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CONTENT

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The Political Economy of Food Security in North Africa

1. Introduction

2007/08 witnessed a serious global food price shock. In 2007 and the first half of 2008 global food prices escalated. From March 2007 to March 2008 wheat prices around the globe rose on average 130%. Energy and commodity prices fell in the latter part of 2008 due to a weakening global economy, but food prices again hit record levels in the first half of 2011 and are predicted to remain high for the foreseeable future (FAO 2008, World Bank 2008 and 2009, Oxfam 2011). This shock refocused the attention of many countries on the issue of food security, and the North Africa region, consisting of Egypt, Libya, Tunisia, Algeria, Morocco and Mauritania[1], was no exception.

When discussing the food security of North Africa, it is important to be aware that food security can be achieved at two levels – national aggregate food security and individual food security. The former exists when a nation has adequate food supplies to feed its population, either via domestic production, food imports, food aid or some combination of these. Individual food security exists when all individuals in a country have access to adequate food. National food security is necessary but not sufficient for individual food security in that a nation may have adequate national food supplies but they may not be accessible to all individuals – if for example they are tied up in centrally located national grain silos or if individuals cannot afford to buy food. In the past domestic policy makers in developing countries have sometimes focused excessively on national food security with strategies such as strategic grain reserves but have failed to achieve individual food security in their countries (for an example see Harrigan 2003 on Malawi). The focus on individual food security was strengthened by Amaytra Sen's famous analysis of famines (Sen 1981) in which he used the demand-side concept of "entitlements" to food. Sen argued

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[1] Within this country group, Mauritania, Morocco and Egypt are Lower Middle Income Countries, and Libya, Algeria and Tunisa are Upper Middle Income Countries.

that individuals need entitlements to food and this will depend, amongst other things, on their income and assets. Hence, there can be individual hunger and famine even when food supplies are adequate. Sen's analysis showed that it is not just the supply side of food that is important but also demand side factors in ensuring individual food security. Another way of expressing the importance of both supply side and demand side factors is the "three As" – Availability of food, Accessibility of food and Affordability of food. Related to this is the definition of food security adopted by the World Food Summit in Rome in 1995 and now generally accepted by most international organisations as a working definition:

"Food security exits when all people, at all times, have physical, social, and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life"[2].

Since the early 1970s there has been a steady growth of food demand in the North Africa region stimulated by rapid population growth and urbanisation, changing patterns of food consumption based on rising incomes that favour higher valued foods. Ecological constraints on food production in North Africa, however, are severe, with shortages of both arable land and water (Weinbaum 1984, Wilson and Bruins 2005, World Bank 2009, IFPRI 2010a, IFAD 2011). As a result of these demand and supply factors, North African countries are forced to import a large percentage of their total food requirements. Most Arab countries in the broader Middle East and North Africa (MENA) region now import at least 50% of the food calories they consume and the region is the largest importer of cereal in the world (FAO 2008, World Bank 2009). The North African dependence on food imports is projected to increase in the coming two decades, with the greatest increase of all MENA countries predicted for Egypt (IFPRI 2008, FAO 2006, 2008b). The recent food price shock and the projected increased reliance on food imports mean that North African governments have become acutely aware of the vulnerability caused by reliance on global food markets to meet domestic demand.

These vulnerabilities were displayed in terms of the adverse socio-economic and political impact of the global food price shocks on the North African economies. The sharp rise in the price of food imports contributed to macroeconomic problems such as rising inflation, widening trade deficits and fiscal strain as governments tried to cushion the effects of higher food prices. The failure to prevent transmission of increased global food prices to increased domestic food prices in the region also meant that local populations suffered from increasing living costs which contributed to poverty, under-nutrition and other negative social welfare effects. This in turn seems to have acted as one of the trigger factors contributing to the political uprisings in 2011 in countries such as Tunisia, Egypt and Libya, popularly known as the "Arab Spring" (Harrigan 2011b). In addition to the domestic political implications, a heavy reliance on food imports brings with it geo-political considerations. Global food markets are thin, in the sense that only a small proportion of total global food production is actually traded on international markets. As a result, five major suppliers, Argentina, Australia, Canada, the EU and USA, account for 73% of the world's traded cereals (FAO 2008). This means that access to cereal imports for the North African states is contingent on good geo-political relations with these major suppliers. However, the geo-political stance of the new regimes coming to power in Egypt, Tunisia and Libya remains uncertain.

The recent global food price shock combined with the political upheaval in North Africa, provides an opportune moment for the North African countries, along with the international community, to take stock of the food security status of the region and to reappraise food security strategies in countries like Egypt, Tunisia, Libya, Algeria, Morocco and Mauritania. There are already signs that governments in the region are doing this and are becoming less willing to rely so heavily on food imports as the route to food security. Consequently, the concept of "food sovereignty" is gaining currency in the region, whereby nation states secure greater control and power over their sources of food, and adopt strategies that are not just dictated by international market forces. This is leading to two new approaches to food security – land acquisition in third party countries to secure direct access to food supplies which by-passes international food markets and a renewed emphasis on domestic food production in the North African countries themselves.

This paper is designed to provide such a stock taking exercise and to appraise the future of food security in North Africa from a political economy perspective. Section 2 presents an analysis of the current food security status of the six North African countries using a variety of macro and micro level indicators. Section 3 looks at the impact of the 2007/08 food price shock on the macro economy, on the welfare of households and individuals and on the politics of the region. Section 4 assess the short–term response of Governments to the shock and questions the sustainability of such responses. Section 5 looks at the longer term options for achieving sustainable food security and food sovereignty in the region and discusses the policy implications of such options and the potential role of the international donor community in helping to design and implement such strategies. Section 6 concludes.

[2] See www.fao.org/wfs/index_en.htm

2. The Food Security Status of North Africa

It is often argued that MENA is one of the most food insecure regions in the world. This characterisation is based on the region's heavy reliance on food imports (IFPRI 2010a, 2012 Wilson and Bruins 2005, World Bank 2009) and the fact that it has the largest food deficit of any region in the world in terms of cereal imports as a proportion of domestic consumption. The North Africa sub-region of MENA is likewise heavily dependent on food imports.

However, food imports are only one dimension of food security and relate to the macro level of national food security from a supply side perspective. Other variables that help determine a region's food security status include wealth levels, income distribution, and fiscal position. These variables differ not only between regions but also between nations. The joint World Bank/IFAD/FAO report on improving food security in Arab countries (World Bank 2009) argues that food security is partly determined by resource endowments which affect the level of food import requirements and also by fiscal balance which influences a country's ability to afford food imports. Using these variables the report produces a scatter diagramme with cereal import dependency on the vertical axis and fiscal position on the horizontal axis. The report shows that there is considerable variability between different North African countries in the group. No country falls in the least vulnerable quadrant whilst Libya and Algeria have a high cereal import dependency but are fiscally sound. This means that they are not particularly vulnerable to global food price shocks as due to their natural resource base, predominantly oil and gas, they have a sound fiscal position and can afford food imports. This is reinforced by the fact that traditionally global food prices and oil prices move together (World Bank 2009). Their high import dependence however makes them vulnerable to quantity shocks such as trade embargoes or export bans by food exporting countries. Egypt is less dependent on cereal imports as the country has a strong food production base, but is fiscally strained making her vulnerable to global price shocks. Morocco and Tunisia fall into the most vulnerable group (although they are on the edge of this group) since they have both a high cereal import dependence as well as being fiscally strained.

IFPRI (2010a) uses the following variables to produce a composite indicator of food security: food trade balance (ratio of total exports to food imports); food production per capita to indicate agricultural potential; and the Global Hunger Index (GHI)[3] , the latter being a micro level indicator reflecting food security at the individual or household level. In addition, IFPRI classifies high income countries as food secure. The IFPRI country classification is given in Table 1.

As can been seen from Table 1, all five North African countries in the sample are classified as food security challenged, with Algeria and Libya in the "mineral resource rich" group and Egypt, Morocco and Tunisia in the "mineral resource poor" group. Clearly, being a mineral resource rich country does not guarantee food security.

The most recent IFPRI publication on food security in the Arab world (Breisinger et al 2012) also uses both micro and macro level indicators. The micro level indictor is the prevalence of child stunting and the macro level indicator is food imports as a ratio of total exports and net remittances. According to these two combined indicators the classification is: Mauritania = Alarming; Morocco, Algeria and Egypt = Serious; Tunisia and Libya = Moderate. Figures 1 and 2 illustrate the micro and macro classification for all Arab countries.

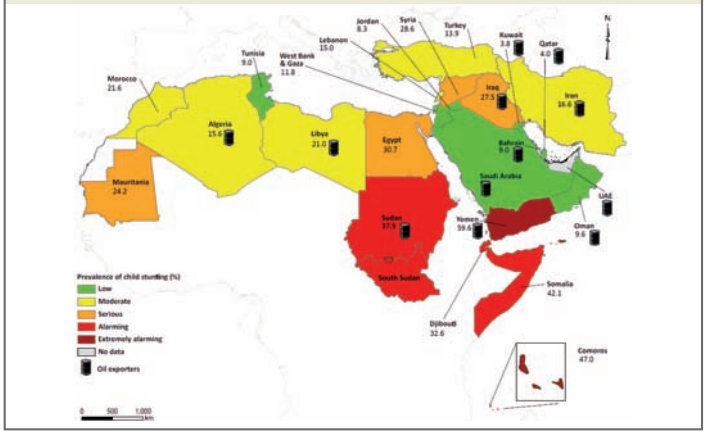
[3] The GHI is a multidimensional approach to measuring hunger combining three equally weighted indicators 1) the proportion of undernourished as a percentage of population, 2) the prevalence of underweight children younger than five, 3) the mortality rate of children younger than five. The index ranges from 0 to 100, with 100 being the worst score (IFPRI 2011).

Table 1 : Classification of MENA Countries According to Food Security Levels and Mineral Wealth

	Total exports/ food imports	Food production per capita	Global Hunger Index	GNI per capita
Food security challenge countries				
Mineral resource rich				
Algeria	8,7	111	<5	2 720
Iraq	n/a	n/a	n/a	*800
Libya	11,1	133	<5	5 860
Sudan	5,5	148	19,6	640
Syria	8,9	237	5,2	1 430
Yemen	4,9	44	27	650
Mineral resource poor				
Djibouti	2,1	54	22,9	1 000
Egypt	6,9	199	<5	1 270
Jordan	4,7	120	<5	2 490
Lebanon	2,4	258	<5	5 520
Morocco	8,1	163	5,8	1 990
Tunisia	11,2	220	<5	2 880
West Bank and Gaza	1,1	135	n/a	1 230
Food secure countries				
Mineral resource rich				
Iran	15,9	246	<5	2 580
Bahrain	n/a	n/a	n/a	*24,733
Kuwait	25,4	55	<5	30 630
Saudi Arabia	19,2	104	<5	12 540
United Arab Emirates	17,2	114	n/a	22 583
Qatar	n/a	n/a	n/a	*76,000
Oman	n/a	n/a	n/a	*24,674
MENA average	9,6	146	5,2	6 001
MENA - Food security challenge	6,3	152	n/a	2 307
MENA - Food secure	19,4	130	n/a	17 083
World average	11,3	233	15,2	

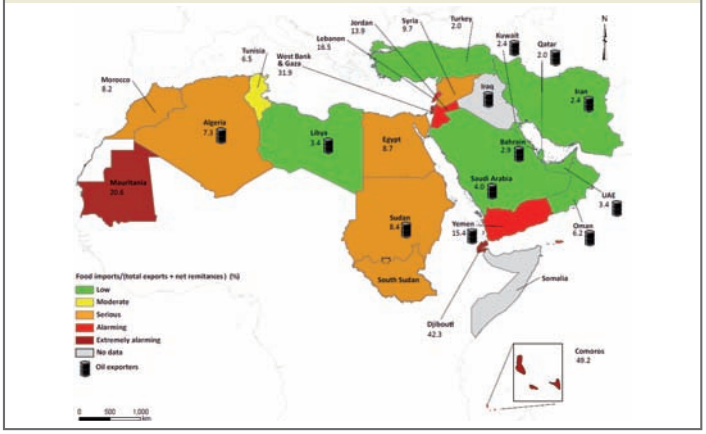
Source: Authors' calculations based on Yu, You and Fan 2009.
Note: Countries are defined as food secure if the value of the food security indicator is above the respective international average of this indicator. Gross national income (GNI) is for 2005 based on World Development Indicators 2008. MENA = Middle East and North Africa.
**International Monetary Fund gross domestic product estimate for 2007.*

Figure 1 : Micro Classification of Food Security in MENA



Source : Breisinger et al 2012, Figure A1.2

Figure 2 : Macro Classification of Food Security in MENA



Source : Breisinger et al 2012, Figure A1.1

Table 2 provides more detailed information of the micro aspects of food security in the six North African countries in the form of the data underlying the calculation of the Global Hunger Index for the six countries of North Africa and shows how these indicators have changed since 1990.

As can be seen from Table 2, all of the North African countries apart from Mauritania score well on the GHI. Mauritania stands out as a Lower Middle Income Country with a poor micro level food security status. All six countries have seen an improvement in their Global Hunger Indices between 1990-2011. The only alarming trends that emerge from the Table are that both Libya and Morocco experienced a small increase in the percentage of underweight children between 1990-2011 and Egypt and Libya experienced a slight increase in the GHI in the most recent period i.e. between 2001-2011 (IFPRI 2011 Appendix A) – although both remained below a score of 5 such that their GHI was still classified as low.

Table 2 : North African Countries Global Hunger Index 1990-2011

	% population undernourished				% underweight children under 5 years				% mortality under 5 years				Global Hunger Index GHI			
	90-92	95-97	00-02	05-07	88-92	94-98	99-03	04-09	1990	1996	2001	2009	1990	1996	2001	2011
Algeria	4*	5	5	4*	9,2	11,3*	8,3	3	6,1	5,4	4,4	3,2	6,4	7,2	5,9	<5
Egypt	4*	3*	3*	4*	10,5	10,8	4,3	6,8	9	6,1	4,3	2,1	7,8	6,6	<5	<5
Libya	1*	1*	1*	1*	4,8*	4,3	4,2*	5,6	3,6	2,9	2,4	1,9	<5	<5	<5	<5
Mauritania	12	9	8	7	43,3*	29,1*	30,4	19,4	12,9	12,5	12,2	11,7	22,7	16,9	16,9	12,7
Morocco	6	6	6	4*	8,1	7,7	7,1*	9,9	8,9	6,5	5,3	3,8	7,7	6,7	6,1	5,9
Tunisia	1*	1*	1*	1*	8,5	5,7	3,5	3,3	5	3,4	2,6	2,1	<5	<5	<5	<5

Source : IFPRI 2011
*Note: * denotes IFPRI estimate*

Table 3 summarises the classification of the North African countries in terms of their food security status according to the studies cited above.

Summarising the information contained in Table 3, Mauritania stands out as the country with the most serious food security problems in North Africa. Using the micro level data contained in the GHI, Morocco is the only other country that stands out as having a Moderate hunger level. However, once macro level indictors (such as dependence on food imports and fiscal position) are introduced to the analysis, all of the North African countries seem to suffer from food insecurity problems. Hence, in the remainder of this paper, we pay particular attention to the macro dimensions of food security, including the role of food imports in the region and the fiscal implications of policies designed to curb the impact of rising food import prices on the population of the North African countries.

Table 3 : Summary of North African Countries Food Security Classifications

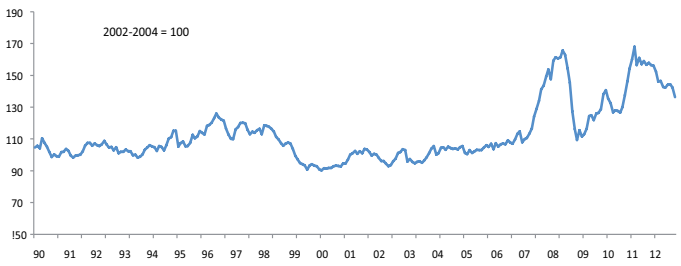
	Algeria	Egypt	Libya	Mauritania	Morocco	Tunisia
World Bank 2009	Dependant but fiscally sound	Less dependent but fiscally strained	Dependant but fiscally sound	n/a	Most vulnerable	Most vulnerable
IFPRI 2010	Food security challenged	Food security challenged	Food security challenged	n/a	Food security challenged	Food security challenged
IFPRI 2012	Serious	Serious	Moderate	Alarming	Serious	Moderate
GHI 2011	Low	Low	Low	Serious	Moderate	Low

3. The Impact of the 2007/08 Global Food Price Shock

3.i. The Magnitude of the Food Price Shock

2007 and the first part of 2008 witnessed a massive increase in global food prices. Although this was partially reversed by the end of 2008, early 2011 saw a second major spike in which prices reached an historic high. Figure 3 clearly shows these two spikes in global food prices.

Figure 3 : FAO Food Price Index



Source: http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/
Note: The FAO Food Price Index is a measure of the monthly change in international prices of a basket of food commodities. It consists of the average of five commodity group price indices (representing 55 quotations), weighted with the average export shares of each of the groups for 2002-2004.

The sharp increase in global food prices since 2007 is due to a number of underlying structural factors. Rapid population and income growth in countries such as China, India and the Gulf States has led to demand-pull price increases for food in recent years. Related to this are changing global food consumption patterns towards meat – 30 per cent of world grain now goes to feed animals, but an acre of arable land can produce 63 kilos of protein from grain but only 9 kilos of protein from beef (World Bank 2009). Another source of recent increased demand has been the growth in biofuel demands for land and crops especially in the USA which accounts for 28 per cent of world cereal exports (Fabiosa et al 2008). This is in response to record high oil prices in recent years. High oil prices have also pushed up the price of food in a more direct way since oil is an input to fertilisers, pesticides and fuel for tractors and machinery and also affects transport costs of food.

Structural factors on the supply side have also contributed to the recent increases in food prices. The thinness of global food markets along with limited global stocks of food especially in OECD countries compared to high levels of the 1980s and 1990s, have pushed up prices (Gardner and Sumner 2007). This has been exacerbated by the effects of climate change causing natural disasters in major producers of food such as the recent severe flooding in Pakistan and Australia and droughts in Russia, Ukraine and Argentina. Climate change (Cline 2007) along with other factors has also resulted in declining global productivity growth rates for major cereals. These supply side problems triggered export restrictions or bans by major world suppliers, for example in 2007/08 India and Egypt restricted their rice exports, and wheat exports and other grain exports were banned by Russia, Ukraine, Argentina and Kazakhstan. Finally, financial trading in agricultural commodities has increased dramatically in recent years. In 2008 $150 billion was invested in index and other funds for agricultural commodities compared to only $15 billion in 2004 (World Bank 2009). This financial speculation has pushed up prices in the last few years and also caused increased volatility in food prices. The persistence of these underlying structural factors means that global food prices are predicted to remain high in the forseable future, with Oxfam (2011) for example, predicting that global food prices will double in the next twenty years.

3.ii. The Macro-economic Impact of the Global Food Price Shock

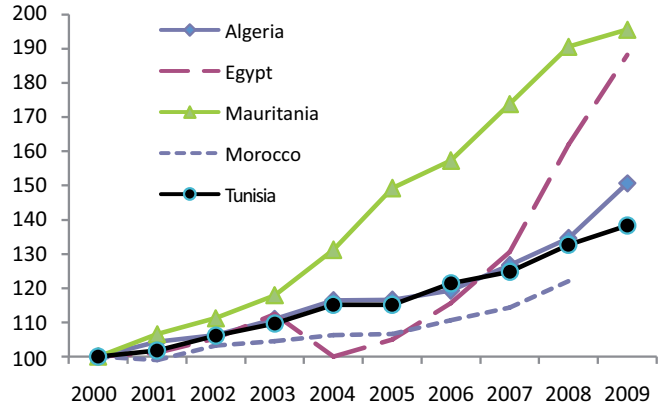
At the macroeconomic level the global food price increases contributed to inflation in the MENA region, with regional inflation increasing more than twice the speed of world inflation in 2007/8 (IMF 2008). It also contributed to widening trade deficits in many countries. In addition, as governments in the region tried to cushion the impact of rising global food prices on their domestic populations, this increased fiscal strain especially in the resource poor non-GCC countries. The fiscal impact is discussed in Section 4 below.

Albers and Peters (2011) have analysed the impact of rising global food prices on inflation in the Southern Mediterranean region (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, Syria and Tunisia). They found that, on average, food prices exhibited strong increases outpacing

the growth of overall inflation between the end of 2005 and mid-2008. Average overall consumer price inflation in these countries rose from 3.4% in July 2007 to 10.0% in July 2008. This was to a large extent caused by a sharp rise in food prices by 9 percentage points from 5.8% to 14.8% during the same period. Albers and Peeters conclude:

"The share of food inflation in total inflation in the region has been extremely high at some points during the price upsurge, as much as 60% and 80%. This shows once more the extent to which food inflation had put considerable upward pressure on total prices in ENP Mediterranean countries."

Figure 4 : Food Price Inflation in North African Countries 2000-2009

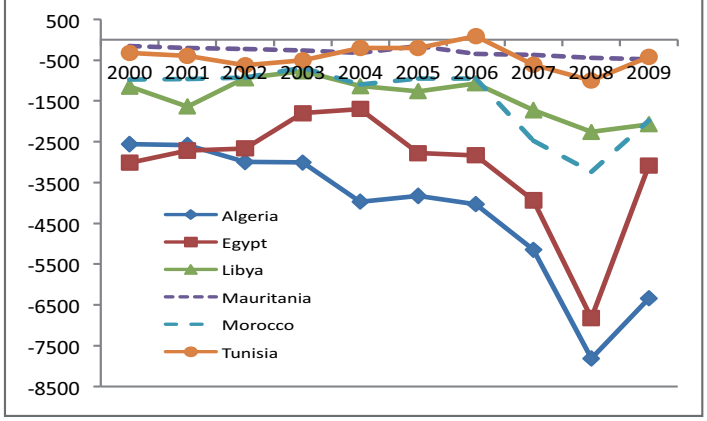


Source: FAOSTAT

Figure 4 illustrates the rate of food price inflation for five North African countries. The food price increases in Mauritania Algeria and Egypt were larger than those recorded in Tunisia and Morocco. Albers and Peeters speculate that this was due to the fact that the latter two countries have larger domestic agricultural sectors. Although global food prices fell in the second part of 2008, this decrease was mitigated by a degree of downward price rigidity in the Southern Mediterranean countries, which was particularly notable in Egypt were inflation hardly dropped below 10%[4].

Figure 5 shows the agricultural trade deficit for the six North African countries. As can be seen there was a sharp increase in this deficit for Algeria and Egypt following the 2007/08 global food price hike as well as a significant increase for Libya and Morocco.

Figure 5 : Agricultural Trade Deficit for North African Countries 2000-2009 (US$ million)



Source : FAOSTAT

3.iii. The Impact on Living Standards and Welfare

The global food price shock of 2007/08 led to a sharp increase in the consumer prices of food in the import-dependent North African countries which has affected the population's living standards, increased poverty and made it increasingly difficult for many to feed their families (ESCWA 2010, Breisinger et al 2012, IMF 2011). Although Government policies, such as increasing expenditure on food subsidies, mitigated the extent to which the global food price increases were transmitted to the domestic economy, Figures 4 shows that there was still a significant degree of food price inflation in the region.

At the microeconomic or household level, rising global food prices contributed to increased poverty. With the exception of Mauritania, where 21.2% of the population were estimated to live below the $1.25 per day poverty line in 2000, less than 5% of the population in North Africa fall below this poverty line (more recent figures are not available for Mauritania or for Algeria or Libya). Table 4 provides data on poverty in North Africa. However, Breisinger et al (2012) demonstrate that official income-based measures of poverty, such as those given in Table 4, underestimate the true extent of poverty in the Arab region. This argument is echoed for Egypt by Sabry (2010).

Regardless of the debate on poverty measures, it is well known that the poor in the region spend between 35 per cent and 65 per cent of their income on food (ESCWA 2010). Hence, to the extent that

[4] Albers and Peeters (2011) use econometric estimations to examine downward price rigidity in consumer price inflation in Southern Mediterranean countries. They find that a 10% upward shock in global food prices leads almost immediately to a 1% increase in CPI inflation, but that a 10% decrease in global food prices has no effect on these countries' CPI (ibid Box 2).

rising food prices were transmitted to domestic consumer food prices the poor were adversely affected. In addition, in the North Africa region there is a high concentration of people who are near the poverty line (just above), such that poverty vulnerability in the region is high. For example, although less than 3% of the population live below the $1.25 per day poverty line in Egypt, Morocco and Tunisia, over 12% fall below the $2 per day level in Tunisia and Morocco with this figure rising to 18.5% for Egypt. This makes poverty very sensitive to even small increases in the cost of living, with relatively small shocks having the potential to tip large numbers into poverty. Rural landless, marginal farmers and urban poor are the most vulnerable groups in this respect.

As a result of rising domestic food prices combined with the high percentages of income spent on food in the region, not just by the poor but also the middle classes in the region (see Table 6 below) and the fact that a large number of people live just above the poverty line, the global food price shock of 2007/08 is estimated to have increased poverty and the number of undernourished people in Arab countries. According to ESCWA the food price shock of 2007/08 created an additional 2.19 million poor people in six of the conflict ridden countries of the MENA region (see Table 5). In Egypt, for example, it is estimated that the 2007/08 global food price shock added over half a million people to the poverty headcount, an increase of around 4.5%.

Table 4 : Poverty Headcount for North African Countries

	Years	Poverty headcount ratio at $1.25 a day (PPP) (% of population)	Poverty headcount ratio at $2 a day (PPP) (% of population)	Poverty headcount ratio at national poverty line (% of population)	Poverty headcount ratio at rural poverty line (% of rural population)	Poverty headcount ratio at urban poverty line (% of urban population)
Morocco						
	1995	10.29	28.53			
	1991	2.45	15.9			
	1999	6.76	24.43	16.3	24.2	9.5
	2001	6.25	24.34	15.3	25.1	7.6
	2007	2.5	13.97	9	14.5	4.8
Tunisia						
	1985	8.65	25.14	7.7		
	1990	5.87	19.04	6.7		
	1995	6.48	20.39	6.2		
	2000	2.55	12.82	4.2		
	2005			3.8		
Mauritania						
	1987	41.32	64.62			
	1990			56.5		
	1993	42.79	68.59	0		
	1996	23.4	48.3	50.5	68.1	26.8
	2000	21.16	44.13	46.3	61.2	25.4
Algeria						
	1988	7.56	24.55	12.2	16.6	7.3
	1995	6.79	23.61	22.6	30.3	14.7
Egypt, Arab Rep.						
	1991	4.46	27.64			
	1996	2.45	26.31	19.4		
	2000	1.81	19.37	16.7	22.1	9.3
	2005	1.99	18.46	19.6	26.8	10.1
	2010			21.6	28.9	11

Source : WDI online and Sabry (2010)

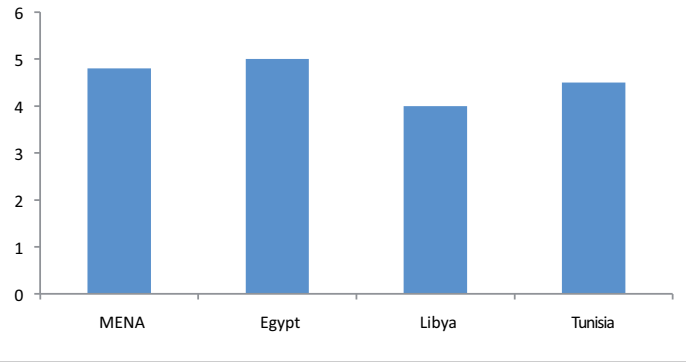
Table 5 : Poverty and New Poverty due to Food Crisis in Conflict-Ridden MENA Countries

Country	Population 2006 (millions)	Pre-crisis poverty headcount (millions)	New poor (millions)
Egypt	78.0	13.0	0.59
Jordan	5.5	0.8	0.03
Palestine	3.7	1.2	0.05
Sudan	39.5	23.7	1.07
Syria	19.5	2.2	0.10
Yemen	21.6	7.7	0.34
Total	167.8	48.6	2.19

Source : ESCWA 2010, Table 8.

The impact of rising food prices on poverty has been exacerbated by the fact that despite registering high rates of economic growth during the first decade on the twenty first century, growth has failed to trickle down. In recent years North Africa has experienced satisfactory rates of economic growth and has weathered the global recession well. As shown in Figure 6, economies in the MENA region, including some of the North African countries, grew on average by 4-5 per cent a year in real terms between 2000 and 2010. These figures compare favourably with those of regions with similar income levels, with the growth rate of Latin America and the Caribbean in the same period averaging only 3.4 per cent.

Figure 6 : Real Annual Average GDP Growth Rates 2000-2010, %

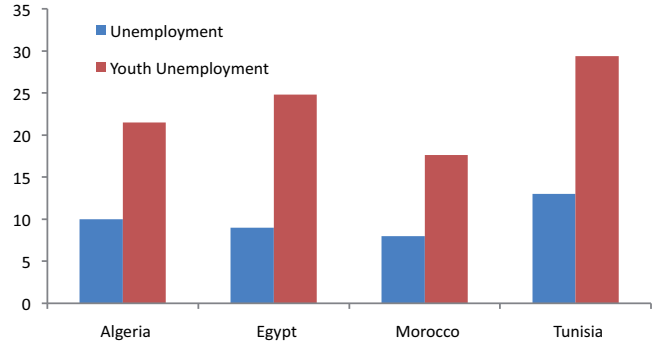


Source : Hakimian (2011), Figure 1.

However, the last decade of growth in North Africa did not take the form of labour-intensive pro-poor growth with benefits trickling down to the masses. Rather, in many countries poverty, unemployment and income inequality have worsened over the past decade. For example, in Egypt the poverty headcount using the National Poverty Line, increased from 16.7 per cent in 2000 to 21.6 per cent in 2010 as shown in Table 4, and these figures are likely to be underestimated, partly because the national poverty lines underestimated living costs (Sabry 2010).

In addition to declining living standards due to inflation, unemployment is another pressing problem in North Africa. As shown in Figure 7, unemployment in 2010 ranged from 8-13 per cent in North African countries. A particular problem is youth unemployment, which ranged from 17.6 per cent in Morocco to 29.4 per cent in Tunisia. Many of these unemployed youth are high school or university graduates. One of the reasons why unemployment, particularly youth unemployment, is high in North Africa is the fact that the region has a demographic profile incorporating a large youth bulge, combined with the lack of adequate employment to absorb the new entrants to the labour force. Two factors help explain the lack of employment creation. First, the failure to generate labour-intensive export-led growth, which is reflected in the fact that the MENA region has failed to fully participate in the economic globalisation of the past three decades, as shown by declining trade to GDP ratios and disappointing inflows of DFI (Harrigan and Tilley 2011). And second, the failure of the private sector to adequately respond to the reform effort by creating jobs. Part of the reason for the lack of job creation is the unfavourable business environment in North Africa (Harrigan 2011a).

Figure 7 : Unemployment Rates in North African Countries, % 2010



Note: Youth unemployment is for those aged 15-25 years.
Source: Hakimian (2011), Figure 2.

3.v. *Food Prices and the Arab Spring*

Although the 2011 political uprisings in North Africa, as well as elsewhere in the Arab world, collectively known as the "Arab Spring", were essentially motivated by citizens' desire to reverse decades of political repression and human rights abuses, they also had important socio-economic underpinnings (Harrigan 2011a,b). High rates of unemployment, especially amongst youth, combined with increasing poverty and inequality, essentially meant that the old implicit Social Contract between regimes and their citizens, whereby autocratic regimes were tolerated in return for their provision of social welfare[5] (Richards and Waterbury 2006) was unravelling (Harrigan and El-Said 2009a,b; Karshenas and Alami 2012).

Within this context, the food prices increases which started in 2007/08 were one of the final nails in the coffin of many of the repressive regimes which were no longer able to deliver on the Social Contract (Harrigan 2011b). Hence the political uprisings of 2011 were partly because the population in countries like Egypt, Tunisia and Libya were fed up with repressive regimes which were failing to combat food price rises, poverty, unemployment and growing income inequalities.

Table 6 : Percentage of Income Spent on Food and Non-alcoholic beverages in 2008

USA	6.8
UAE	9.0
Qatar	12.8
Kuwait	14.6
Israel	17.8
Saudi Arabia	23.7
Iran	26.3
Tunisia	35.8
Egypt	38.3
Morocco	40.3
Jordan	40.8
Algeria	43.8

Source: US Department of Agriculture: http://www.ers.usda.gov/Briefing/CPIFoodAndExpenditures/Data/Table_97/2008table97.htm

It was not just the poor who were affected by rising food prices. The middle classes, who made up many of those who took to the streets during the political uprisings in North Africa, were also adversely affected. This is because on average MENA populations spend a much greater share of their income on food compared to the high income Western economies. This is clearly shown in Table 6.

As can be seen from Table 6, in USA the average amount of income spent on food is only 6.8%, whilst for countries like Tunisia, Egypt, Morocco, and Algeria it is around 40%. The impact that food price increases have on the middle classes in the region is particularly well illustrated in the case of Egypt where the middle class spend over 40 per cent of their take home incomes on food (credit Suisse 2011).

Even before the onset of the Arab Spring, countries in the region were witnessing political unrest as a direct result of food price increases, and it is noteworthy that many of the countries that experienced the food demonstrations of 2007/08 are the countries experiencing the political uprisings of the Arab Spring, for example Egypt. Clearly aware of the potential for increasing food prices to cause political instability, many incumbent regimes in the region responded to these food price demonstrations with attempts to cushion the impact of rising food prices (see Section 4 below). Following the food price shock of 2007/08, there was a new high in global food prices in the first quarter of 2011 (see Figure 3) as countries like Russia banned wheat exports for 2011. Hence MENA countries suffered another round of dramatic price hikes for basic foodstuffs such as rice, cereals, cooking oil and sugar. In Egypt for example, food inflation reached over 20% in the early months of 2011, one of the highest rates in the world and this had a severe impact on both the poor and the middle classes. Food price increases also played a major role in the unrest in Tunisia and Algeria. This is illustrated by the fact that in response to protests in Tunisia in January 2011, President Ben Ali promised to reduce the price of staples such as sugar, milk and bread but this was too late to save his regime.

Breisinger et al (2011a) provide further evidence that key socio-economic factors, including food prices, underpinned the Arab Spring. Based on data from the Gallup World Poll "WorldView", they report the number of people in the Arab world dissatisfied with their standard of living in 2010 and the change in the number of dis-satisfied people since the previous poll. Although Mauritania, Tunisia and Algeria experienced an improved level of satisfaction,

[5] This Social Contract has consisted of governments providing populist forms of social welfare such as heavy universal subsidies on food , housing, fuel and utilities as well as through providing guaranteed jobs with many perks in a bloated public sector.

both Egypt and Morocco experienced a large increase in the numbers of dis-satisfied people – in 2010 22.8 million people in Egypt said they were dis-satisfied with their standard of living and around 15 million in Morocco.

The authors also report on the proportion of people who felt they did not have enough money to buy food. This subjective assessment of food security increased or remained unchanged in all but one of the 12 countries surveyed. Egypt saw a particularly large increase and even in Tunisia, where the proportion of people satisfied with their standard of living had improved, the perception was that food insecurity had increased – possibly because dis-satisfaction amongst the poor (for whom food security is a major concern) grew more than dis-satisfaction amongst the rest of the population (ibid p.1).

The link between rising food prices and political unrest is not new or unique to the North Africa region. Historically, rising food prices have often triggered political unrest. Attempts to reduce food subsidies under the auspices of IMF and World Bank economic reform programmes let to riots in Egypt in 1977, Morocco in 1981, Tunisia in 1985 and Jordan in1989 and 1996. Recent research at the University of Adelaide has provided robust empirical evidence for the causal link between rising food prices and political unrest (Arezki and Bruckner 2011)[6] . The link between food prices and civil unrest is supported by other theory and empirical evidence. Acemoglu and Robinson (2001, 2006) have formulated a theory linking transitory economic shocks to democratic transition whilst Berger and Spoerer (2001) have shown that food riots can induce significant political change.

[6] Arezki and Bruckner examined the effects of variations in international food prices on democracy and intra-state conflict using panel data for over 120 countries for the period 1979-2007. They found that for Low Income Countries 'increases in the international food prices lead to a significant deterioration in democratic institutions and a significant increase in the incidence of anti-government demonstrations, riots, and civil conflict' (Arezki and Bruckner 2011 p. 1). No such relationship was found for High Income Countries.

4. Short-term Policy Responses to the Global Food price Shock

The North African governments responded to both the 2007/08 global food price hike as well as to the 2010/11 global food price increases and the political unrest of the Arab Spring in 2011 by introducing a variety of measures designed to cushion the impact of food price inflation. Measures included increasing public sector wages, increasing government expenditure on bread and other food subsidies, reducing tariffs on imported food items as well as increasing direct cash transfers to the poor. But these measures placed a heavy fiscal drain on government budgets and in light of current fiscal problems in the North African economies, the sustainability of these short-term responses is questionable.

Albers and Peeters (2011) analyse the fiscal implications of increased expenditure on food (as well as fuel) subsidies in the immediate aftermath of the 2007/08 global commodity price increases. They argue that in view of the relatively high level and extent of pre-existing subsidies in the Southern Mediterranean region, the impact on public finances of the commodity price increases has been large by comparison with other regions. Tables 7 and 8 summarise their data for the four North African countries in their sample, Egypt, Algeria, Morocco and Tunisia.

Tables 7 and 8 illustrate that for Egypt, Algeria and Tunisia food subsidies as a percentage of GDP increased during 2007 and 2008, reaching 1.8% of GDP in Algeria (in 2009) and over 2% in Tunisia (2008) and Egypt (2009). In Morocco, however food subsidies as a percentage of GDP fell during the global food crisis. The combination of food and fuel subsidies as a percentage of current government expenditure also increased dramatically for all four countries during 2007 and 2008, particularly in Egypt where they reached 30.9% of current government expenditure in 2008, but also in Morocco and Tunisia where they reached 19.9% and 17.7% in 2008[7]. As global commodity prices fell in 2009 there was some easing of the fiscal pressures caused by subsidies (except in Algeria), but the second peak in global prices in 2011 brought renewed pressure.

Table 7 : Food Subsidies as % GDP 2002-2010 in Four North African Economies

	Algeria	Egypt	Morocco	Tunisia
2002	0.0	1.2	n/a	0.6
2003	0.0	1.2	0.4	0.5
2004	0.0	1.7	0.4	0.6
2005	0.0	2.1	0.7	0.6
2006	0.0	1.5	1.0	0.7
2007	1.8	1.3	-1.2	1.2
2008	1.5	1.8	0.8	2.1
2009	1.8	2.0	0.1	1.6
2010	n/a	1.4*	0.6*	1.4*

*Note: *=estimates.*
Source: Albers and Peeters 2011, Boxes 3 and 4.

[7] Egypt and Morocco spend more on fuel subsidies than on food subsidies, whilst Tunisia spends more on food subsidies.

Table 8 : Food and Fuel Subsidies as % of Government Current Expenditure in Four North African Countries

	Algeria	Egypt	Morocco	Tunisia
2002	0.0	4.6	n/a	4.1
2003	0.0	4.8	4.9	3.5
2004	0.1	6.7	7.2	5.1
2005	0.1	8.1	8.8	11.8
2006	0.2	27.4	10.7	13.6
2007	9.9	25.2	12.4	15.7
2008	7.0	30.9	19.9	17.7
2009	7.7	27.2	7.8	11.6
2010	n/a	26.2	8.9	11.0

Source : Albers and Peeters 2011, Boxes 3 and 4.

Breisinger et al (2011a) provide a more comprehensive assessment of the response of Arab governments, both to the 2007/08 global food price increase and to the 2011 political uprisings combined with the second round of global food price increases of 2010/11. Their results for the North African countries in their sample are summarised in Table 9.

Table 9 : Government Responses to 2007/08 Global Food Crisis and 2011 Uprisings

	Reduction of import tariffs	Increase of energy or food subsidies	Reduction of taxes	Increase of public sector salaries	Increase of targeted transfers to poor	Increase of other social transfers	Budget balance as % GDP
Mineral resource rich							
Algeria	B	A B	B	B		B	-2.7
Libya	B	B	B	B		B	9.2
Mineral resource poor							
Egypte	A B	A B		A	A		-8.1
Morocco	A	A B					-4.2
Tunisia	A	A B			B	B	-1,.2

Note: A = a response to 2007/08 global food crisis, B = response to 2011 political unrest.
Source: Breisinger et al 2011, Table 1.

Table 9 shows that the governments of the two mineral rich North African countries, namely Algeria and Libya, did not respond to the global food price increases of 2007/08, with the exception of Algeria's increase in food or energy subsidies. However, in the face of the 2011 political uprisings both countries introduced a variety of measures in an attempt to improve living standards and appease restive populations – both countries reduced import tariffs on food, increased subsidies, reduced taxes, increased public sector salaries and increased social transfers. By contrast, the mineral poor countries, namely, Egypt, Morocco and Tunisia were much faster to act and in response to the events of 2007/08 introduced measures such as reducing tariffs on food imports, increasing subsidies, increasing public sector salaries in the case of Egypt and Morocco, and increasing targeted transfers to the poor in the case of Egypt. They also repeated a number of these measures during the political uprisings of 2011.

With the exception of mineral rich Libya, these costly fiscal measures were undertaken in the context of budget deficits, with Egypt in particular witnessing a high level of fiscal stress with a budget deficit of 8.1% of GDP in 2010, and Morocco also experiencing a significant deficit of 4.2% of GDP. As these North African economies start to shrink in the face of the adverse economic effects of the political unrest of 2011, fiscal pressures are likely to grow and the sustainability of these fiscally costly measures is questionable. We return to the issue of reforming public expenditure on social protection in the light of fiscal problems in Section 5 below where we discuss possible longer term responses and reforms in light of the food security challenges facing North Africa.

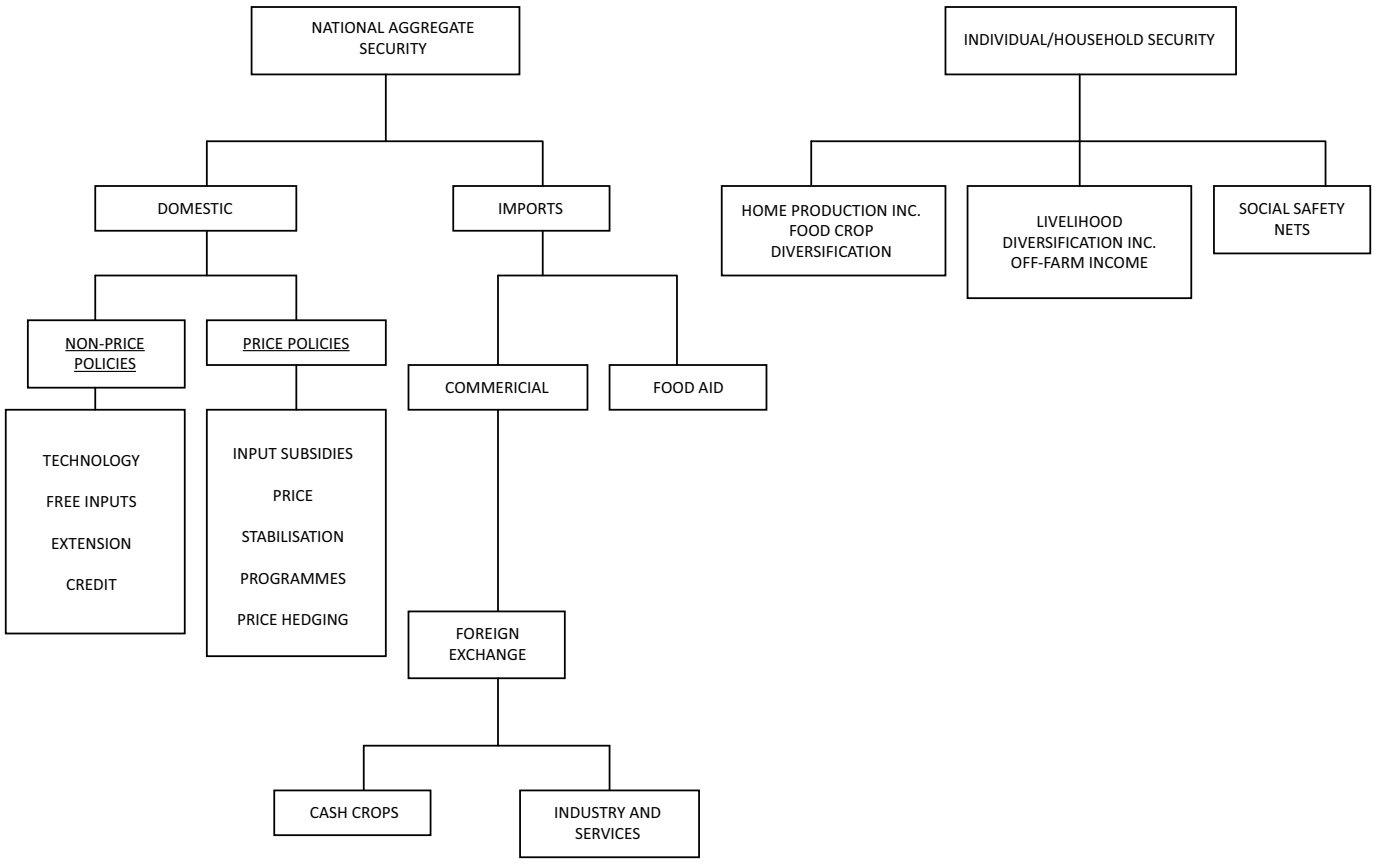
5. A Longer Term Food Security Strategy for North Africa

5.i. Strategies

Traditionally there have been three basic ways that a country can achieve food security at the national level – via domestic production, commercial food imports, or food aid. A strategy relying purely on the first option is synonymous with national food self-sufficiency and in the past, policy makers have sometimes wrongly confused food self-sufficiency with food security (Harrigan 2003, 2005). But food self-sufficiency is only one route to food security and in reality most countries are forced to rely on a combination of domestic production and imports, sometimes supplemented by food aid.

Figure 8 provides a taxonomy of strategies, and polices under each strategy, that can combine to make up a nation's approach to food security. To the extent that a strategy of domestic production is adopted, a variety of both price and non-price polices can be used to promote domestic food production. If a trade-based strategy of food imports is used, this can be supported by policies which promote the production of agricultural export crops to earn the foreign exchange necessary for food imports and/or polices which develop other foreign exchange earning sectors such as manufacturing and services. Both strategies can be supplemented by food aid. In addition, the MENA response to the 2007/08 global food price shock has produced a fourth innovative strategy not represented in Figure 9, namely the practice of acquiring land overseas to directly source food requirements.

Figure 8 : Food Security Strategies and Policies



Source: Harrigan 2005

At the individual level, households likewise have a choice between own food production or livelihood diversification into other activities with income used to purchase food in domestic markets. This needs to be supplemented by adequate social safety net programmes for households and individuals who would otherwise remain food insecure. Such programmes include food for work, school feeding programmes, targeted food subsidies, direct cash transfers etc.

The discussion of future strategies and policies to improve food security in North Africa is obviously linked to a more general discussion of the broad development agenda. For example, in order to generate the export earnings needed to fund food imports there is a need to diversify and strengthen each country's export base. Economic growth also needs to be inclusive and pro-poor and should create employment opportunities given the region's high level of unemployment, particularly amongst youth. This pattern of growth is necessary if food security is to be achieved at the individual level. As argued in Section 3.iv. the North African economies have registered fairly high rates of economic growth over the past decade, but this growth was neither inclusive nor pro-poor (Harrigan 2011a, Hakimian 2011, Karshenas and Alami 2012).

It is beyond the scope of this paper to discuss all aspects of a broad development strategy needed to diversify the economies of North Africa and generate pro-poor inclusive growth. Instead we will focus on some of the more specific policies that could help to directly improve food security at both the national and household level. The following policies will be discussed:

- Policies to improve access to and cost of imported foods
- Policies to improve agricultural productivity, including food crop production
- Reforming social safety nets

Before discussing the above policies, we first locate them within the current debate concerning the food security strategies for the region.

For the last two decades, the orthodox view on food security strategies for the MENA region, which includes the North African countries, was a view that accepted that food imports would continue to remain an important component of the region's food security strategy. This view was based on predictions that for Arab countries, dependence on food imports will increase by 64 percent in the next 20 years. The IFPRI IMPACT model (IFPRI 2008) and the FAO Food Balance Model (FAO 2006, 2008) both predict that demand for food in the Arab world will grow substantially to 2030 and their food production will not keep pace, leading to increased reliance on food imports, with the greatest increase in cereal imports predicted for Egypt. All countries except Sudan are predicted to remain net cereal importers through to 2030 and the only other MENA country predicted to decrease its cereal imports is Morocco (by 17 percent).

The predicted increased reliance on food imports is due, on the demand side, to strong population growth, income growth and urbanisation. On the supply side, low agricultural productivity growth is predicted for the region. This is largely due to factors relating to natural resource endowments – projections show that by 2050 renewable water in MENA will fall to an average of 500 cubic meters per capita and arable land to 0.12 hectares per capita (World Bank 2009). Climate change is also predicted to reduce water availability in MENA via reduced rainfall which will adversely affect both crop area and yields (Cline 2007).

A predominantly trade-based approach to food security is advocated by many analyst and international organisations. For example, the joint report of the World Bank, FAO and IFPRI (World Bank 2009) states that the challenge facing the MENA region is "to find the best ways to improve food security, whilst recognising that there will be a continued and increasing dependence on imports." This is further echoed in the 2008 World Development Report (World Bank 2008) and IFPRI (2010a), ESCWA (2010), Lofgren and Richards (2003), Richards and Waterbury (2006), FAO (2008), DeRosa (1995), Allan (1998).

An increased reliance on a trade-based food security strategy has implications for future resource allocation in the MENA region. Within the agricultural sector, international organisations are advocating a shift away from domestic cereal, dairy and meat production towards production of tree crops, vegetables, fruit and semi-arid crops, which make more efficient use of water and which can be partly destined for export markets. This is based on the need to save scarce water and maximise the returns to water use[8]. Hence, within agriculture the policy advice

[8] Vegetable production yields six times more value added per drop of water than wheat production, and ten times more than beef. Yet in the Maghreb 40 percent of irrigated land is devoted to cereal, 51 percent in the Mashreq and 73 percent in GCC.

is to shift away from water intensive food crops towards more water efficient agricultural exports, with the foreign exchange earned from such exports helping to fund a higher level of food imports. This type of approach is sometimes known as Virtual Water Trade (Allan 1998) – whereby water scarce countries should import water intensive goods. However, due to price distortions in water scarce countries such as trade protection, price supports, and subsidized credit, energy and water, all of which encourage excess water use for irrigation, water scarcity currently plays only a small role in determining global trade patterns (African Development Bank 2011).

In addition to changing the structure of agriculture towards export crops, another strategy is export diversification into industrial and manufactures for export in order to earn foreign currency to import food. This should form part of any sensible strategy since ecological constraints in the MENA region limit the potential of agriculture[9]. As a result of constraints to agricultural production, the agricultural sector in MENA contributes only 12 percent to the region's GDP yet uses over 80 percent of water as compared to 4 percent used by industry (IFPRI 2010a, Table 5). The extent to which countries will need to rely on sectors other than agriculture to help achieve food security varies, particularly according to their availability of water resources.

Reliance on non-agricultural exports as a route to food security via food imports requires both an expansion and diversification of exports from the region. IFPRI (2010a) argues that a commonly used measure of food security at the macro level is the ratio of total exports to food imports. This ratio is low for MENA. Over the past two decades manufacturing exports as percentage of total exports have been declining showing a lack of export diversification[10] .

In addition, the fact that the region's exports are concentrated, with approximately 70 percent of the region's export earnings coming from oil, exposes the region to food security risks via fluctuations in oil prices.

Lofgren and Richards (2003) argue that in a trade-based food security strategy, labour-intensive exports can play a crucial role, not only as a source of foreign exchange but also by boosting real wages of poor people. Since the scope for increasing wages and employment in agriculture is limited they advocate a focus on manufacturing and to a lesser extent services to promote pro-poor, labour-intensive, export-orientated growth[11].

Despite the above policy orthodoxy, the recent global food price increases mean that countries in MENA are starting to question a reliance on a trade-based food security strategy. In addition, as new regimes come to power in North Africa there is a question mark over the extent to which they will want to remain reliant on a global food market dominated by five key players. As a result, governments throughout the MENA region are starting to focus on the concept of "food sovereignty" as opposed to "food security", whereby the former includes the political dimensions of power and control over food supplies (Harrigan 2011b, Harrigan 2012 forthcoming). The desire for sovereignty over food supplies means that governments are less willing to rely on international markets for their food via imports. Instead, as in the 1970s and 80s (Weinbrum 1984), they are considering greater levels of domestic food production as part of their national aggregate food security policies.

Morocco, Egypt and Algeria have all launched new initiatives for their agricultural sector in response to the global foods crisis of 2007/08, all of which emphasise the development of the agricultural sector as a key route to achieving food security. Morocco adopted a strategy to tackle food insecurity in 2008 which prioritised the agricultural and water sector. Likewsie, Egypt adopted the "Strategy for the Sustainable Agricultural Development (SADS) towards 2030" (Arab Republic of Egypt 2011). This new strategy aims is to achieve food security by modernising Egyptian agriculture and improving the livelihood of rural inhabitants through the efficient use of development resources[12], the utilisation of geopolitical and environmental

[9] 83 percent of land in the Arab MENA receives less than 4 inches of rain annually and among these countries all but Syria, Sudan and Tunisia have over 50 percent of their land classified as desert, waste or urban (Wilson and Bruins 2005).
[10] In MENA manufacturing still only accounts for 13.4 percent of GDP whilst the service sector is dominated by domestic activities and public services rather than exports (IFPRI 2010a). Also, with the exception of Tunisia and Turkey, the share of manufactured goods in exports remains below the average for middle income countries (Lofgren and Richards 2003) and that this needs to be improved to help a trade-based food security strategy.
[11] Lofgren and Richards (2003) also argue that it is wrong to conflate national food security with food self-sufficiency in drought prone countries which characterise North Africa since this wrongly assumes that domestic production is a less risky mode for satisfying domestic demand than is dependence on international trade. They argue that the empirical evidence shows that cuts in domestic grain supplies due to droughts in MENA are far more significant than cuts in import supplies due to embargoes.
[12] Although Egypt is emphasising domestic food production she has also recently adapted her production strategy to save water and preserve resources. For example there is a new focus on poultry production rather than beef production and a recent cut in the area planed with rice, all of which is policy driven.

advantages, and the comparative advantages of the different agro-ecological regions. The strategy pursues several strategic objectives, among them the sustainable use of agricultural natural resources, the improvement of the competitiveness of the agricultural products in local and foreign markets, higher rates of food security in strategic goods, better opportunities for agricultural investment and the improvement of the living standards of rural inhabitants. Algeria has also drawn up a 5 year programme for agricultural renewal (Government of Algeria 2011), with the focus being on agriculture to achieve "sustainable national food security and sovereignty". The programme has three complementary components: agricultural renewal; rural renewal; and human capacity building and technical support to producers.

Although from a political and strategic point of view, an approach to food security and sovereignty in North Africa that emphasises agriculture and domestic food production may be justified, in that it can help reduce vulnerability to international markets and reliance on other countries, it can come at a high economic cost (Harrigan 2012 forthcoming). The economic costs of such a strategy vary from country to country, although in general the resource endowments of most North African countries are not well suited to food production, particularly cereal production, and their comparative international advantages lie in other economic activities (World Bank 2008, p235).

In addition to refocusing on domestic food production, many MENA countries are moving towards a new and innovative food security strategy which involves acquiring land in water and land abundant third party countries to directly grow food for the home market. In North Africa, Egypt and Libya have recently engaged in such activities as shown in Table 10.

Table 10 : Land Acquisition Overseas by North African Countries

Target country	Investor country	Nature of deal	Status of deal	Date announced/ signed	Date of media report
Mali	Libya Gov. to Gov.	100,000 ha secured for rice	Signed	n.a.	April 09
Sudan	Egypt Gov. to Gov.	Land secured to grow 2 million tons wheat annually	Signed	n.a.	June 08
Ukraine	Libya Gov. to Gov.	247,000 acres or hectares secured	Signed	Nov 08	Dec 08

Source: Von Braun and Meinzen-Dick 2009

Other International Finance Institutions (IFIS) are starting to recognise that dependence on food imports has implications for food security, since reliance on international markets raises concerns about both price and supply shocks. Recently the World Bank stated that "Policy-makers need to develop a comprehensive strategy that balances the risks associated with imports with the increasing costs associated with increasing domestic production", (World Bank 2009 p.17).

Within the context of the above debate on appropriate strategies to achieve both food security and greater food sovereignty, we now discuss more specific policies which could help to enhance the food security position of the North African countries.

5.ii. Better Integration into Global Food Markets

Even if the North African economies significantly increase their domestic food production and/or their direct access to food via land acquisition overseas, they will still rely on imports for part of their food supplies particularly cereals, with only Morocco predicted to experience declining demand for imported cereals over the next twenty years. Hence, there is a need to introduce measures that will strengthen their position in global food markets and reduce their vulnerability to price and supply shocks. The World Bank/IFAD/FAO report (World Bank 2009) suggests a number of ways in which MENA countries could reduce their exposure to international market and price volatility for imported

foods. This includes: improving supply-chain efficiency to reduce cost and improve food distribution; developing virtual stockpiles of food for example via financial reserves and forward options rather than relying on physical stockpiles; making greater use of formal risk markets to insure transactions in global food markets; and improved regional cooperation. These recommendations are echoed in the recent Economic and Social Commission for Western Asia (ESCWA) report (ESCWA 2010).

Given that much of the food imported into North Africa consists of bulky cereals, a large part of the final cost is due to international and domestic transport, warehousing and storage costs. ESCWA (2010) argues that countries in the Economic and Social Commission for Western Asia (ESCWA) region, (which includes Egypt as the only North African country) tend to perform worse than other Middle Income Countries in terms of trade development indicators such as the World Bank's Logistics Performance Index. This is partly due to lack of integration of border services and inspections, lack of simplified procedures for transit freight, the poor state of railways and roads, inefficient and lengthy border clearance procedures, and lack of ability to trace and track consignments. Table 11 shows the Logistics Performance Index (LPI)[13] for the four North African countries included in the World Bank's sample. As evident in the Table, there is considerable scope for all four countries to improve their trade logistics. This is particularly true for Algeria and Libya who rank 130th and 132nd out of 155 countries and have a LPI below the average for the MENA region as a whole as well as below the average for Lower Middle Income countries (when they are Upper Middle Income) and below the East Asia Pacific region. A scatter diagramme indicates that there is a positive relationship between the LPI and food security with the latter measured by the Global Hunger Index (ESCWA 2010, Figure 20). Hence, reforms to improve trade logistics in North Africa may well have a beneficial impact in terms of food security.

Table 11: Logistics Performance Index

Country	LPI	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
Algeria	2.36 (130)	1.97	2.06	2.7	2.24	2.26	2.81
Egypt, Arab Rep.	2.61 (92)	2.11	2.22	2.56	2.87	2.56	3.31
Libya	2.33 (132)	2.15	2.18	2.28	2.28	2.08	2.98
Tunisia	2.84 (61)	2.43	2.56	3.36	2.36	2.56	3.57
Middle East & North Africa (regional average)	2.6	2.33	2.36	2.65	2.53	2.46	3.22
East Asia & Pacific (regional average)	2.73	2.41	2.46	2.79	2.58	2.74	3.33
Lower middle income (income average)	2.59	2.23	2.27	2.66	2.48	2.58	3.24

Source: http://info.worldbank.org/etools/tradesurvey/mode.
Note: Ranking is 1-5 with 5 the best score. Figure in brackets is each country's LPI ranking out of a total of 155 countries surveyed.

[13] The Logistics Performance Index is based on a worldwide survey of operators on the ground (global freight forwarders and express carriers), providing feedback on the logistics "friendliness" of the countries in which they operate and those with which they trade. They combine in-depth knowledge of the countries in which they operate with informed qualitative assessments of other countries with which they trade, and experience of global logistics environment. Feedback from operators is supplemented with quantitative data on the performance of key components of the logistics chain in the country of work. The LPI consists therefore of both qualitative and quantitative measures and helps build profiles of logistics friendliness for these countries. It measures performance along the logistics supply chain within a country and offers two different perspectives: International and Domestic.

The above argument is echoed by Lampietti et al (2012). They study the Wheat Import Supply Chain (WISC) in ten Arab countries, which include the North African countries of Egypt, Morocco and Tunisia, and compare this to the reference countries of the Netherlands and South Korea. The WISC covers the supply chain from unloading at the port to bulk storage at the flour mill (unloading at port, transport to inland silo, storage at inland silo, transport to flour mill, and bulk storage at flour mill). For 2009 they found that the average WISC costs for the ten Arab countries was $40 per MT of wheat[14], which is up to four times that of the Netherlands, with the highest costs recorded by Egypt and the fifth highest by Tunisia. Given that most of the North African countries will continue to rely heavily on grain imports, there is considerable scope to reduce the cost of imported food by investing in infrastructure to store and transport food, and generally improve the management and logistics of food imports.

Countries that rely heavily on food imports, particularly for grains, can also mitigate against price and supply shocks in international markets by holding a strategic grain reserve which can be used both for emergency aid during a shock or as a buffer to stabilise prices. As an alternative to the costly holding of physical grain reserves there is scope for countries to use financial instruments to create virtual stockpiles of food i.e. by using futures contracts and option contracts. The United Nations High-Level Task Force on the Global Food Crisis has recommended that countries hold food reserves to help stabilise domestic prices, but it has argued that it would be better to hold regional stocks or make food reserve agreements. ESCWA (2010 p.91-2) has suggested that Port Said in Egypt could be one location for a regional food reserve not just for North Africa but the entire MENA region.

It is not just with regard to strategic grain reserves that there is scope for greater regional cooperation in North Africa and MENA. As MENA countries are the single largest group of cereal importers there is potential for economies of scale via multinational procurement and MENA countries as a group could do more to monitor world and regional cereal demand and supply to foresee price shocks. Linked to this is the need for better monitoring of national food demand and supply in MENA. The League of Arab States has proposed a regional food security and early warning system to help predict quantity and location of any needed assistance and this could work with established institutions that already monitor food supplies such as the FAO. For the North African countries, the Arab Maghreb Union, established in 1989 and now committed to introducing a free trade zone, creating a customs union, setting up a common market and establishing an economic community, is the obvious regional body through which to pursue regional food security initiatives.

5.iii. Improving Agricultural Productivity

We have argued above that many of the North African countries are beginning to increase their focus on domestic food production as a route to food security. Improving agricultural productivity (not just in food crop production) in North Africa can contribute to food security in three ways: it can increase the purchasing power of the rural poor via higher incomes from increased productivity enabling them to buy food; it can increase foreign exchange earnings via increased agricultural exports of crops in which the North African countries have comparative advantage so providing foreign exchange to purchase food imports; and it can increase domestic production of food and hence reduce need for imports.

For developing countries in general, agriculture is seen as an important sector in overall economic growth and poverty reduction and therefore productivity growth in the sector plays a key role in the development process[15] (Christiaensen and Demery 2007, Byerlee et al. 2005, Dercon et al 2006, Diao et al. 2007, Mwambu and Thorbecke 2004, Christiaensen et al 2011, World Bank 2008). For example, Christiaensen et al (2011) found that growth in the agricultural sector is up to 3.2 times better than that in the non-agricultural sector at reducing the $1-day poverty headcount in both low-income and resource rich countries. In addition, the relationship between the agricultural sector and food security, through the poverty reduction transmission, is often more direct than for other sectors.

However, a study by Breisinger et al (2012) suggests that the strong link between agricultural growth and poverty reduction does not hold for the Arab countries plus Turkey and Iran (the Arab-TI region). The report finds that although on a global scale there is a strong relationship between agricultural growth and child nutrition (used as a proxy for poverty), this relationship does not hold for the Arab-TI region[16]. From this the report concludes that:

[14] The $40 per MT consisted of: 36% on WISC management; 29% on port logistics; 22% on inland transport and 12% on storage.
[15] It has been estimated that a 10 percent increase in agricultural yields in Africa, is associated with a 7 percent reduction in poverty (World Bank 2008 cited in Foresight 2011, p.127).
[16] In terms of the North African countries in the IFPRI sample, a positive relationship was found for Egypt, Morocco and Tunisia and the negative relationship only held for Algeria.

"…agriculture has not been a driver of poverty reduction and food-security enhancement in the Arab-TI region … revealing scope for improvement in the sector's poverty and food security impact".

The report suggests several structural reasons for the failure of agricultural growth to translate into poverty reduction in the Arab T-I region, including the fact that although about half the population in the region still live in rural areas, the majority earn non-agricultural incomes – for example in Egypt, despite a relatively high share of agriculture in GDP (14%), rural households earn 73% of their income from non-agricultural activities. In addition, in Egypt it is the richer quintiles that earn a higher share of income from agriculture, reflecting factors such as inequality in land and credit distribution. These findings suggest that policies in North Africa to improve agricultural productivity clearly need to be designed to be pro-poor if they are to maximise their impact on poverty reduction and food security, and need to consider asset distribution, and access to credit and other resources as well as human capital development for small and poor farmers. This is reinforced by Christiaensen et al's results (2011) earlier cited, which found that growth in the agricultural sector is better than that in the non-agricultural sector at reducing the $1-day poverty headcount, but only when societies are NOT fundamentally unequal.

If increasing agricultural output in a pro-poor way is to form part of the food security strategy in North African countries, it is essential that the issue of agricultural productivity is addressed. In North Africa there is limited scope to increase agricultural production extensively i.e. via increased use of resources like land and water that are already scarce. Table 12 shows that the available agricultural land per capita in the Near East and North Africa in 2006 was only 1.11 ha/per capita, with nearly a third of this land already under irrigation - the Near East and North Africa region has almost eight times the proportion of irrigated area compared to sub-Saharan Africa. For the North African countries, agricultural land per capita in 2006 ranged from 0.036 in Egypt to 0.259 in Tunisia. However, in the North African countries, with the exception of Egypt, there is potential to increase the amount of land under irrigation since less than 16% of arable land is irrigated in countries like Algeria, Morocco, Tunisia and Mauritania and in these countries the amount of irrigated land has grown by an average of less than 1.5% per annum since 1990 (World Bank 2008).

Table 12: Agricultural Area, Irrigation and Fertiliser Use by Region

	Agricultural area per capita (ha/pc) 2006	Irrigated area (% of arable and permanent crops area)	Fertiliser use (kg/ha of arable land)
Sub-Saharan Africa*	1.47	3.7	14.6
Asia and the Pacific	0.31	33.7	171.6
Latin America and the Caribbean	1.46	11.0	89.3
Near East and North Africa	1.11	28.7	73.1
Total world	0.80	18.0	100.8
Total developed countries	1.34	10.6	82.6
Total developing countries	0.66	23.0	114.3
Algeria	0.22	6.9	13.0a
Egypt	0.04	100.0	572.0
Mauritania	0.12	9.8	n.a.
Morocco	0.26	15.5	52.0a
Tunisia	0.26	8.0	26.0a

Note: a=World Bank staff estimates
*Source: FAO 2005, p. 179 * Excludes South Africa and World Bank 2008*

Resource scarcity means that the North African countries will need to rely on intensive increases in agricultural output i.e. productivity increases in terms of yields per unit of land and water rather than in extensive increases of agricultural production. There is considerable scope to improve agricultural productivity in the North African countries. In addition to the potential to increase irrigated area in countries other than Egypt, fertiliser use could be increased. Although the Near East and North Africa uses more than five times the amount of fertiliser than sub-Saharan Africa, fertiliser use is particularly low in Algeria, as well as being quite low in Tunisia and Morocco. By contrast, fertiliser use is very intense in Egypt (Table 12). Although in the mid-1980s agricultural productivity in MENA started catching up with other net food importing developing regions, largely due to adoption of improved wheat and rice varieties in countries like Syria, Iran and Egypt, more recently productivity growth is again lagging most other regions, except for in the production of fruits.

As shown in Table 13, although cereal yields in MENA exceed those of sub-Saharan Africa, they are still well below the global average and this gap is widening. Between 1990-2007 cereal yields in the Arab world increased by 14.5 percent compared to global average of 21.5 percent. All the North African countries have cereal yields significantly below the developing country average of 28,363 kg/ha as well as being below the regional average for the Near East and North Africa (Table 13). Yields are particularly low in Algeria, Mauritania and Morocco (Table 13). Table 14 also shows that Mauritania, Morocco and Tunisia have all experienced fairly slow annual growth rates of cereal yields of 1.2 percent or less between 1990-2005, with Morocco standing out as particularly poor with a growth rate of only 0.4 percent.

Table 13: Cereal Yields

	Cereal yields kg/ha	
	LPI1992-1994	2002-2004
Sub-Saharan Africa*	10054	10709
Asia and the Pacific	30889	34590
Latin America and the Caribbean	24563	30121
Near East and North Africa**	19647	23609
Total world	28002	31675
Total developed countries	32087	38038
Total developing countries	25518	28363
Algeria	812	1438
Egypt	5918	7545
Mauritania	793	953
Morocco	911	1243
Tunisia	1204	1540

*Note: * Excludes South Africa, ** Afghanistan, Algeria, Bahrain, Cyprus, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya Morocco, Palestinian Territory, Oman, Qatar, Saudi Arabia, Syria, Tunisia, Turkey, UAE, Yemen.*
Source: FAO 2005, p.154 and World Bank 2008

Table 14: Annual Average Growth of Cereal Yield 1990-2005

Country	% Average growth rate
Algeria	3.7
Egypt	2.3
Mauritania	1.2
Morocco	0.4
Tunisia	1.2

Source: World Bank 2008

In order to improve agricultural productivity, including that of domestic cereal production, North African countries need to give greater policy priority to the agricultural sector in terms of both government expenditure and Research and Development (R&D) expenditure. In Asia during the 1980s and 1990s the share of government expenditure devoted to agriculture was regularly between 10-15% compared to less than 5% in most Arab countries. In addition, Arab countries only invest 0.66% of their agricultural GDP in R&D with very little increase since the 1980s. While this is slightly higher than the developing country average of 0.53% it is still well below the recommended level of 2 percent (Alston et al 2000) and is striking in view of the relatively high returns to agricultural R&D in the region – around 36 percent (ibid). For the North African countries for which data is available public R&D spending in agriculture as a percentage of agricultural value added was 0.72 for Egypt, 0.99 Mauritania, 1.0 for Morocco and 0.7 for Tunisia (World Bank 2008). ESCWA (2010, p.81) recommends a regional approach to agricultural R&D given that the MENA countries share similar challenges of water scarcity and climate change and points out that the League of Arab States and UNDP have proposed a regional R&D fund with a committed long term budget (League of Arab States and UNDP 2009). Such a regional approach would reduce fragmentation and produce economies of scale[17].

Agricultural R&D projects in North Africa need to be complemented with measures to ensure more effective and efficient water use (World Bank 2005) and measures to strengthen the position of farmers, especially poor farmers in global and national commodity chains – a study of eight developing countries by Baffes and Gardner (2003) for example, indicates low price transmission to farmers in Egypt.

5i.v. Reforming Social Safety Nets

Regardless of whether North Africa's food security strategy focuses on a trade-based approach or puts greater emphasis on domestic production, as shown in Figure 9, there will remain a need for effective social safety nets to ensure that the poor and vulnerable are able to access and afford food. It is generally acknowledged that social safety nets and social protection policy need to be reformed to become more efficient in the MENA region (Karshenas and Alami 2012, International Labour Office 2010) and the North Africa sub-region is no exception.

Breisinger et al (2012) argue that the Arab T-I countries, particularly the Lower Middle Income Countries (LMIC) in the group, have by far the highest level of spending on social protection of any developing region– more than double that of Eastern Europe and Central Asia and more than four times that of sub-Saharan Africa. In the region, such spending is the largest single government spending account, averaging 5.3% of GDP in LMIC Arab countries. In addition, the social budget grew at an annual average rate of 18.8% per capita between

[17] Egypt is currently investing in a research project to develop new wheat varieties with yields 30% higher than currently available ones, with resistance to several key environmental stresses. The project will include not only crop improvement but also crop management and capacity building components and is led by scientists from Egypt's Agricultural Research Centre (ARC), together with an ICARDA team (ICARDA 2009).

2000-2007 in Arab LMICs, outpacing the growth of all other public spending accounts – in Egypt the annual growth rate was 76.7% and in Morocco it exceeded 10%. Given the reposes to the global food price shocks, where many governments in the region increases subsidies and other welfare related expenditures (see Table 9), spending on social protection has continued to increase. Despite the high level of public expenditure on social protection, estimates of the coefficients of growth-public spending models show that social sector spending in the Arab-TI region is less effective than elsewhere at generating economic growth (Breisinger et al 2012 Table 6). They conculde:

"Findings from the model suggest that spending one additional international dollar in the Arab-TI region yields only about half the growth of a dollar spent in the rest of the world, indicating a large potential for improving the allocation and efficiency of social sector spending in the Arab-TI region."

In addition to the limited impact of social spending on growth, much of the social protection spending in the Arab world is not efficient in alleviating poverty. Expenditure on untargeted fuel and food subsidies, is often higher than more targeted social spending, despite evidence that better-off households often benefit disproportionately from such subsidies compared to more targeted subsidies and interventions which are more efficient and effective in reducing poverty (Coady et al 2006, Coady et al 2010, Breisinger et al 2011, Bacon and Kojima 2006, World Bank 2006).

Social protection reform in North Africa needs to consider moving away from often regressive universal subsidies on food and fuel towards more targeted subsidies. In Egypt, for example, there is a plethora of programmes aimed at reducing the price of staple foods, such as bread price subsidies (Foresight 2011, p.122) and although the government has already introduced targeting into its food subsidy programme, there is still considerable scope to improve the efficiency of such targeting (Coady 2004, Ahmed and Bouis 2002). ESCWA (2010) has argued that five basic targeting mechanisms need to be considered: means testing, categorical and geographical targeting, community-based methods, proxy means testing, and self-targeting; and suggests that lessons be learnt from programmes introduced in South Asia. Examples of targeting include systems that make subsidised food available to selected households via low-price shops in poor neighbourhoods or via ration cards.

In addition to reformed subsidy programmes, labour-intensive public works programmes, especially in rural areas (ESCWA 2010, World Bank 2003), conditional or unconditional cash and/or food transfers (ESCWA 2010, Skoufias 2005, Gertler 2004, World Food Programme 2009) and nutritional support programmes (ESCWA 2010) have often proved to be effective forms of social safety nets which help achieve both poverty reduction and individual food security in many parts of the developing world. Many of these schemes are in place in the North African countries and further work is needed to monitor their impact and improve their effectiveness.

Karshenas and Alami (2012) have argued that social protection in MENA is in need of a total paradigm shift to a fairer, rights-based, systematic approach, but that political regimes in the past have lacked the political will or desire to respond to such a challenge, since the old implicit Social Contract was based on the provision of universal subsidies and state employment in return for loyalty to autocratic regimes. The Arab Spring and the emergence of new regimes in Tunisia, Egypt and Libya now provide an opportune moment to reform the old Social Contract and social safety net programmes so as to make them more effective and efficient. The increasing fiscal deficits in many of the North African countries (See Table 9) make this need all the more pressing. There is already evidence that international organisations are becoming involved in helping new regimes with such reforms (ILO 2011).

6. Conclusion

Food security or food sovereignty in the North Africa region cannot be approached from a purely economic perspective. It also has deep political connotations – as seen by the role that food prices played in the domestic politics of the Arab Spring as well as by the geo-political implications of relying on a small number of international grain suppliers for a large part of the region's food requirements. The Arab Spring combined with the recent global food price shock provide an opportune moment to reassess food security strategies and policies in North Africa.

Although there is some evidence that the region is becoming more concerned with food sovereignty, as reflected in increased interest in domestic food production and land acquisition overseas, food imports will continue to play a significant role in food security for the region, with Morocco being the only country for which cereal imports are predicted to decline over the next twenty years. Hence, future approaches to food security will need to focus on ways in which the North African countries can better position themselves to take advantage of global food markets. This needs to be combined with effective programmes to boost domestic productivity of food production and agriculture more generally, mindful of the economic costs and resource allocation implications of such programmes. In addition, social safety nets and social protection policy needs to be reformed to become more effective and efficient at alleviating poverty and enhancing the food security of poor and vulnerable individuals. This is because food security is intimately linked with income security.

However, the above types of reforms alone will not be adequate to ensure full food security for all citizens in the region. A comprehensive pro-poor, labour-intensive and inclusive growth trajectory is needed for the region and issues of food security cannot be divorced from this broader development agenda. In this respect there is a danger that the recent global food price crisis will trigger a reaction whereby domestic food production and the agricultural sector alone is seen as the panacea for food security. Already countries in the MENA region are starting to respond to the global food crisis by setting-up inter-ministerial food security committees supported by technical units, but these units tend to be located in the Ministry of Agriculture with the committees chaired by the Minster for Agriculture (for example this has happened in Jordan and Yemen). An effective institutional structure needs to place food security at the heart of the development process, with the unit or secretariat located at the highest level of government, such as in the Prime Minister's or President's Office[18]. Such a holistic, multi-agency approach to food security represents the way forward for the new governments of the North African region, and this cannot be divorced from the more general and pressing need for a new type of inclusive socio-economic development strategy.

[18] Mauritania has set-up such a body in the form of The Commission for Food Security, a Governmental body led by a Commissioner with the rank of Minister. Its mission is to fight hunger, underfeeding and malnutrition situations that threaten men, women and children. This was not however established as a response to the 2007-08 food price crisis, as it was formed in 1982.

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