

# Vulnerability in Food Supply and Food Access – Evidence from ECO Region

*Madeeha Gohar Qureshi, Dr. Saud Ahmed Khan, Dr. Usman Qadir, Dr. Musleh-ud Din and Dr. Ejaz Ghani*



# Key Objectives

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Identification of internal policy stance within each ECO countries in terms of how to cater to their important food requirements

- Policy of Food Independence versus Policy of Food Diversification
- Building capacity to fulfil local and international rising demand for animal protein

Assessment of Vulnerability to International Price Shocks

- Most prominent international price shocks post 2000 are rise in food price in 2007-08 and 2010-11, decrease in oil prices in 2015



## Importance of Food Independence versus Crop Diversification Policy within Agricultural Policy Making Paradigms

### Productionist View

- Traditionalist stress on self-sufficiency policy as tool to ensure food availability
- International Policy Think-Tanks post 2000 has advocated policy of crop diversification into cash crops both as measure of food availability but also enhancement of Food Access for poor farmer

### Market Led View

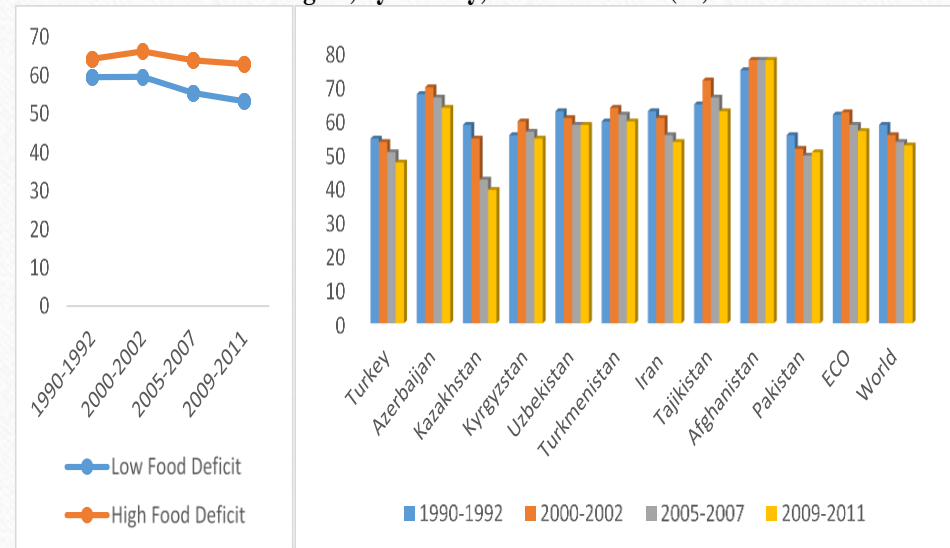
- Market based outcome
- Conflict of efficiency and equity
- Role of government as regulatory body

### Developmentalist View

- Deals with Sustainable development goals and combines elements of all four dimensions of food security namely food availability, food access, food stability, and food utilization whereby stress has been on agricultural led growth.

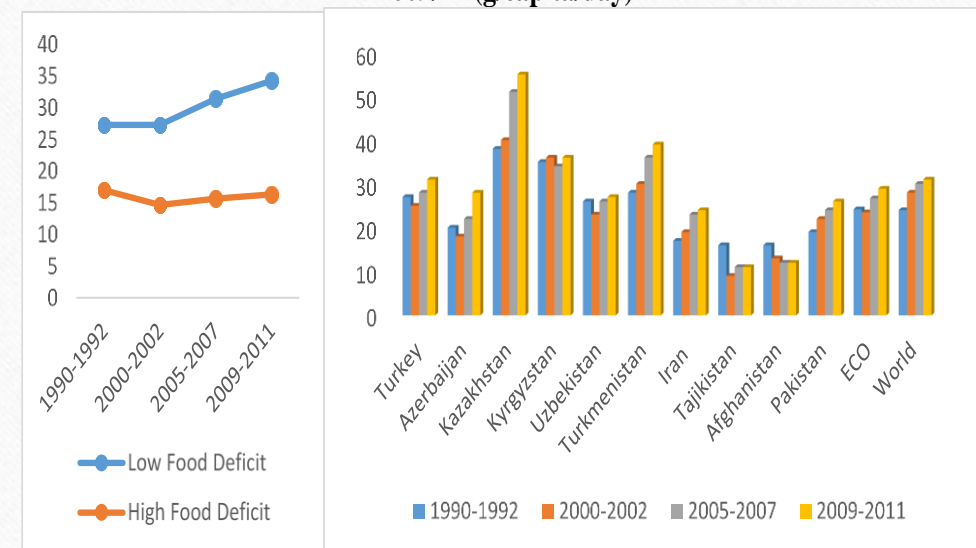
# Shift in Consumer Preferences for Dietary Calories from Staple Food toward Animal Protein

**Figure 1: Share of dietary energy supply derived from cereals, roots and tubers in ECO Region, by country, 1990/92-2009/11(%)**



Data Source: FAOSTAT

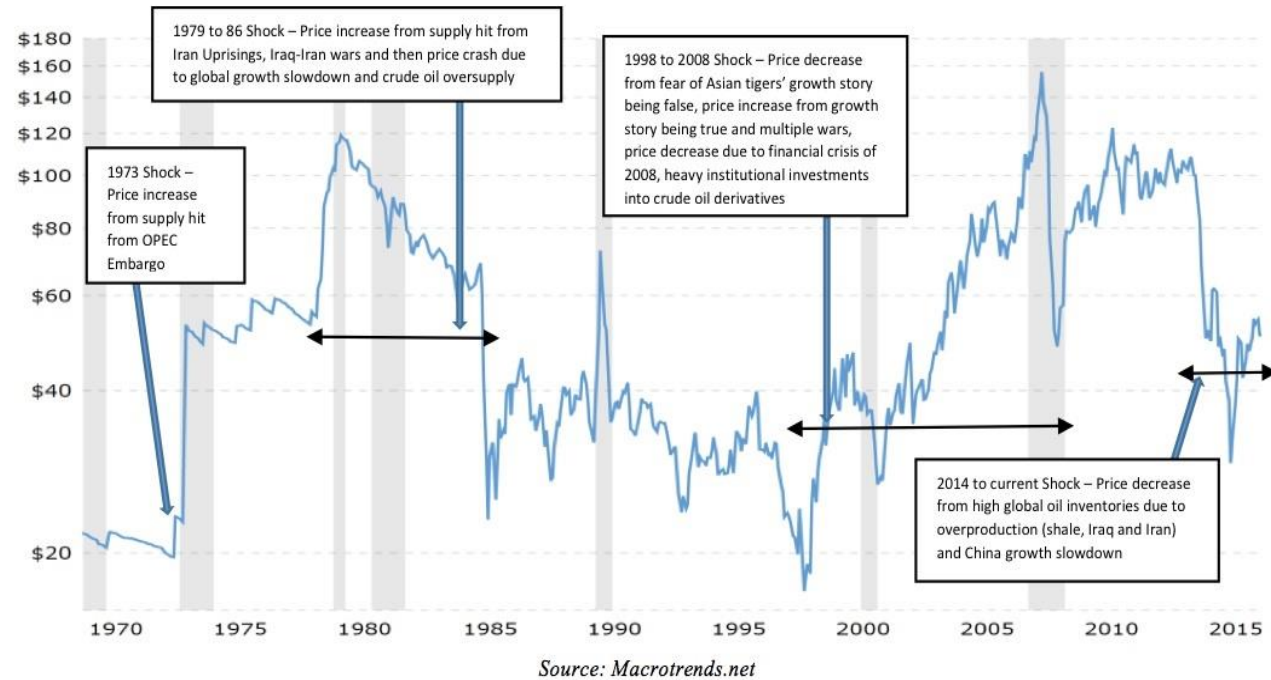
**Figure 2: Average supply of protein of animal origin in ECO Region, by country, 1990/92-2009/11 (g/capita/day)**



Data Source: FAOSTAT



# International Price Shocks – Two Important Sources



## Data Limitations

- Firstly we have data on food prices for only three countries that is Turkey, Iran and Pakistan and that only for merely fifteen time periods that is from 2000 to 2014.
- Secondly data on food prices is only available at aggregate level even within Turkey, Iran and Pakistan





## Empirical Methodology

- For crop diversification and self-sufficiency debate, we will compare net trade patterns in two primarily food items namely staple food group and cash crop group
- For catering to local and international demand for animal protein, we will compare net trade patterns in two primarily food items namely meat and fish products



# Empirical Methodology

Assessment of Vulnerability will take place at two levels:

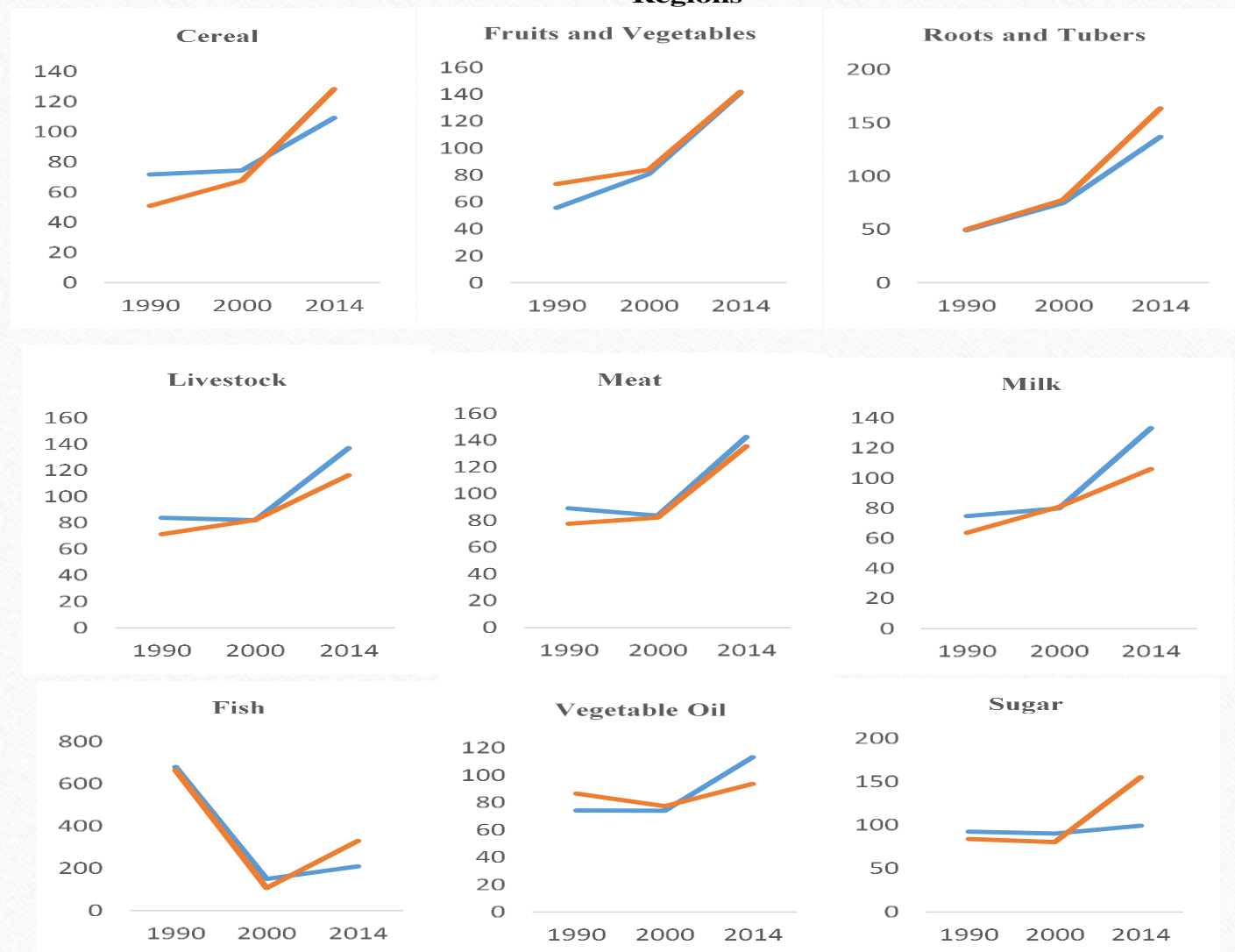
- Assessment of Price and Inflation series ((both actual and forecasted series)
- Assessment through different indicators of stability dimension of Food security using following key variables

Indicators	Data Source	Food Insecurity Dimension As Per FAO Definition
Cereal Import Dependency Ratio (%)	FAO	Stability
Gross International Reserves (Million US\$)	IMF, ADB, WDI	Stability
Value of food imports over total merchandise exports (%) (3-year average)	FAO	Stability





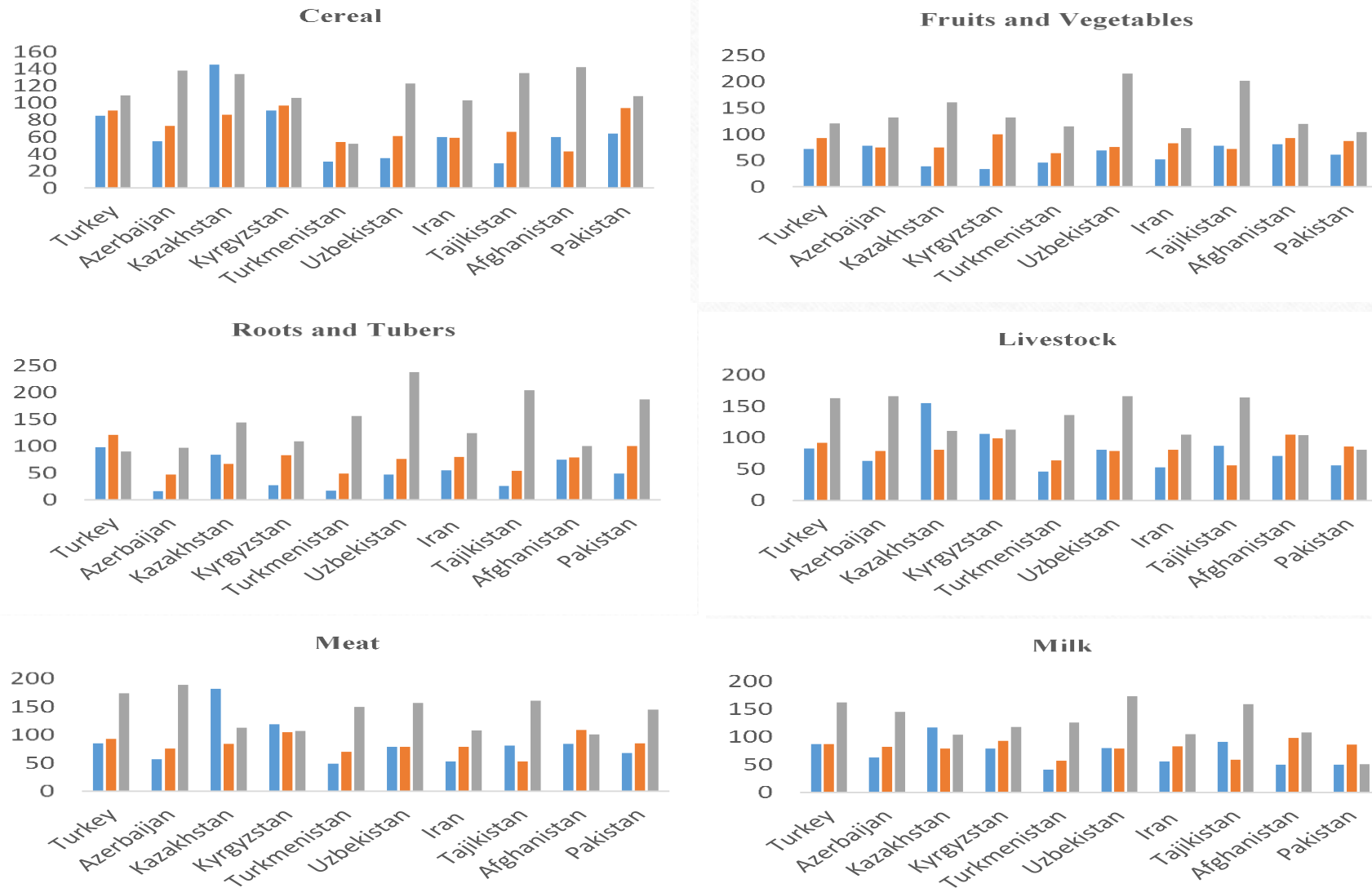
**Figure 3a: Production Indices for Different Food Groups across Low and High Food Deficit ECO Regions**



*Note: Blue and Red lines indicate average for low and high food deficit regions respectively; These figure are based on production indices with base 2004-06 = 100*

*Source: FAO Yearbook 2015, FAOSTAT*

**Figure 3b: Production Indices for Different Food Groups in ECO Region (Country-wise)**

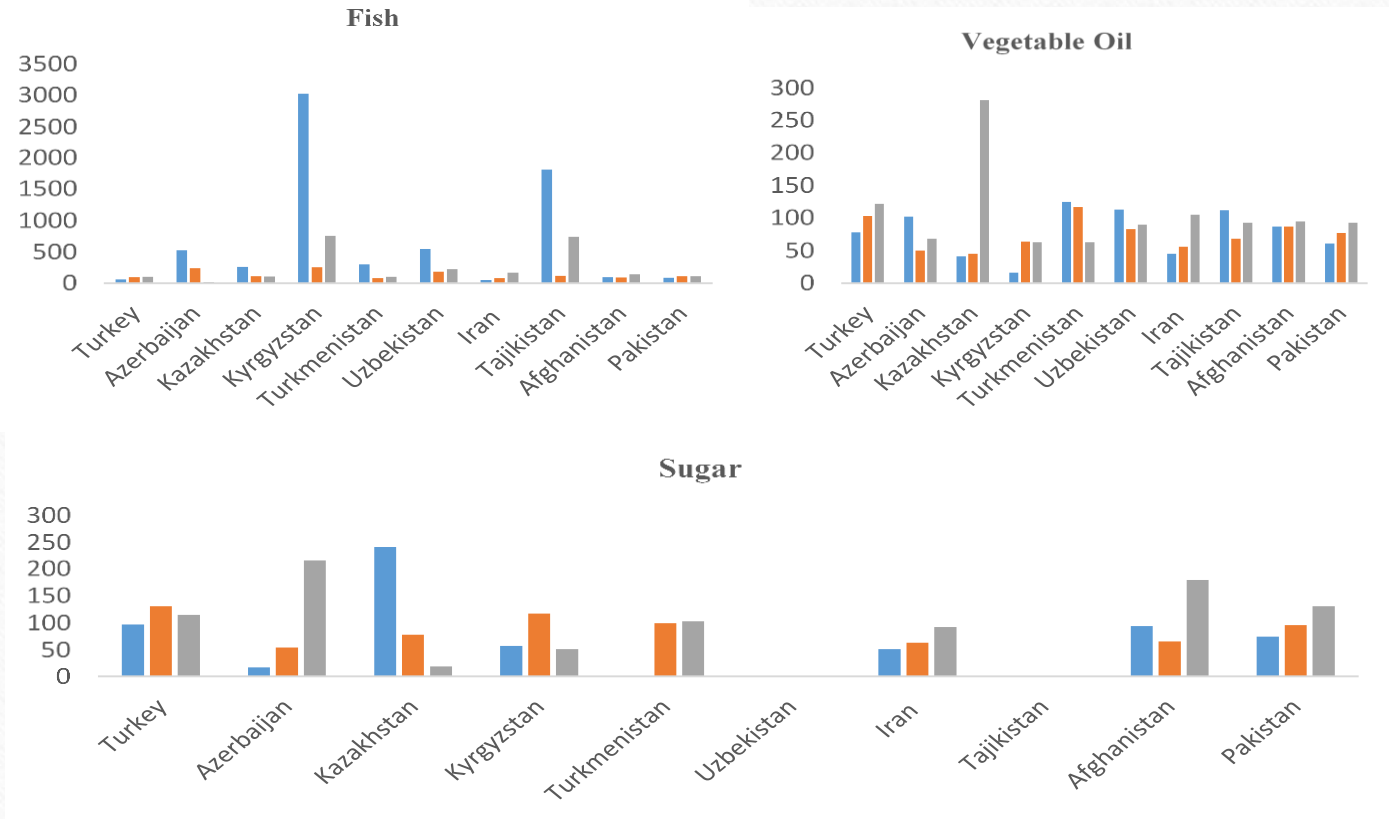


*Note: Blue, Red and Grey boxes represents estimates in years 1990, 2000 and 2014 respectively;  
These figure are based on production indices with base 2004-06 = 100*

*Source: FAO Yearbook 2015, FAOSTAT*

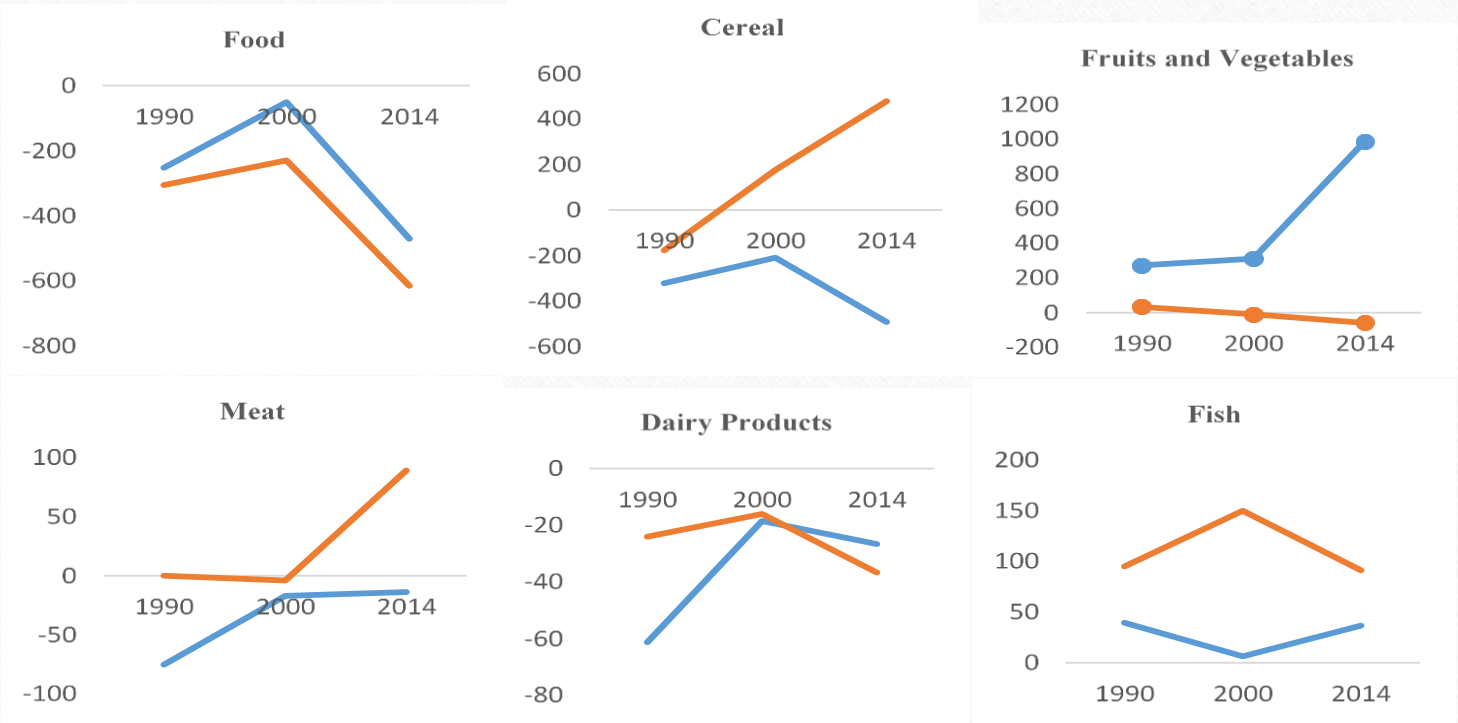


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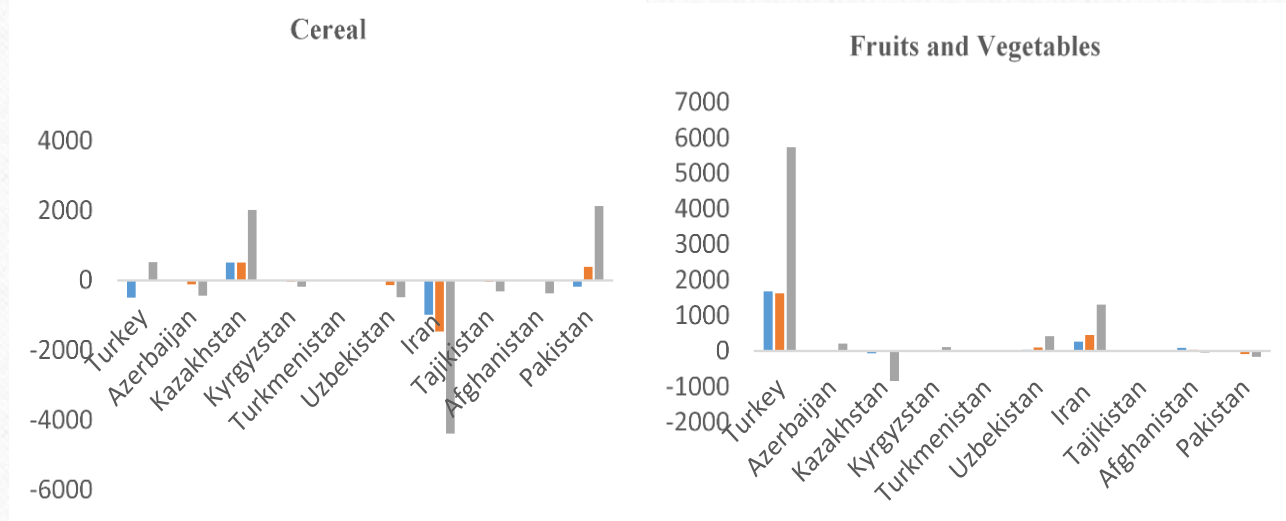
Figure 4a: Net Trade (mln US\$) for Different Food Groups across Low and High Food Deficit ECO Regions



*Note: Blue and Red lines indicate average for low and high food deficit regions respectively*  
*Source: FAO Yearbook 2015, FAOSTAT*



**Figure 5: Net Trade (mln US\$) for Cereal and Fruits and Vegetables in ECO Regions (Country-wise)**



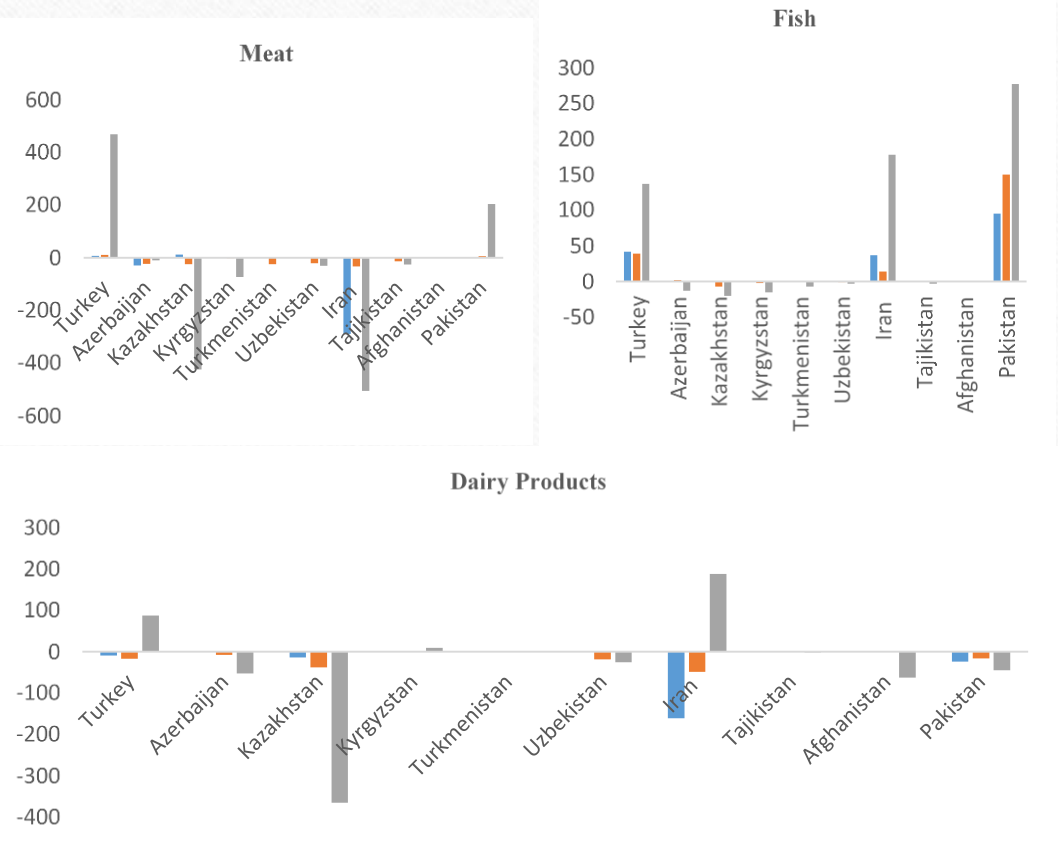
*Note: Blue, Red and Grey boxes represents estimates in years 1990, 2000 and 2014 respectively*

*Source: FAO Yearbook 2015, FAOSTAT*

	Categorized by MDG Hunger Target Achievement	Net Trade in Cereal (US mln)	Net TradeFruits and Vegetables (US mln)	Policy View from Empirical Evidence	Traditional View from Policy Documents
Turkey	Low	519	5738	Diversification	
Azerbaijan	Low	-432	206	Diversification	
Kazakhstan	Low	2019	-840	Self-sufficiency	Food Independence
Kyrgyzstan	Low	-185	106	Diversification	Food Independence
Turkmenistan	Low		-13	not clear	
Uzbekistan	Low	-483	412	Diversification	Food Independence
Iran	Low	-4387	1305	Diversification	
Tajikistan	High	-316	26	Diversification	Food Independence
Afghanistan	High	-372	-42	not clear	Food Independence
Pakistan	High	2125	-163	Self -sufficiency	Food Independence
	<i>Low Food Deficit Group</i>	-491.5	987.7142857	Diversification	
	<i>High Food Deficit Group</i>	479	-59.66666667	Self –sufficiency	

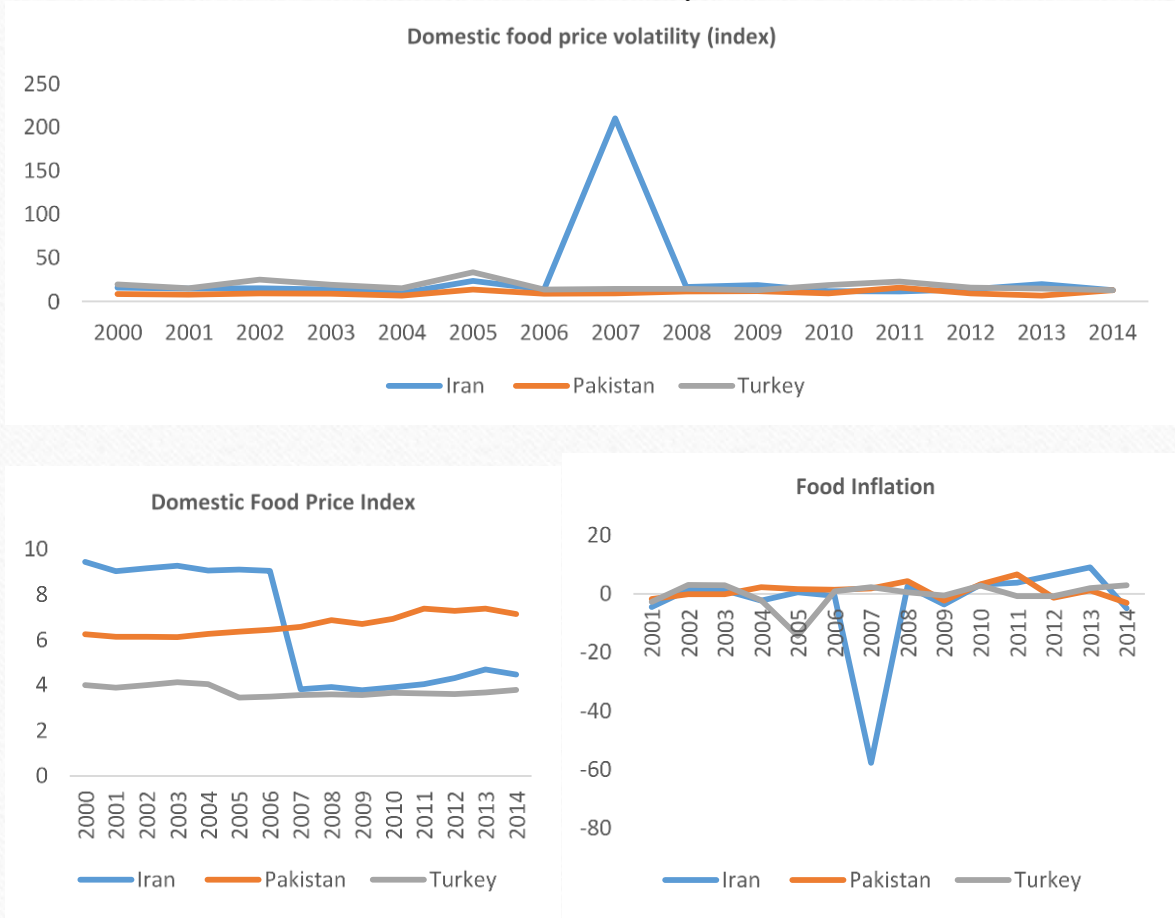


Figure 6: Net Trade (mln US\$) for Meat, Fish and Dairy Products in ECO Regions (Country-wise)



Note: Blue, Red and Grey boxes represents estimates in years 1990, 2000 and 2014 respectively  
Source: FAO Yearbook 2015, FAOSTAT

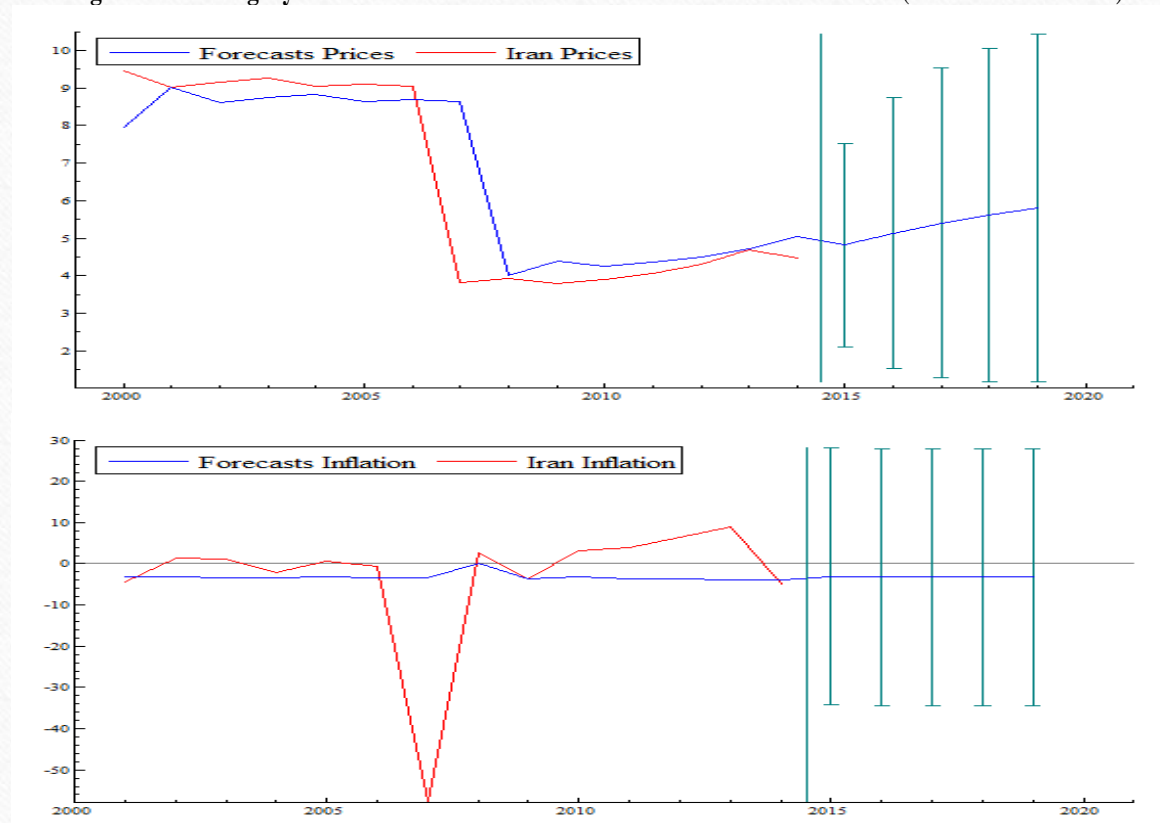
**Figure 7: Evolving Dynamics in Domestic Food Prices in Iran, Turkey and Pakistan (at Level, in its Rate of Change and its Variability)**



Source: FAOSTAT



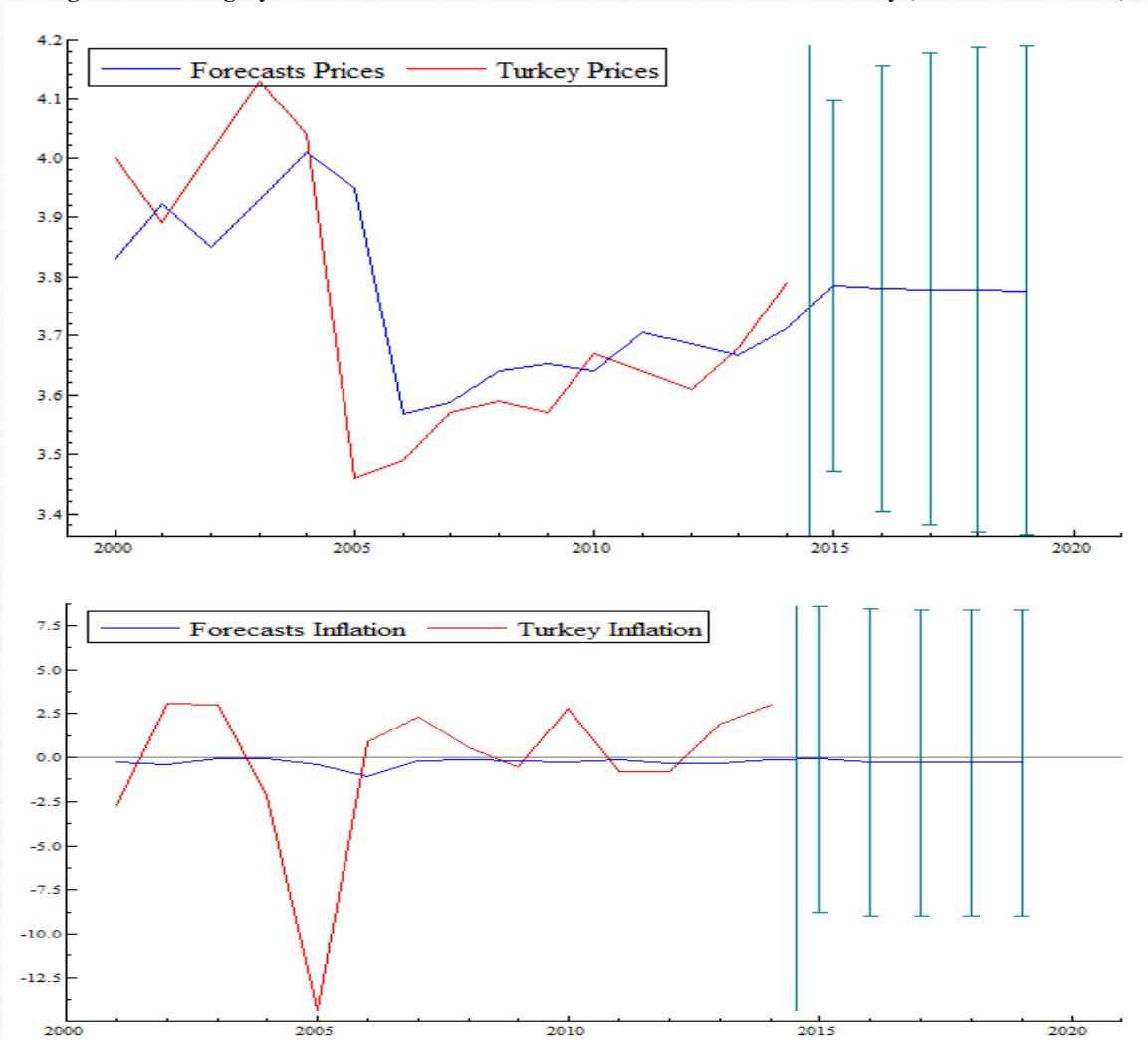
**Figure 8: Evolving Dynamics in Domestic Food Prices and Food Inflation in Iran (Actual and Forecast)**



*Note: In sample and out of sample forecasts for food price data of Iran (log-likelihood -26.4232153 ARMA(1,0,1) 2000-2014) and in sample and out of sample forecasts for food inflation data of Iran (log-likelihood -58.3030352 ARMA(1,0,0) 2001-2014)*

*Source: FAOSTAT*

**Figure 9: Evolving Dynamics in Domestic Food Prices and Food Inflation in Turkey (Actual and Forecast)**

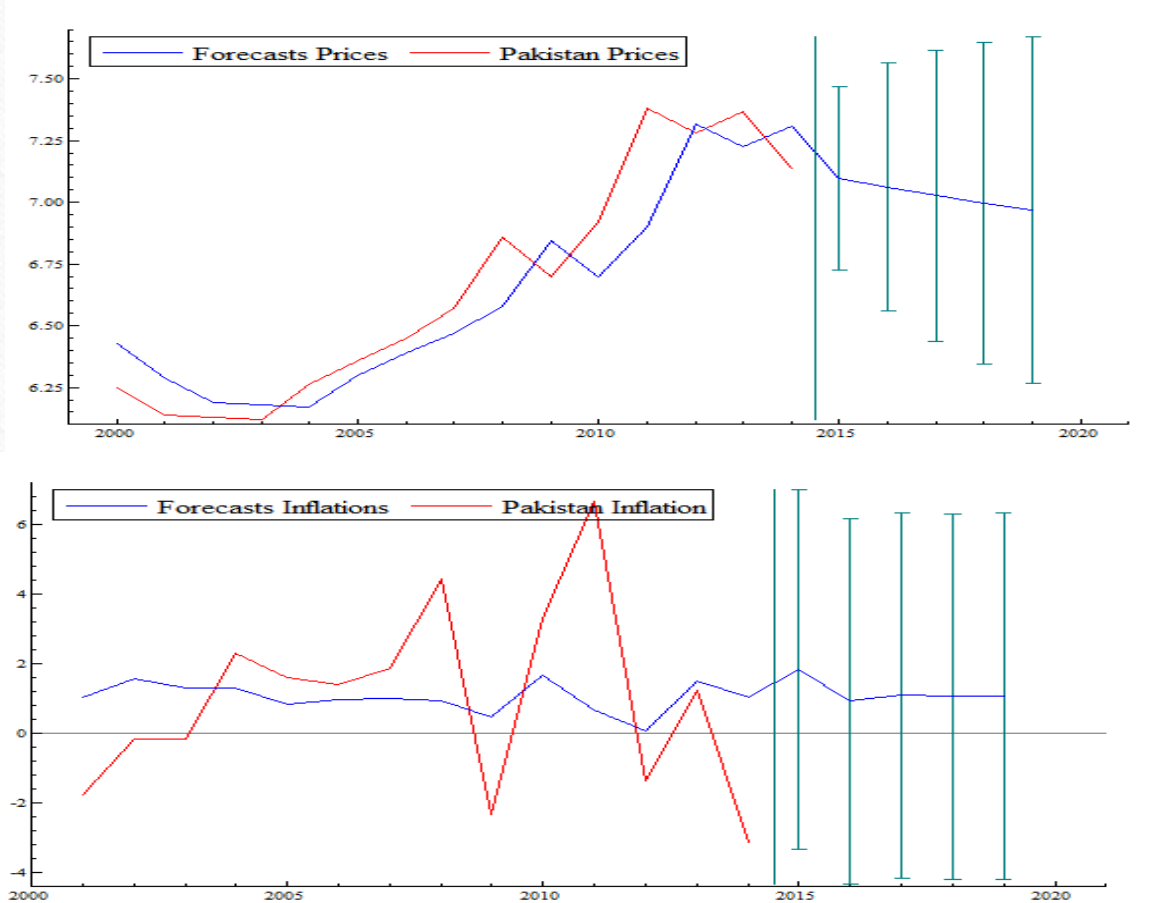


*Note: In sample and out of sample forecasts for food price data of Turkey (log-likelihood 6.22344208 ARMA(1,0,0) 2000-2014) and in sample and out of sample forecasts for food inflation data of Turkey (log-likelihood -40.4062581 ARMA(1,0,0) 2001-2014)*

*Source: FAOSTAT*



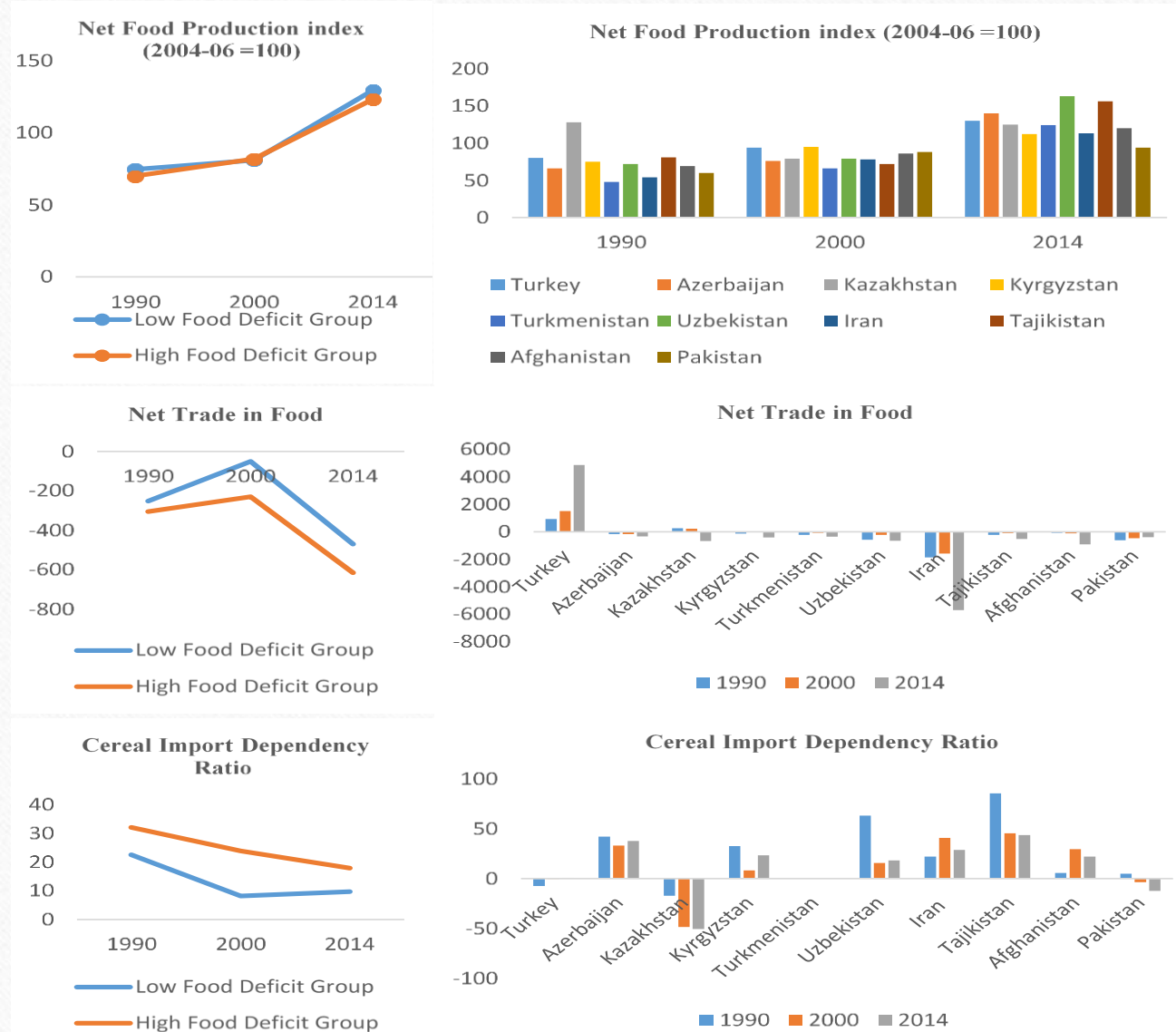
**Figure 10: Evolving Dynamics in Domestic Food Prices and Food Inflation in Pakistan (Actual and Forecast)**



*Note: In sample and out of sample forecasts for food price data of Pakistan (log -likelihood 3.09467699 ARMA(1,0,0) 2000-2014)) and in sample and out of sample forecasts for food inflation data of Pakistan (log-likelihood -33.1399383 ARMA(1,0,0) 2001-2014).*

*Source: FAOSTAT*

**Figure 10: Assessment of Vulnerability to International Price Shock**



Source: FAO Yearbook 2015, FAOSTAT



**Figure 10: Assessment of Vulnerability to International Price Shock (Continued)**



Source: FAO Yearbook 2015, FAOSTAT

### Categorization ECO Countries by Extent of Risk to Food Security in Face of International Price Shocks

	Countries	Progress MDG hunger target	*Cereal Import Dependency	Percentage Deviation for Regional Mean for **Gross International Reserves	Percentage Deviation from Regional *Mean for Value of food imports over total merchandise exports
No Risk	Turkey	fulfilled	Not Dependent	252.7%	-85.7%
	Iran	fulfilled	Dependent	214.7%	-78.6%
Moderate Risk	Turkmenistan	fulfilled	Dependent	-10.3%	-95.2%
	Kazakhstan	fulfilled	Not Dependent	-19.1%	-90.4%
	Uzbekistan	fulfilled	Dependent	-33.1%	-78.6%
	Azerbaijan	fulfilled	Dependent	-56.9%	-92.8%
Extreme risk	Tajikistan	Failed	Dependent	-98.5%	2.13%
	Kyrgyzstan	fulfilled	Dependent	-94.5%	-21.6%
	Afghanistan	Failed	Dependent	-79.9%	603.08%
	Pakistan	Failed	Not Dependent	-74.8%	- 61.9 %

Data Source: \*FAOSTAT, \*\*This information has been retrieved from secondary source namely PIDE Project Report on ECO Macroeconomic Modelling; Primary data sources are IMF, ADB and WDI as per project report



## Conclusion

- In both low and high food deficit zones, we are seeing a mix in policy practice of Food independence versus Crop Diversification. Hence there is no clear indication as to which policy path is more conducive for hunger reduction process.
- Among ECO countries only two countries Kazakhstan and Pakistan are following path of self-sufficiency in staple food production, within rest mostly there is policy practice of crop diversification towards cash crops.
- In terms of catering to increased local and international demand for animal protein, only two countries that are showing positive potential in this respect are Turkey and Pakistan.
- Finally in context of vulnerability to international price shocks we can categorize region into three sub-zones as per the extent of risk they face, however important policy note is that all high food deficit countries fall in category of those that are extremely vulnerable to international Price shocks

