9.8). High food-deficit countries particularly Afghanistan and Pakistan are more vulnerable: not only they have a much higher dependence on aid, but they also have weaker macroeconomic indicators of FDI, capital formation, and GDP per capita, coupled with much higher levels of poverty (Figure 9.9).

In conclusion, the low food-deficit countries exhibit greater macroeconomic stability and a more consistent economic policy environment as compared to high food-deficit countries (Figure 9.10).

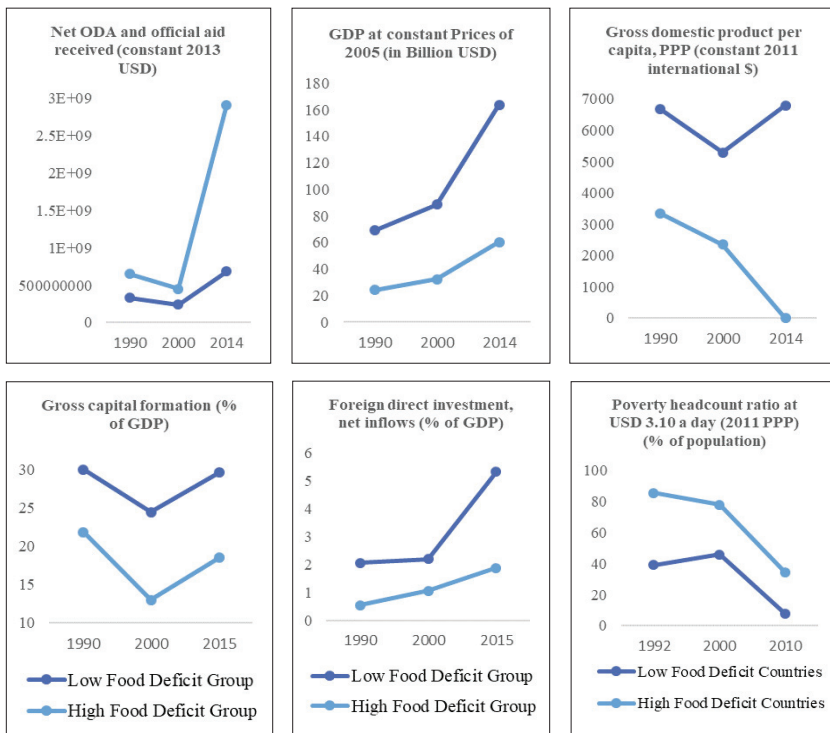


Figure 9.8. Profile of Macroeconomic Conditions and Policy Environment -2

Note: Data tables corresponding to these graphs are available from the authors on request

Source: World Bank, "World Development Indicators Database." 2017.

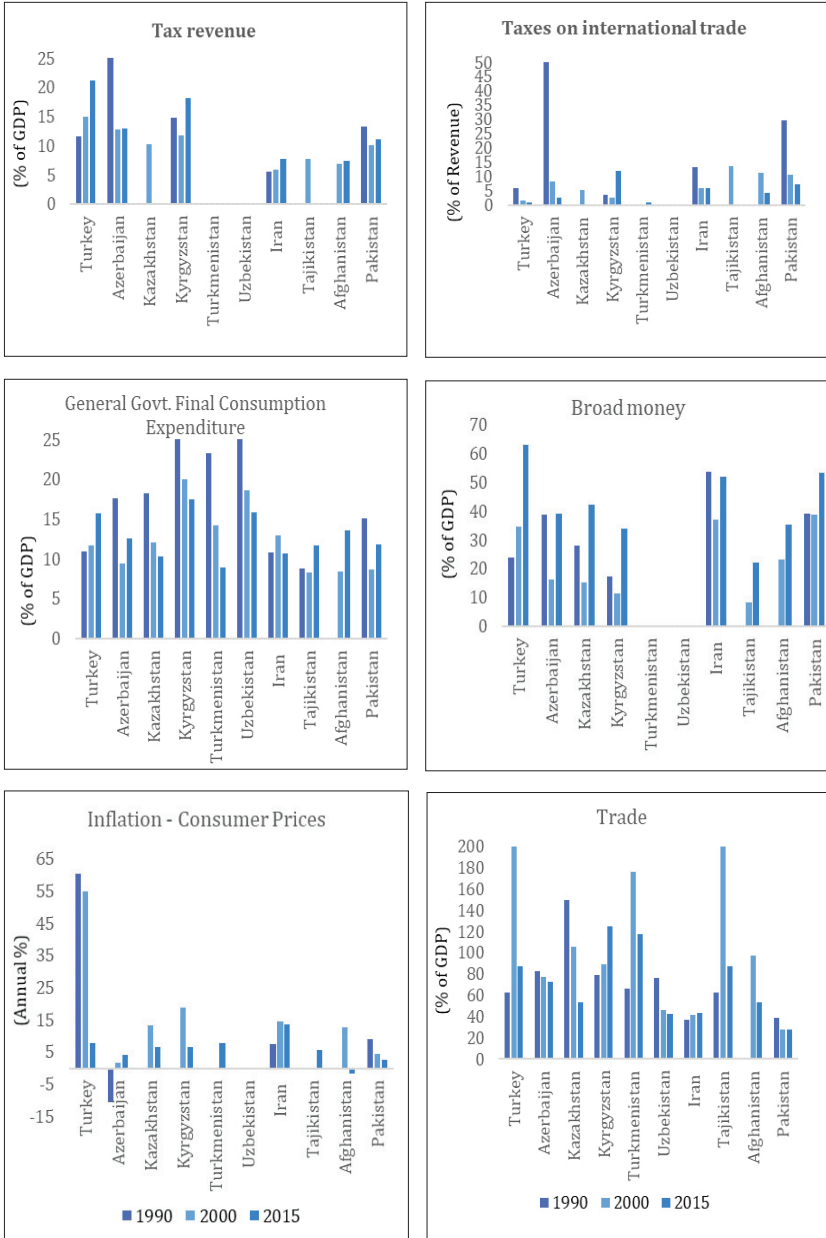


Figure 9.9. Regional Macroeconomic Profile and Policy Environment-1

Note: Data tables corresponding to these graphs are available from the authors on request

Source: World Bank. "World Development Indicators Database." 2017.

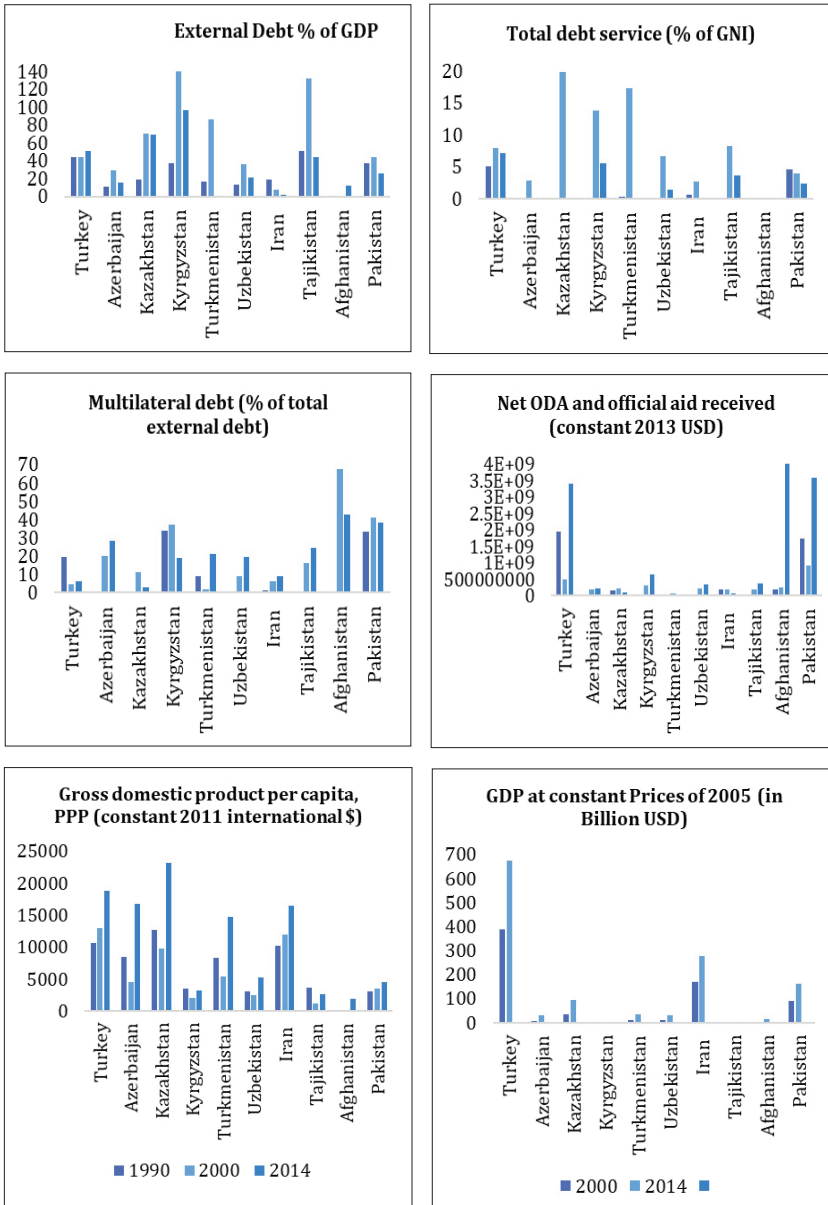


Figure 9.10. Regional Macroeconomic Profile and Policy Environment -2

Note: Data tables corresponding to these graphs are available from the authors on request

Source: World Bank. "World Development Indicators Database." 2017; PIDE, "Economic Management Modeling in ECO Member Countries." 2019.

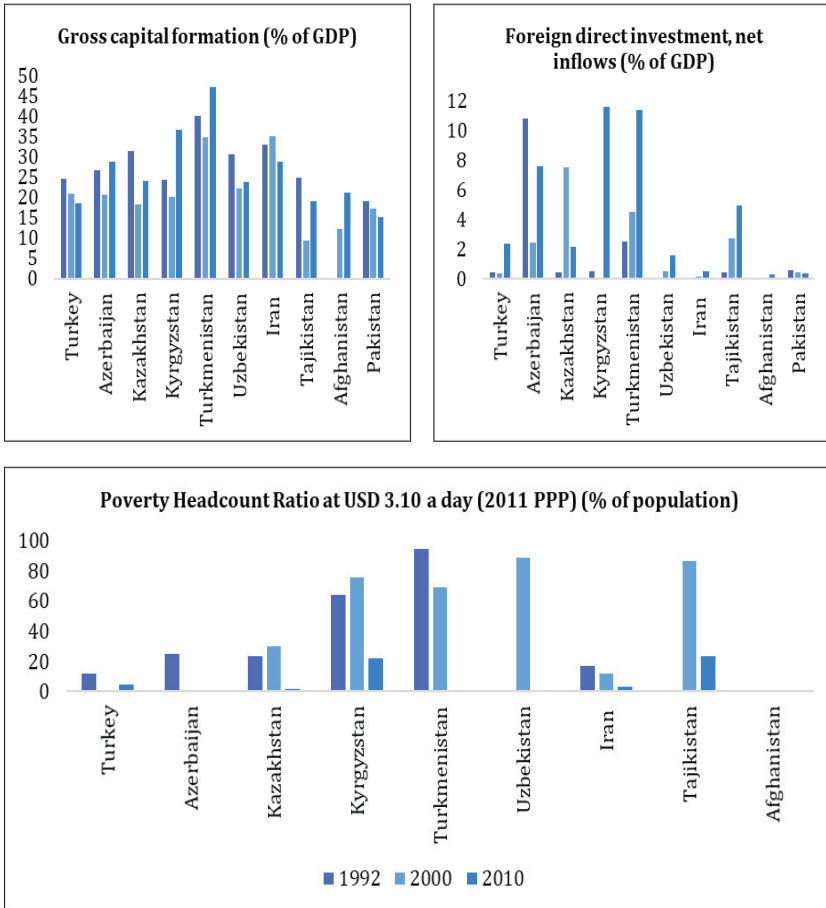


Figure 9.11. Regional Macroeconomic Profile and Policy Environment -3

Note: Data tables corresponding to these graphs are available from the authors on request

Source: World Bank. "World Development Indicators Database." 2017.

3.1.3. Varied Extent of Agricultural Dependence

High food deficit ECO countries are substantially more dependent on agriculture than low food deficit countries. This can be inferred by the much greater share of agriculture value-added in GDP, the correspondingly lower share of industrial output, as well as the greater concentration of population in rural areas, and the larger proportion of the population dependent on the agriculture sector for employment in these countries (Figures 9.12 and 9.13).

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 higher for both rural and urban populations. Among the three high food-deficit countries Afghanistan is showing the highest poverty levels both in the context of the rural and urban population likely as a result of economic and political turmoil. Poverty is centered in the rural population in a much higher proportion in the high deficit countries (Figures 9.12, 9.13, and 9.14).

This does not undermine the agrarian economies, rather shows that the high food-deficit zone within the region is at a lower level of overall development than the remaining countries. Analysis of macroeconomic trends suggests some structural pathways that put these countries on a relatively 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, 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. This suggests that the agriculture sector and rural development are an important piece of the puzzle to ensure an economy is in a hunger-free domain.

Low food-deficit countries performed better in terms of eradicating and also in terms of the overall performance of the agricultural sector as well as indicators related to the overall macroeconomic structure of the economy. The macroeconomic structure of the economies suggests that not only were the policies followed by these countries centered on hunger elimination through pro-poor strategies but that such a goal was achieved with well-rounded and comprehensive structural programs.

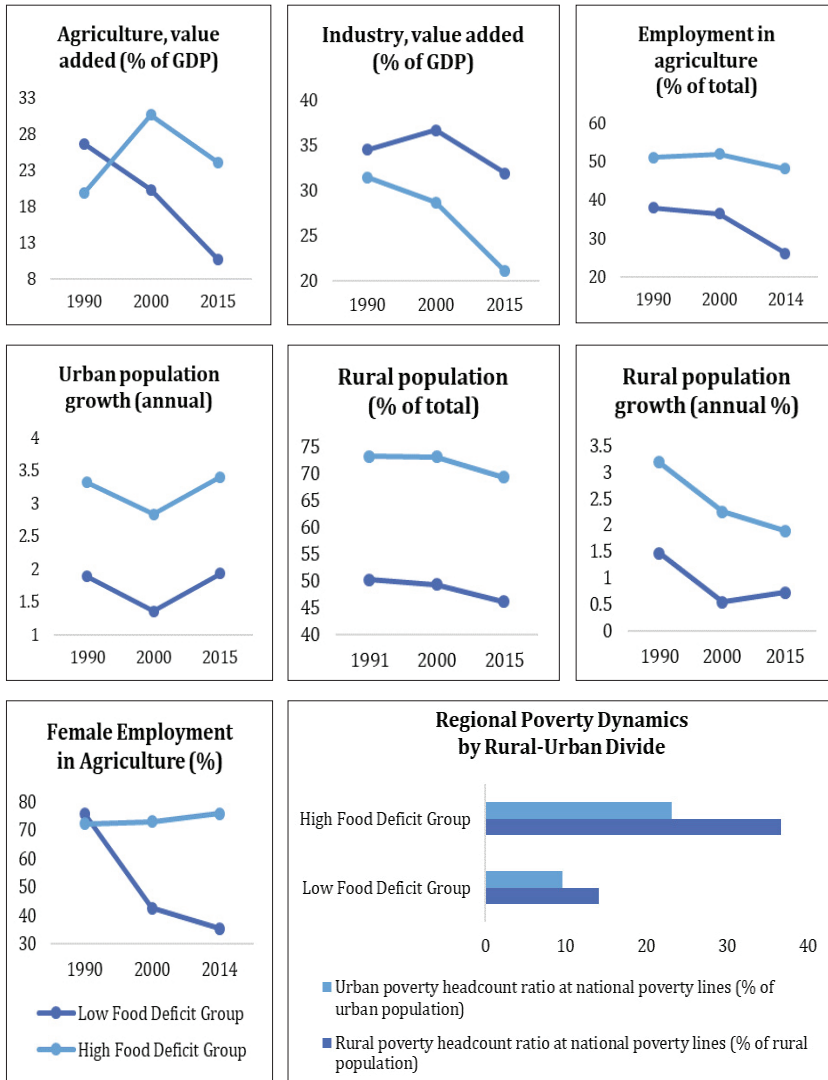


Figure 9.12. Agricultural Dependence, Regional Poverty and Demographic Dynamics -1

Note: Data tables corresponding to these graphs are available from the authors on request.



Figure 9.13. Agricultural Dependence, Regional Poverty and Demographic Dynamics -2

Note: Data tables corresponding to these graphs are available from the authors on request.

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. Therefore, agricultural and rural development is an important locus in the fight against undernourishment but in this process, the feedback loop between agricultural productivity and overall economic environment should not be ignored.

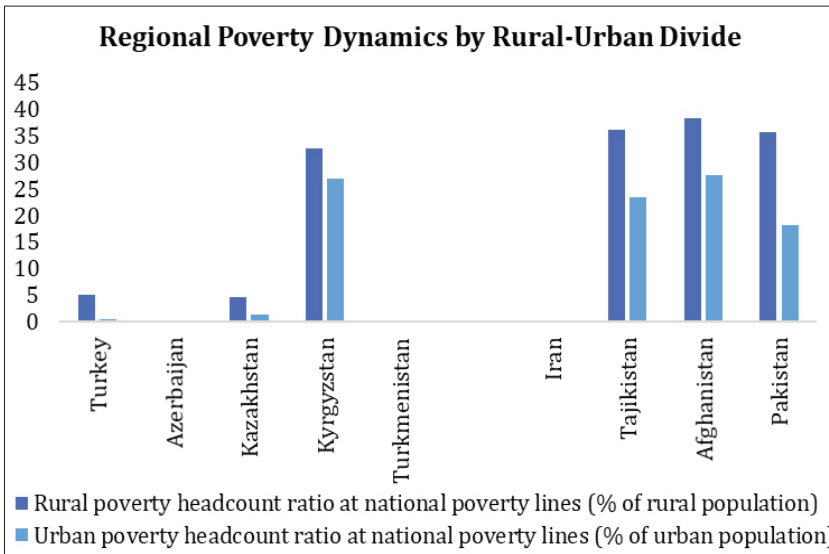
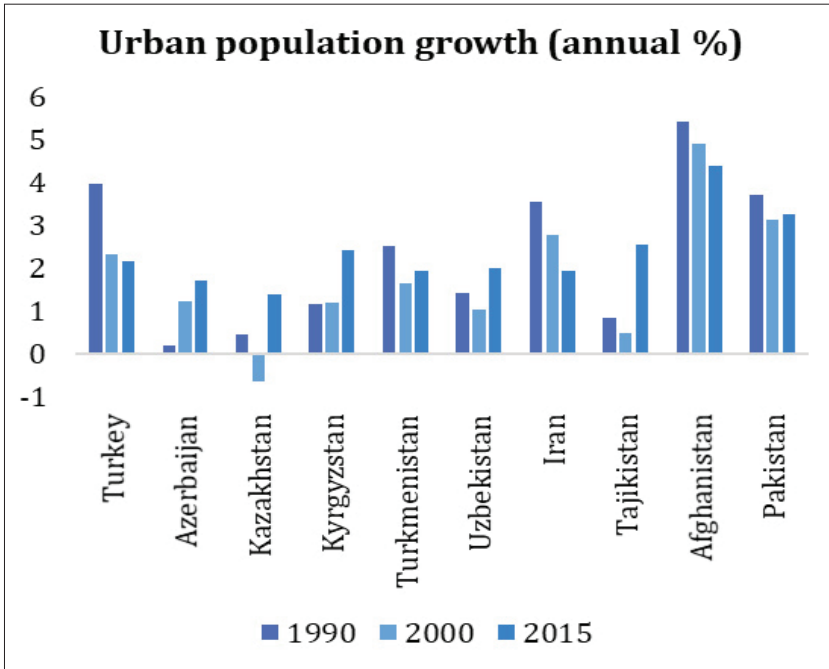


Figure 9.14. Agricultural Dependence, Regional Poverty and Demographic Dynamics -3

Note: Data tables corresponding to these graphs are available from the authors on request.

3.2. Agriculture Production and Trading Patterns

A critical policy debate in food security concerns self-sufficiency in staple food versus diversification into high value non-staple agricultural produce. Linked with this debate is the question of how capable a region or country is in reaping the benefits of increased demand (foreign and domestic) for animal protein.

This policy question can be answered by first identifying the food categories in which a country or region has a production advantage, and then tracing production and trade patterns in food items. This will be followed by an assessment of the potential of each country in the production and trade of animal protein products.

There is evidence of growth in all food categories in both low and high food-deficit groups in the post-2000 period (Figures 9.15, 9.16, and 9.17). 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 the fruits and vegetable category and a clear comparative advantage of the low food-deficit group in the production of livestock, milk, and vegetable oil products, and a slight advantage in meats. However, these patterns are aggregations and may overshadow country-specific variations.

A disaggregated analysis of level and growth patterns of cereal production country-wise shows that all three high food deficit countries are contributing a substantial amount in terms of the 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.

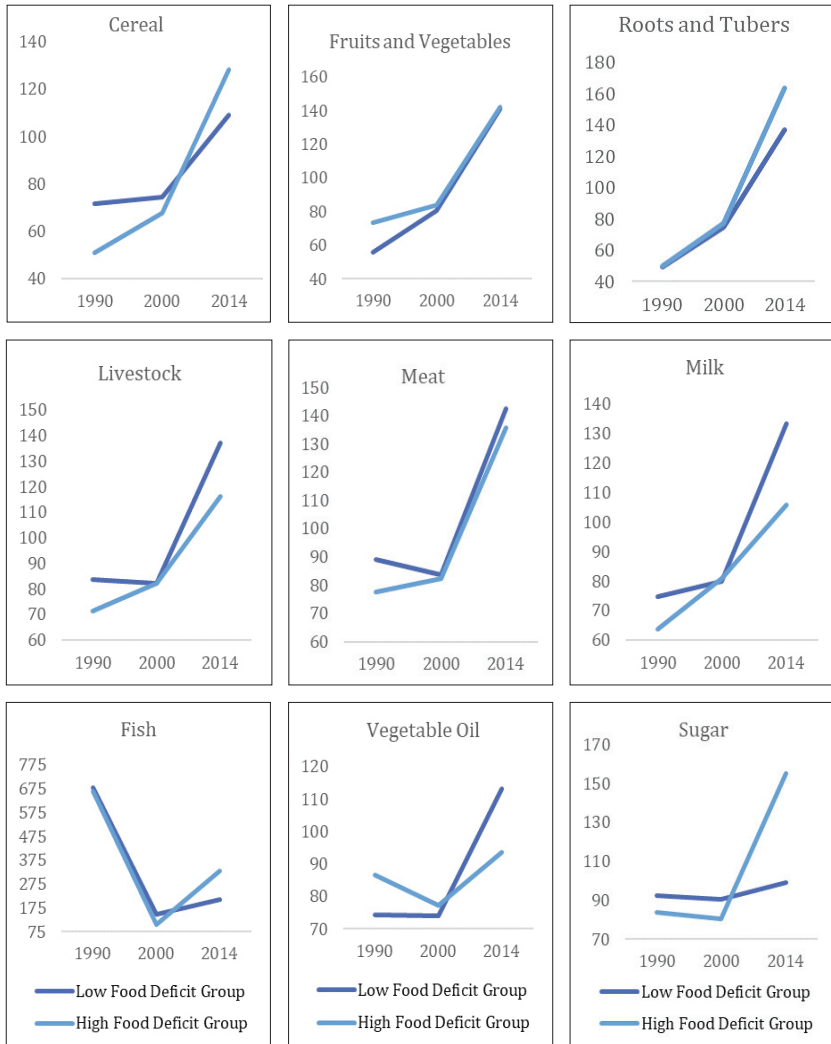


Figure 9.15. Production Indices of Food Groups across Food Deficit Regions

Note: Dark Blue and Light Blue lines indicate the average for low and high food-deficit regions respectively. Figures are based on production indices with the base year 2004-06. Data tables corresponding to these graphs are available from the authors on request.

Source: FAO. "Statistical Yearbooks." 2015; FAO, "FAOSTAT." 2017.

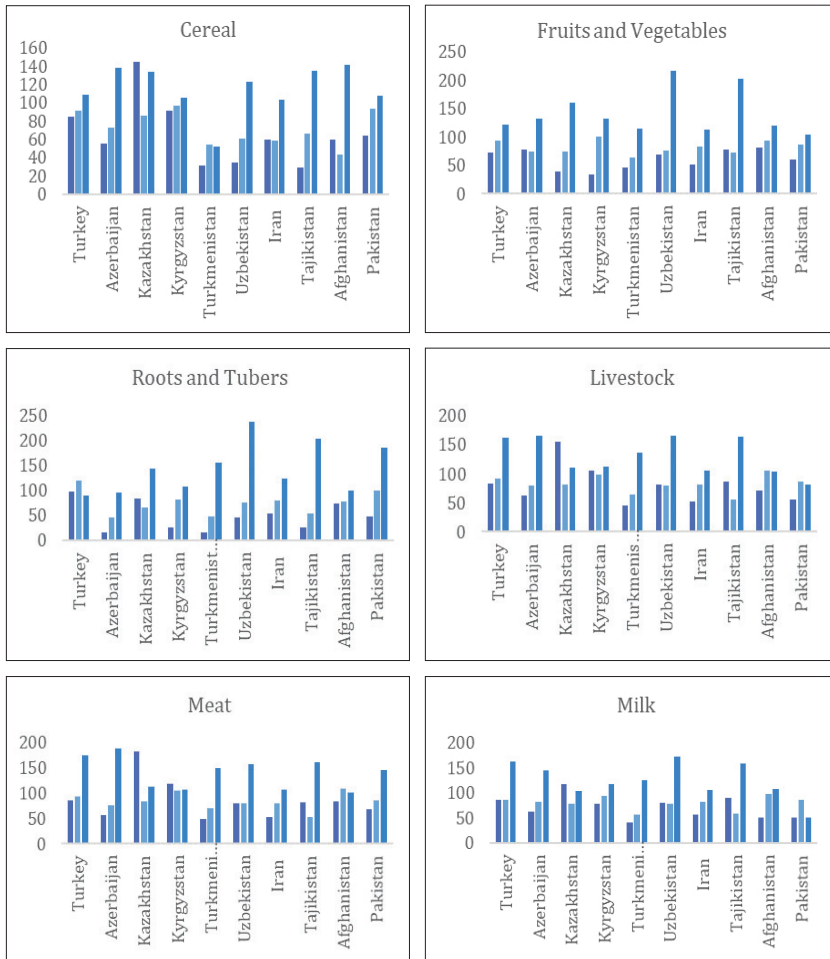


Figure 9.16. Country-wise Food Group Production Indices -1

Note: Dark blue, light blue and indigo bars represent estimates for the years 1990, 2000, and 2014 respectively. Figures are based on production indices with the base year 2004-06. Data tables corresponding to these graphs are available from the authors on request.

Source: FAO. "Statistical Yearbooks." 2015; FAO, "FAOSTAT." 2017.

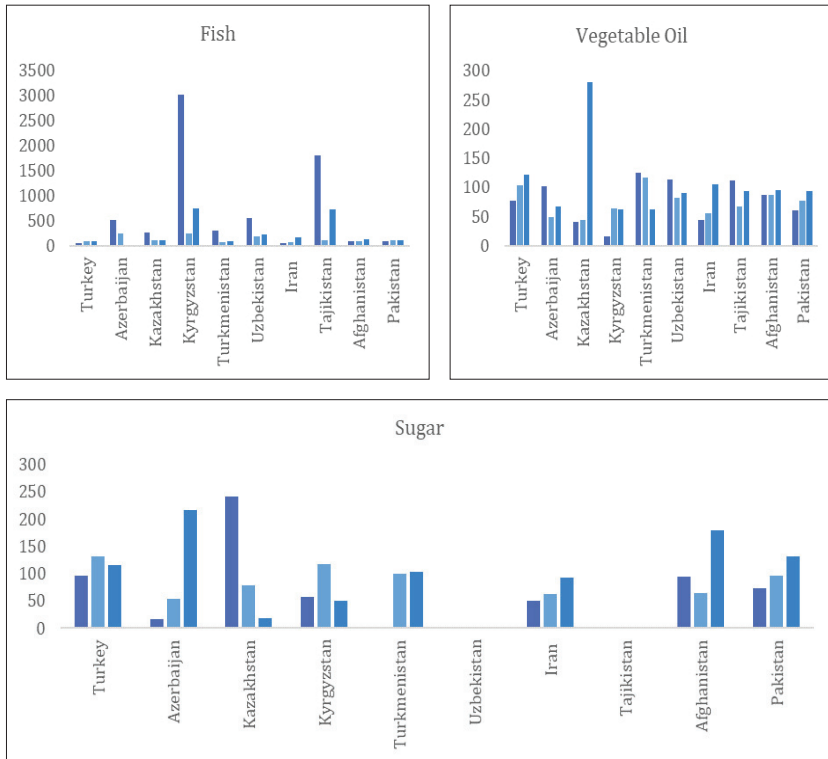


Figure 9.17. Country-wise Food Group Production Indices -2

Note: Bars represent estimates for the years 1990, 2000, and 2014 respectively. Figures are based on production indices with the base year 2004-06. Data tables corresponding to these graphs are available from the authors on request.

Source: FAO. “Statistical Yearbooks.” 2015; FAO, “FAOSTAT.” 2017.

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. This suggests that aggregation has downplayed this clear strong tendency for cereal production in the six low food-deficit countries due to low output in Turkmenistan. Overall, the region has devoted substantial resources to the production of cereal crops and this is evident in positive trends in growth since 2000.

There is a positive trend in the output of fruits and vegetables in all countries between the period 2000 to 2014. Uzbekistan and Tajikistan have a clear advantage over other countries, while Kazakhstan has a slight advantage over the other countries for the same time period. Among the remaining countries, Pakistan has the lowest production index (104), and Turkey the highest (121).

The high food-deficit group has a relatively higher growth trend for roots and tubers, which is primarily on account of the substantial boost in production in Tajikistan and Pakistan. However, though the low food-deficit group has a slightly lower magnitude on average¹³, countries within this group exhibited large variations in production. Iran, Kazakhstan, and Turkmenistan are close to the regional average, while Uzbekistan has the highest level of production in 2014, and Turkey the lowest.

All countries in the low food-deficit group have an advantage in livestock production, however, the countries with the most promising growth are Azerbaijan, Uzbekistan, Turkmenistan, and Turkey. Among countries in the high food deficit region, quantity and growth of production in Tajikistan has increased for the period 2000 to 2014. On the other hand, while Afghanistan and Pakistan had growth within the period 1990 to 2000, a declining trend in growth rate can be observed subsequently. Considering these production levels in conjunction with patterns in meat production, a decreasing trend is evident in Afghanistan after 2000, while there is substantial growth in Pakistan. Thus, Pakistan is likely to remain unaffected in the context of meat production. While the region is responding to changing patterns in demand for animal protein, the degree of self-sufficiency will depend on the extent of the country's 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. 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.

In conclusion, all countries (with the exception of a few anomalies) are investing in their food base to secure adequate domestic food

¹³ Low food deficit zone (2014 estimates) produced less than high food deficit zone in production of roots and tubers with average values of 136.8 and 163.6 respectively.

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.

3.3. Self-sufficiency and Diversification Policy

To assess which food-deficit group is following a food independence policy, 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 follows a policy of food diversification by relying on global markets for fulfilling cereal requirements and developing their capabilities as suppliers of fruits and vegetables. Reverse patterns are observed in the case of the high food-deficit group, with constant decreasing trends in net trade for the fruits and vegetables and increasing trends for cereals. Country-wise patterns 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 vegetables. In the remaining two high food-deficit countries, Afghanistan and Tajikistan, there is a reliance on global markets in recent years for securing the cereal requirements of their populations along with a marginal trade surplus (Afghanistan) and a marginal trade deficit (Tajikistan) in fruits and vegetable production. These patterns are contrary to the average behavior observed for the high food-deficit group, suggesting trends in Pakistan are overshadowing the others.

In the case of the low food-deficit group, the countries which are showing clear signs of a policy of diversification into fruits and vegetable are Iran and Turkey, with Turkey being secure in terms of cereal production, as well with a small trade surplus in cereal in 2014 and Iran relying on cereal imports to fulfill its staple food needs. However, both these countries have a positive trade surplus in fruits and vegetables 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 9.18.) 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.

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. 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 (Figure 9.19).

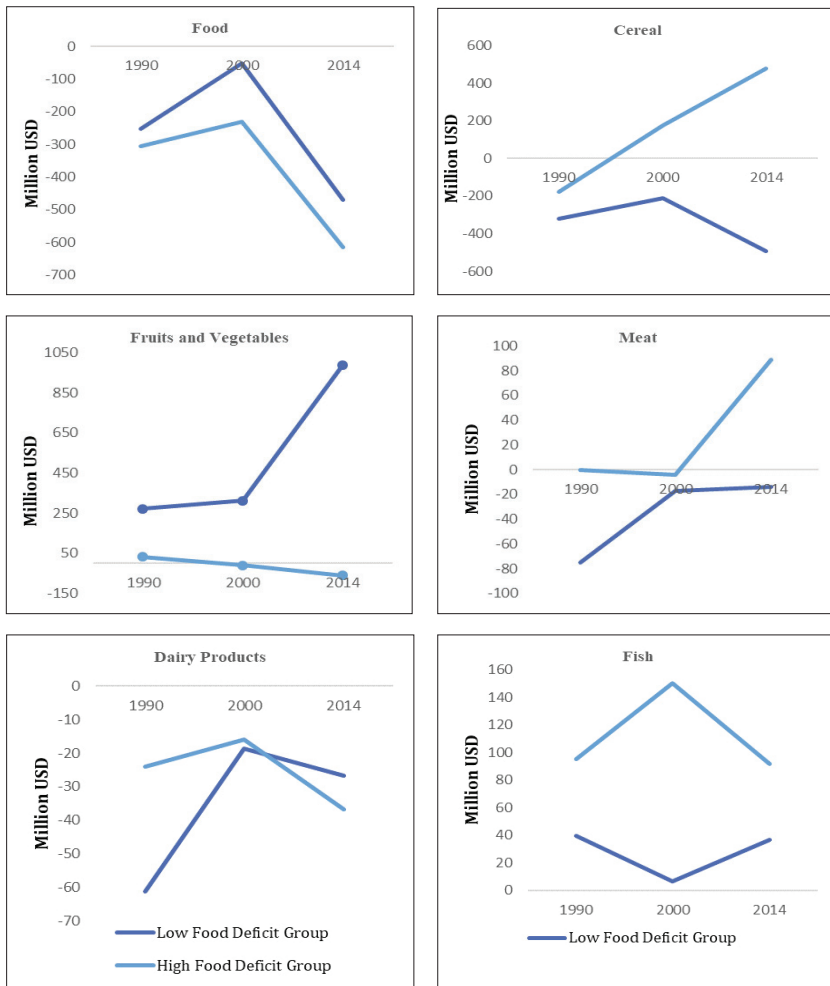
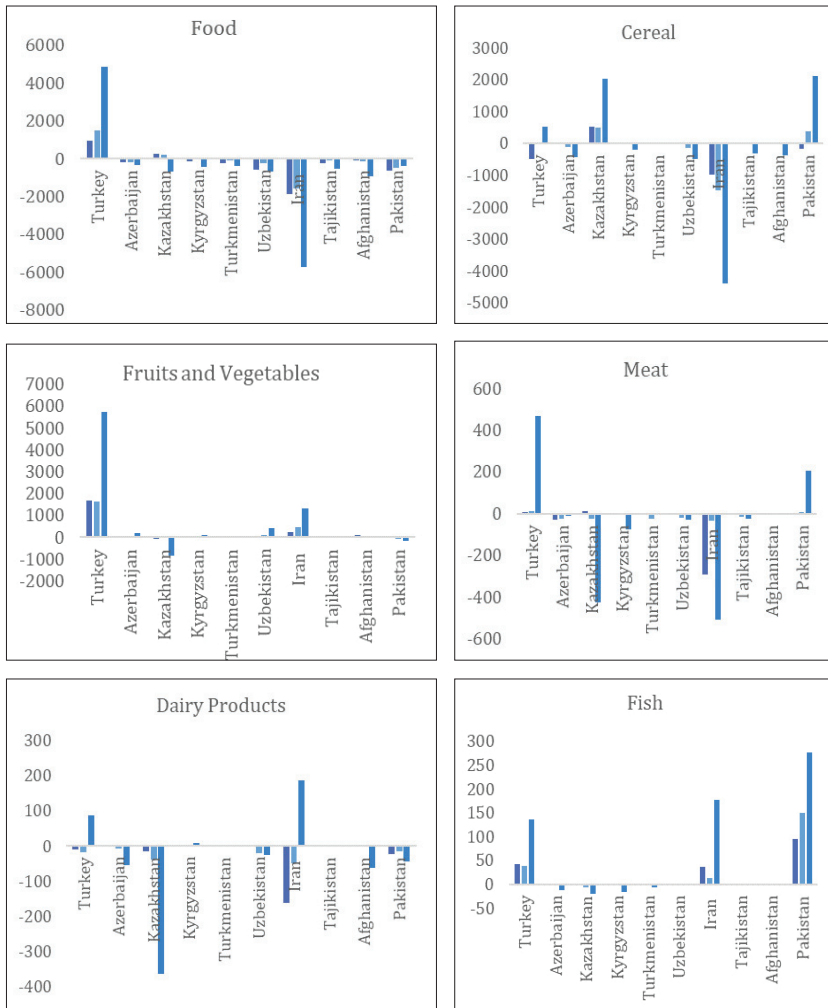


Figure 9.18. Net Trade of Food Groups Across Food Deficit Regions

Note: Data tables corresponding to these graphs are available from the authors on request

Source: FAO, "FAOSTAT." 2017.

Figure 9.19. Country-wise Net Trade of Different Food Groups



Note: Data tables corresponding to these graphs are available from the authors on request.

Source: FAO, "FAOSTAT." 2017.

At an aggregate level, there is a clear advantage of high food deficit region in meat and fish production with a positive and substantial higher trade surplus in these products for the years 1990, 2000, and 2014, while there is a trade deficit in dairy products for both low and high food-deficit groups, though the extent is less for the

low food-deficit group in 2014. At a disaggregated level, the only country that is food secure is Turkey which has a trade surplus in all three categories of meat, fish, and dairy products so not only it is meeting its national requirements, but it is also exporting to other countries. 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. There is 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 local demand) therefore the possibility of exporting is moot.

4. Regional Collaboration

It is evident that the region is facing a double burden concerning nourishment: countries that have met MDG targets for reducing undernourishment are now facing the burden of over-nourishment with evidence of children suffering from obesity. On the other hand, high food-deficit countries are struggling with undernourishment and its impact on chronic forms such as stunted, underweight, and wasted growth in children under age five. At the regional level, different policy responses may be required to achieve food security given the different structures of the problem within the region (in low and high food-deficit regions). However, there are more commonalities in both these regions given the sustainability of the process that helped low food-deficit countries to reduce hunger.¹⁴ In terms of collaborative action within the ECO region, there are many common themes that can benefit both sets of countries irrespective of what structure of food insecurity they are facing.

4.1. Nutrition-Sensitive Health Policy

The emerging evidence of over-nourishment and obesity within low food-deficit ECO countries suggests this is due in part to lifestyle

¹⁴ 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. Low food deficit countries still face the problem of sustaining their food secure status. Their policy challenge is no different from high food deficit ECO countries. The key hurdle for is not only elimination of hunger but also sustainability of hunger reduction process – answer to which lie in identification of structural factors inhibiting food security.

changes that come as part of development; a greater preference for animal protein and processed foods in one's diet and a sedentary way of living. Even in the high food-deficit countries, greater tendencies for the demand for animal protein are emerging. Hence there is a need to develop a nutrition-sensitive health policy both in the context of dealing with the issue of under and over nourishment both at the macro level and grass-root micro level.

Some steps in this direction can include awareness campaigns for a more balanced diet preference with a healthy mix of vegetables and protein (both animal and non-animal sources), food quality insurance mechanisms, and the creation of opportunities for greater physical activities and exercise. In this context, investments need to be made, media campaigns along with school awareness programs can be instituted along with conditional health grants to school-going children to support the nutritional needs of poor children. Targeted health subsidies for the general population can be put in place to shape people's attitudes towards healthy choices. Structural level projects that assure there are enough open spaces such as parks, sports facilities along with institutionalized monitoring the quality content of food on market shelves will ensure people have access to healthy life choices at affordable rates.

4.2. Promotion of Rural Economy and Agricultural Sector Development

Promotion of rural economy is extremely important for the elimination of hunger from the region as not only rural livelihood is directly associated with the supply of food and its availability for the whole population but also because the locus of poverty within the high food deficit region is primarily in the rural economy. Strengthening of both farm and non-farm rural activities is crucial to ensuring food availability and to enhancing income levels and livelihood of the rural poor who are most vulnerable to hunger.

There is evidence that agricultural sector development is a key ingredient in ensuring a well-rounded growth process that can put a country on the path of sustainable development. This is because agricultural growth not only caters to the rural farm and non-farm economy but, through defining a country's food supply base and its position in the context of agricultural trade balance and linkages with the industrial sector, helps in macroeconomic performance. This is evident from the experience of countries in the

low food deficit region. Therefore, policies to strengthen the rural economy are extremely important and present a rich opportunity for collaborative action across various ECO countries.

One area in this context is agricultural productivity and water productivity per worker enhancements even with relatively weaker agricultural endowments. In this context, high yield varieties of seeds and improvement of agricultural technologies can be important factors for improving productivity. Similarly, there is a need to strengthen the link between urban markets and rural produce through the provision of more affordable, energy-conserving, and effective cold storage facilities, modern agricultural machinery, improved agricultural land markets, and government incentive schemes that ensure the efficient structure of land tenure.

Furthermore, there is a need for institutional processes to match agricultural productivity with farm size as per efficiency criterion, more efficient use of groundwater, 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 countries on how to improve agricultural productivity both in terms of collaborative research and on-ground implementation through medium and long-term action plans can be extremely fruitful.

4.3. Diversity across ECO Countries Serves as a Promising Opportunity

Diversity across ECO countries in their resource endowments offers an excellent opportunity for collaborative action. Not only is the region home to countries that are rich in resources such as gold, oil and gas reserves, coal, uranium, precious metals, aluminum but it also includes countries that have a strong agricultural and industrialized base.¹⁵

Through the promotion of regional trade in various commodities with comparative advantage, a strong environment of regional cooperation can be created where the transfer of technology (for agricultural and industrial development), improvement of skill sets of human resources. This cooperation of environment can act as a

¹⁵ PIDE, "Economic Management Modeling in ECO Member Countries." 2019.

strong buffer for each other in case of crisis. The net oil importers such as Turkey and Pakistan can greatly benefit from oil exports of oil-producing countries, while cereal dependent oil-producing countries can import cereals from the region to meet food security needs.

Keeping country-specific interests intact while engaging in regional cooperation through trade as per each country's comparative advantage can greatly augment regional macroeconomic stability as well as food security concerns. Such cooperation does not just extend to a regional trade agreement in agricultural products and oil trade but also presents an opportunity for the development of the country's industrial sectors. Though the manufacturing sector has shown expansion in almost all countries, it lacks diversification in most of the economies.¹⁶

The need for a diversified base within the economy offers an area where countries can support each other through the exchange of knowledge and technology transfers and this can boost the regional economy and engender poverty and hunger reduction processes.

4.4. Structural Divisions as Per SDG Targets

Structural divisions along various lines (gender, rural and urban, macroeconomic and political stability, and ability to protect the population from climatic shocks) are important factors affecting the food security of the entire population. Awareness campaigns along with institutionalized measures that help in reducing gender imbalances and rural and urban disconnect along with the study of preventive measures against extreme climate changes¹⁷ within the region can yield important lessons for countries.

5. Conclusion

Ensuring food security is a serious challenge for developing countries including some ECO member states. About 780 million people, or 98 percent of the total undernourished population, live in

¹⁶ 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. (See PIDE, "Economic Management Modeling in ECO Member Countries." 2019.)

¹⁷ i.e. extreme temperatures, droughts, floods and environmental damage.

the developing regions. In the ECO region, 30 percent of Tajikistan's population is undernourished compared with an average of 13 percent in other developing countries at a similar level of development. 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 the analysis of various dimensions of food security, we find that high food inadequacy within these countries is not a problem of food availability but food access. Looking deeper into country-specific temporal patterns within the high food deficit region, we can see that Pakistan holds the largest size of the undernourished population with Afghanistan and Tajikistan at the respective second and third position but in terms of the prevalence rate of undernourishment, Tajikistan tops the list followed by Afghanistan and Pakistan. Hence there is a varying degree in which the problem of food deficiency manifests itself within the high food-deficit countries.

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

The agriculture sector has been found to be more productive in low food deficit countries than in countries that 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 the 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 the context of Afghanistan and Pakistan - the two high food-deficit countries that have substantially high population growth rates coupled with rising proportions of the 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 the fight against undernourishment but in this process, the link across agricultural productivity to the 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 the upward trend in these food groups within the period 2000-14 for most ECO countries. Hence overall food production is growing

within the 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 a 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 the production and net trade indicator for meat, fish, and dairy products for each ECO country it has been observed that there is 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.

This study has provided a comparative perspective on the 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 products can be an important factor in ensuring adequate availability of food. A review of the 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 the potential for cooperation among the ECO member countries to ensure food security for their citizens.

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