



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*

# Old foods and new consumers in Mexico under economic reforms

Antonio Yúnez-Naude

PRECESAM, El Colegio du Mexico. E-mail: ayunez@colmex.mx

Paper prepared for the Plenary Session: “The changing agrarian structure in Africa: lessons from South America” at the 4<sup>th</sup> International Conference of the African Association of Agricultural Economists, Hammamet, Tunisia.

## 1. Introduction

In the 1980s, the Mexican government instituted wide-ranging market-oriented policies. With respect to the food, agriculture and rural sectors, the reforms ranged from constitutional changes to enhance private property rights in rural “communal” lands, to the elimination of price supports granted to farmers producing staple crops. Policy changes included agricultural trade liberalisation: in 1985, Mexico joined the General Agreement on Trade and Tariffs (GATT), and January 1994 saw the start of the implementation of the North American Free Trade Agreement (NAFTA). At the same time, transitional agricultural policies were being implemented and a comprehensive social programme was initiated to alleviate rural poverty.

The main objective of this paper is to evaluate the performance of agricultural and food production in Mexico during the reforms and NAFTA, as well as the consequences of this performance and of food trade liberalisation on food security, consumption patterns and food poverty. The paper is divided into six parts. Part 2 assesses major agricultural reforms and trade liberalisation under NAFTA, and their expected impacts, as well as new policies that accompanied the reforms. In Part 3, major trends in agricultural production and trade, farm size and yields during the last decades are discussed. Part 4 evaluates the performance of Mexico in terms of food consumption, food security, obesity and poverty. Part 5 utilises these analyses to reflect on the lessons the Mexican experience can offer to other countries at earlier stages of development, and Part 6 concludes.

## 2. Economic reforms

In Mexico, economic policy reforms began in the early 1980s, while the agricultural sector was included in the policy reforms in the late 1980s. Agricultural reforms deepened during the first half of the 1990s in order to prepare the sector for the North American Free Trade Agreement (NAFTA) with Canada and the USA. This agreement was implemented from January 1991. In the mid-1980s, government-supported prices for farmers producing basic crops (barley, beans, maize, rice, sorghum, wheat and oilseeds) were abolished, as were subsidies for agricultural inputs and for credit. In addition, the banking system was re-privatised, public infrastructure to support the marketing of basic crops was sold or abolished, and the Constitutional article related to land property rights was reformed (Table 1; see also Yúnez-Naude, 2003). In addition to these economic reforms, a land or *ejidal* reform was initiated to promote individual property rights to *ejidatarios* (those peasants who benefited from the process of rural land distribution and re-distribution implemented from the 1930s to 1991 after the Mexican Revolution of 1910).

**Table 1: Liberalisation process of Mexico's agriculture**

Policy	Main policy changes	Years(s)
Mexico joins GATT and food import restrictions start to be reduced	Substitution of import controls for tariffication of agricultural goods (tariffs ranging from 0% to 20%)	1986 to 1994
Sale of food state enterprises	Privatisation of state food storage facilities and state enterprises selling seeds and fertilisers at subsidised prices	1988/1989
	Abolition of state enterprises selling coffee, sugar and tobacco	
Ejidal Reform (land property rights reform)	Ending of agricultural land distribution to peasants	1992
	Liberalisation of agricultural land property rights	
Elimination of price supports to farmers producing food staples (the State Trading Enterprise providing this subsidy was abolished in 1999)	Domestic prices of staples determined by taking into account international prices	1989 to date
	Creation of ASERCA in 1991, a marketing support agency granting subsidies (deficiency payments) to producers and buyers of commercial staple crops	
	Creation of PROCAMPO in 1994, a direct income transfer programme to all producers of staples	
North American Free Trade Agreement (NAFTA)	Prohibition of the use of import controls and implementation of tariffication principles	Jan. 1994 to Jan. 2008
	"Free" trade in 15 years. Sensitive agricultural products subjected to tariff rate quotas for a transitional period of up to 15 years	
	Interventions are allowed in the three countries for agricultural subsidies, import restrictions on phytosanitary grounds and rules of origin, and for packing	
Alliance for the Countryside	Group of programmes to promote agricultural and rural productivity, including small farmers	1995 to 2007

The expectation was that NAFTA would lead to price convergence in agricultural products, and hence that Mexico's imports of these crops from its northern partner would increase. These expectations were based on the abolition of price supports for Mexican agricultural producers and the fact that the USA is Mexico's major trade partner, producing and exporting agricultural goods in which Mexico was considered to be non-competitive (basic crops, especially maize, the major staple in Mexico).

Neither the increase in food dependency (decrease of self-sufficiency) caused by rising imports of grains and oilseeds, nor agricultural subsidies for American farmers, worried Mexico's government officials; their expectation was that lower basic crop prices and economic growth would enhance food security in Mexico. With respect to agricultural products in which Mexico is competitive (fruits and vegetables), American (and Canadian) liberalisation of import restrictions under NAFTA would increase Mexico's exports of these goods. Added to the Ejidal Reform, trade liberalisation hence would improve resource allocation and efficiency and agricultural productivity in Mexico.

The general official expectation hence was that, with economic liberalisation and reforms in the rural sector, the average size of agricultural plots would increase, as would agricultural productivity, access to private credit, and investment. Food security would be ensured by cheap imports and the income growth of Mexicans.

Along with economic liberalisation, domestic 'transitional' policies were implemented with the creation of Support Services for Agricultural Marketing (ASERCA), a government institution that provided subsidies to commercial producers and buyers of basic crops, and through PROCAMPO's direct income transfers to practically all farmers producing these crops before the implementation of NAFTA commenced.<sup>1</sup> The third major programme was the "Alliance for the Countryside", implemented from 1995 to 2007. It consisted of government support to enhance rural productivity (Table 1).

<sup>1</sup> PROCAMPO thus is a decoupled programme of pure income transfers.

In addition, the State created specific public policies and institutions aimed at reducing rural poverty – and, implicitly, increasing food access for the poor. In the early 1990s, the Ministry for Social Development was created and a programme for Rural Education, Health and Nutrition (now called *Oportunidades*) began to be implemented in 1997. *Oportunidades* is a well-known conditional cash-transfer programme that includes income transfers for food support to poor mothers, aimed at reducing extreme income poverty, raising the health standards of the poor and promoting human capital formation.

In 2002 the Law for the Sustainable Development for the Rural Sector (LDRS) was created. Amongst other purposes, this Law includes the promotion of food security in Mexico, translated in practice by increasing public expenditure in the rural sector. However, it was not until 2005/6 that food security purposes began its implementation in a more concrete manner by the strategy called Special Program for Food Security (PESA).

### **3. Trends in agricultural production, trade and farm size**

This section evaluates Mexico's performance during the reforms and the accession of NAFTA by reviewing the trends in agricultural production, food trade, food consumption and expenditure, and poverty.

#### **3.1 Production and trade**

Since the 1980s, the performance of agricultural production has been modest. The production of processed food and beverages has performed better, mainly due to the rise of beer production during this period (Table 2).

Field crop production has remained the major component of the agricultural gross domestic product (GDP) since the 1980s, followed by livestock, fisheries and forestry: in late 2000, field crop production accounted for 62% of agricultural GDP, livestock for 30% and fisheries and hunting for the remaining 8%. Maize continues to be the major single crop produced in Mexico. Taking into account the expected impacts of the reforms and NAFTA accession, it is surprising that the production of maize has continuously increased. In addition to maize – but to a lesser extent – other grains remain as major crops produced in Mexico (the exception is rice), whereas the oilseed share of field crop production has decreased sharply. Fresh fruit and vegetables have experienced ups and downs; however, their share of field crop production has remained between 17 and 20% for fruit and between 12 and 14% for vegetables. The volumes of production of major meats and live animals experienced positive rates of growth during the reforms and NAFTA accession. However, poultry is the only component that experienced noticeably high rates of growth during the period.

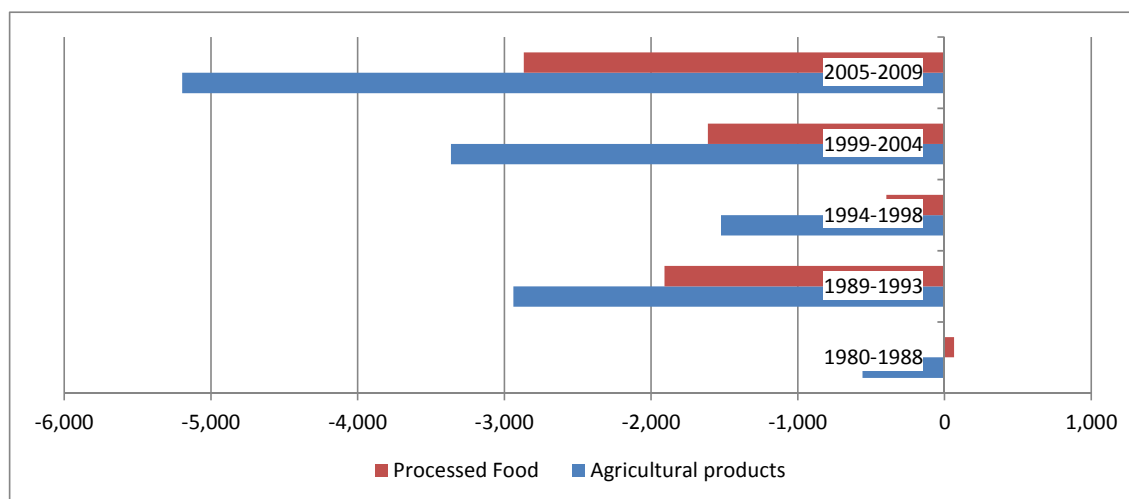
**Table 2: GDP average rates of growth, 1980 to 2010 (2002 pesos)\***

Period	GDP	Agriculture, fisheries and hunting	Field crops and pastures	Livestock	Processed foods and beverages
1980-1988	-0.41	-0.1	0.92	-2.77	1.97
1989-1993	4.06	1.27	2.28	-1.4	5.41
1994-1998	1.6	-1.67	-2.48	0.53	1.59
1999-2004	4.6	0.39	-0.66	2.86	4.02
2005-2008	4.38	5.08	8.11	0.78	3.21
2009-2011	1.55	-1.71	-5.06	2.72	2.48

\*Field crops and pastures, and livestock are part of agriculture, fisheries and hunting

**Sources:** National Institute of Statistics, Geography and Informatics (Instituto Nacional de Estadística Geografía e Informática or INEGI), Banco de Información Económica (BIE)

Agricultural and food trade in Mexico has doubled since the signing of NAFTA, but the value of imports has increased much more than exports, resulting in increasing agricultural and food trade deficits (Figure 1).

**Figure 1: Agricultural and processed food trade balances of Mexico: 1980 to 2009**

(Thousands of US\$ at constant 2005 prices)

**Source:** World Trade Organization website. Conversion to constant 2005 USA prices was done using the International Monetary Fund (IMF) website data on US consumer prices

Table 3 shows the significant increase in imports by Mexico of major food staples and meats from 1994 onwards, and Table 4 contains the evolution of the volume of production of major crops produced in Mexico. For most major crops, rising imports coincide with decreasing or stable domestic production: e.g. imports of oilseeds increased, whereas their domestic production almost collapsed (that of soybeans in particular). Maize is the exception, since maize imports have grown despite the continuous rise in domestic production (this phenomenon is discussed below).

**Table 3: Imports of major basic crops: average simple growth in constant 2005 US\$ 9%\***

Period	Maize	Wheat	Sorghum	Rice	Beans	Oleaginous seeds	Meats**
1980-1988	716 184	182 431	526 048	n.a.	213 057	520 788	76 239
1989-1993	391 133	165 834	552 762	79 933	105 339	589 486	692 736
1994-1998	661 553	374 367	399 786	102 350	71 083	1 039 822	864 566
1999-2004	846 208	505 568	508 796	155 042	45 965	1 112 487	2 094 156
2005-2010	1 537 948	773 454	351 789	274 807	82 743	1 754 693	2 333 138

\*Estimated using USA consumer price index data from IMF website

\*\*Beef, pork, poultry and sheep

n.a. = not available

Sources: 1980-2008, FAO website; 2009-2010, United Nations website on trade

**Table 4: Production of major field crops: 1980-2011 (thousands of metric tons)**

	Crop	1983-1993	1994-2000	2001-2008	2009-2011
<b>Grains and legumes</b>	Rice	478	391.5	269.1	217.7
	Beans	1 033.10	1 165.3	1 188.50	921.8
	Maize	13 553.10	17 998.40	21 371.80	20 360.0
	Wheat	4 145.60	3 485.70	3 208.90	3 806.8
	Barley	528.3	489.7	821.9	559.6
	Sorghum	5 161.00	5 490.00	6 171.90	6 492.5
<b>Oilseeds</b>	Soy beans	677.1	191.1	122.1	164.6
	Other *	636.5	711.2	474.1	405.7

\* Sesame, sunflower and cotton

Source: SIACON/SIAP, website of SAGARPA (<http://sagarpa.gob.mx>)

Livestock production growth was insufficient to satisfy domestic demand and hence livestock trade deficits have increased continuously, especially for beef (Table 5). Mexico also imports meat, parts of meats and offal not demanded by American consumers (hence at very low prices). An example is poultry. Despite a large increase in production in Mexico, the trade deficits in poultry increased, in part because of increasing cheap imports of chicken feet and legs.

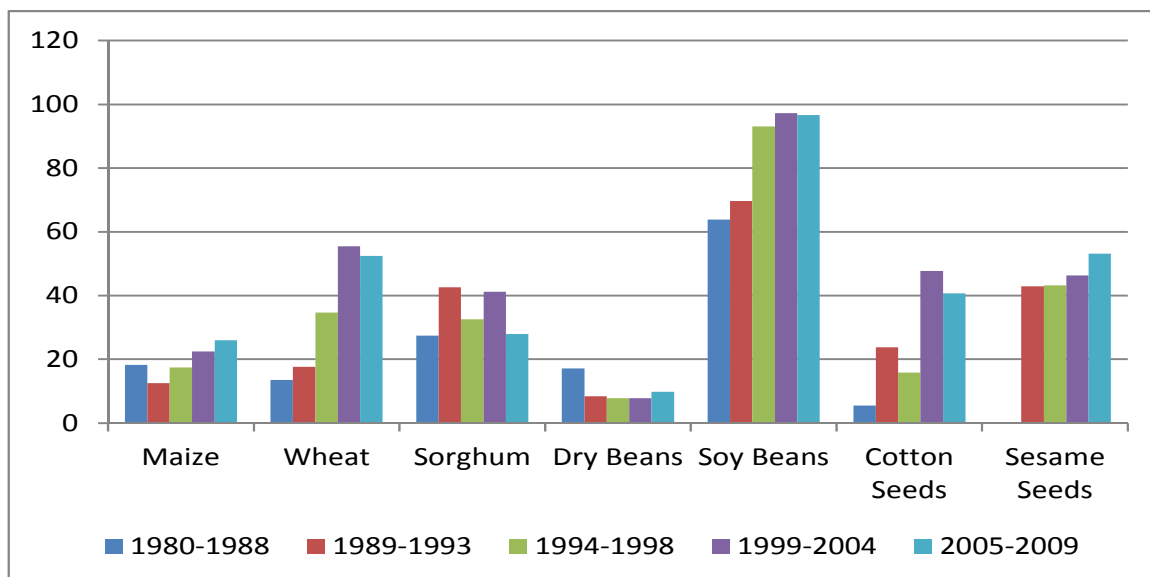
**Table 5: Mexico meat trade balances (thousands of US\$, base 2005)**

	Poultry	Beef	Pork	Mutton and goat
1980-1988	-25.87	-15.34	-13.58	-4.92
1989-1993	-137.93	-321.37	-165.45	-23.35
1994-1998	-288.54	-361.55	-61.78	-34.15
1999-2004	-398.08	-1 026.87	-300.99	-76.01
2005-2008	-634.69	-844.92	-408.03	-63.32

Source: FAO website, constant 2005 US dollars, calculated using US consumer price index data from the IMF website

One way to evaluate the changes in agricultural trade is to estimate “import dependency” (i.e. the ratio of imports with respect to production, plus imports minus exports). The results show that, in terms of volume, import dependency for major basic crops and for meats has increased since the beginning of NAFTA (Figures 2 and 3).<sup>2</sup> However, import dependency for maize, sorghum and beans has remained relatively low since NAFTA, whereas import dependency in the major oilseeds has increased sharply since 1989. Finally, import dependency in major meats has increased.

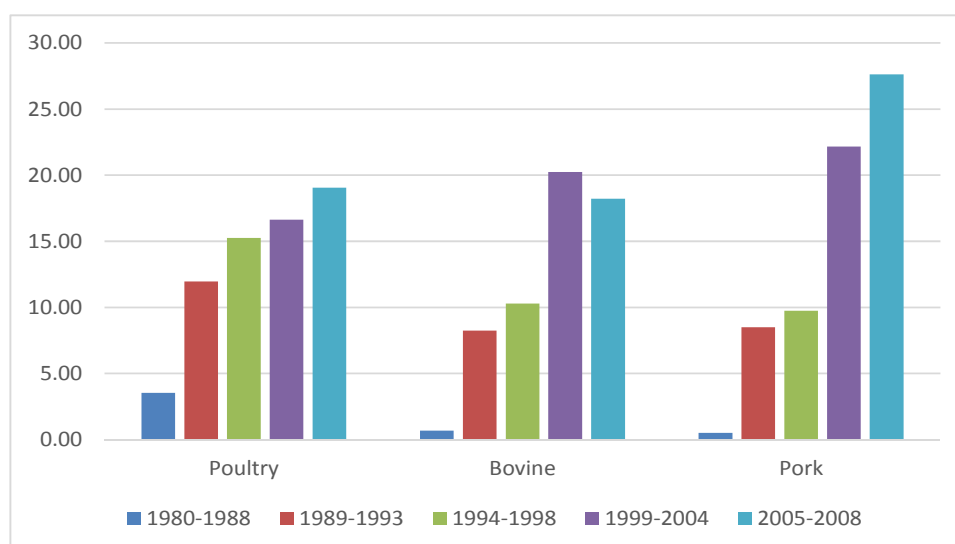
<sup>2</sup> In line with the increase in food dependency, self-sufficiency decreased for major staples, i.e. the ratio between domestic production and domestic production plus imports.



**Figure 2: Evolution of import dependency of major basic crops: 1980 to 2009 (%)\***

\* Import dependency ratio in volume (IDR) = ((Imports)/(Production + imports - exports))\*100

Source: Production: SAGARPA website; Imports and exports for 1980-2008: FAO website; and for 2009: President Calderon annual address 2010



**Figure 3: Evolution of import dependency of major meats: 1980 to 2008 (%)**

Source: Production: SAGARPA website; Imports and exports for 1980-2008: FAO website; and for 2009: President Calderon annual address 2010

### 3.2 Farm size, production and yields

Data from the Agricultural Censuses of 1991 and 2007 (AGC) provide information to describe the structure and evolution of agriculture by the sizes of “farms” (“agricultural units of production” in INEGI’s terms).<sup>3</sup>

From 1991 to 2007 the number of farm agricultural units of production (AUP) decreased by 1.2%. Given that the area covered by these farms experienced a greater reduction (-3.9%), average farm size in Mexico declined from 8.18 to 7.96 hectares, slightly less for plots of less than two hectares,

<sup>3</sup>Agricultural units of production are the set of land holdings with or without agricultural or forestry production in rural areas, or with agricultural and forestry production in urban areas, which are located in the same county or municipality, and under the same administration.

practically unchanged for plots between two and five hectares, and increasing for the remaining farms (Table 6).

Table 6 also indicates the level of heterogeneity in Mexico's agrarian structure. For example, small farms (< 5 ha) accounted for almost 60% of the total number of farms in 1991 and 68% in 2007, but represented less than 16% of total area in both years. By contrast, large farms (> 50 ha) constituted just over 3% of the total number of farms, but covered around 40% of the total area.

There also is evidence that the average size of *ejidal* plots decreased from 8.5 to 7.5 hectares from 1991 to 2007 (Robles 2010). Thus, contrary to expectations about the effects of economic liberalisation and the Land/Ejidal Reform, fragmentation has increased: the number of *minifundia* (small landholdings) has not decreased and the private property rights of former *ejidal* lands for agricultural production have not increased (Garfias 2010).

**Table 6: Quantity, area and size of agricultural units of production (AUP): 1990 and 2007**

Census data	Average size of AUP (ha)		Distribution in total number of AUP (%)		Distribution in total area of AUP (%)	
	1991	2007	1991	2007	1991	2007
Up to 2 ha	1.12	1.09	34.56	44.47	4.71	6.10
From 2 to 5 ha	3.41	3.46	25.35	24.21	10.55	10.51
From 5 to 20 ha	8.78	9.23	31.25	23.16	33.52	26.84
From 20 to 50 ha	20.51	25.26	5.27	5.10	13.22	16.16
From 50 to 100 ha	42.64	51.68	1.77	1.74	9.24	11.32
From 100 to 1000 ha	104.11	130.58	1.67	1.25	21.22	20.45
From 1000 to 2500 ha	351.45	517.82	0.09	0.05	3.70	3.06
More than 2500 ha	710.86	1724.79	0.04	0.03	3.84	5.55
Total of average	8.18	7.96	100.00	100.00	100.00	100.00

Sources: Agricultural Censuses 1990 and 2007

Most farms producing maize in both years were small. However, for Mexico as a whole, medium-sized farms (from 5 to 20 ha) had the highest participation rate in harvested area and production of maize in 2001, while in 2007 the biggest farms occupied this place. In terms of regions, the north-western state of Sinaloa stands out as the major state producing maize during the period of reforms and NAFTA. This is explained partially by the high marketing subsidies granted to the farmers (see also later).<sup>4</sup>

According to AGC, the volume of production of beans declined by 11.5% from 1991 to 2007, with the reduction mainly due to the drop in production by small and medium-sized farms (up to 20 hectares of land), since bigger farms increased their production. However, as in the case of maize, small farmers all over Mexico still grow beans for their own consumption.

Physical production of sorghum increased across all farm sizes from 1991 to 2007. However, most of this cash crop is grown by medium-sized and big farmers, and the weight of the latter in total sorghum production increased sharply during the period (part of this change could be explained by commercialisation subsidies granted to big farmers, especially in the north-eastern state of Tamaulipas - see below).

<sup>4</sup> The characteristics and coverage of AGC data limits the study of the structure of production by farm size and changes in maize, beans, barley, sorghum and wheat, plus some important plantations: coffee, sugarcane and oranges.



From 1991 to 2007 the volume of production of barley almost doubled, an increase explained by the rise in production across all farm sizes. The dynamics of barley production in Mexico during the last decades can be explained largely by the boom in production (and exports) of beer.

The volume of wheat production increased by 4% from 1991 to 2007, largely from medium and larger scale farmers. However, the share of medium-sized farms in the total volume of wheat production declined during the period (from 33% to 19%), whereas the contribution of bigger farms increased from 55% to 75%. These changes are based on the decline in wheat production on medium-size farms (-46%) and the rise in production on bigger farms (41%); most of the latter are located in the northern state of Sonora. As for maize and sorghum, the increase in the production of wheat by bigger farmers in the north could be explained partially by government subsidies, particularly for those located in northern Mexico (Sumner & Balagtas 2007).

Notwithstanding the prevailing high heterogeneity in the structure of land distribution by AUP per size and differentiation in inputs used (small farmers do not use tractors and rely on family labour, Table 6), yields did not differ much across farm sizes between 1991 and 2007 (Table 7).<sup>5</sup>

Coffee, sugarcane and oranges are also produced commercially on all farm sizes in specific regions of Mexico.<sup>6</sup> The study of the evolution of these three crops from 1991 to 2007 shows that production and yields in small and medium-sized plots increased from 1991 to 2007.

**Table 7: Yields of selected basic grains per AUP size, 1991.2007**

	Barley		Beans		Maize		Sorghum		Wheat	
	1991	2007	1991	2007	1991	2007	1991	2007	1991	2007
Up to 2 ha	1.05	2.37	0.31	0.45	1.04	2.09	3.32	6.91	2.24	4.53
From 2 to 5 ha	1.08	2.59	0.34	0.48	0.96	2.39	3.21	5.73	3.27	5.44
From 5 to 20 ha	1.24	2.72	0.44	0.56	1.11	3.21	2.36	5.84	3.47	5.63
From 20 to 50 ha	1.41	2.86	0.48	0.60	1.31	3.86	2.29	5.32	3.73	5.56
From 50 to 100 ha	1.44	2.87	0.52	0.70	1.57	4.81	2.29	5.22	3.51	5.73
From 100 to 1 000 ha	1.36	2.76	0.62	0.74	1.82	5.07	1.89	8.99	3.52	5.94
More than 1 000 ha	1.63	2.52	1.10	0.38	1.87	4.10	1.60	2.32	3.59	4.30

**Sources:** Agricultural Censuses, 1990 and 2007

To understand the evolution of agricultural production in Mexico during the last 30 years one must consider the heterogeneity of agricultural production in combination with the structure of markets and policy interventions.

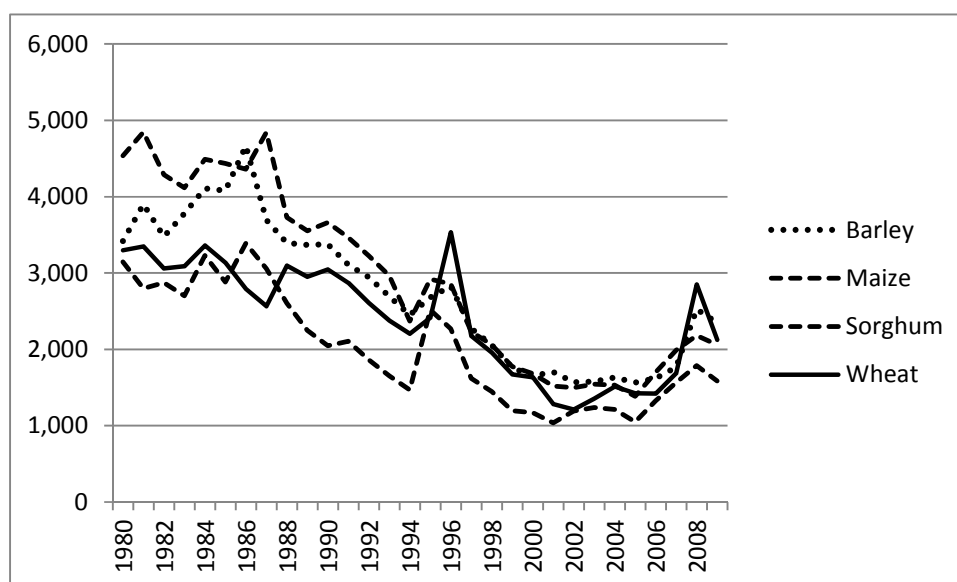
Based on this framework, and on the character of the evolution of the agriculture of Mexico and its agricultural policies, I propose two general hypotheses: a) domestic reforms and accession to NAFTA directly affected commercial farmers producing non-competitive crops, but some of them were protected from American competition by government supports; and b) small producers have maintained or even increased their production of food staples (maize in particular) because of the nature of their decision making, which is explained by the transaction costs they face.

<sup>5</sup> I suspect an error in the 2007 AGC database for sorghum production on the biggest farms. As a result, the figures for yields in sorghum for farms of more than 1 000 hectares may be underestimated, and hence also average yields for total sorghum production.

<sup>6</sup> The importance of these three plantation crops is illustrated by their area coverage in Mexico. Together, coffee, sugarcane and oranges accounted for more than 5% of total area used for agricultural production in 1991 and 2007: coffee and sugarcane with around 2% each, and oranges with around 1% in both years. Together, this coverage is similar to that of sorghum.

Commercial farmers producing non-competitive crops were directly affected by price reductions in basic crops during the mid-1990s and the first half of the current century (Figure 4), and have reacted by increasing productivity or by switching land use. Others have been protected from foreign competition through government supports (Sumner and Balagtas (2007) provide evidence for this). The responses of small farmers to external shocks such as the reduction in maize prices are complex, because they are both units of production and units of consumption facing transaction costs in several markets, and have a diversity of income sources (Singh *et al.* (1986) offer the foundations of these proposals, based on agricultural household models; for Mexico, see Yúnez-Naude (2010)).

I have extended the household model to a microeconomic general equilibrium model applied to rural Mexico, with transaction costs in product and labour markets for subsistence maize farmers. In this way I have shown that a reduction in the market price of maize is indirectly transmitted to these producers through interactions in factor markets. The market price shock directly affects commercial rural households that produce maize, reducing local wages and land rents, and stimulates maize production by subsistence households. I propose that this reaction by subsistence farmers to the observed reduction in maize market prices explains why small-scale maize production in Mexico has not declined (see, for example, Dyer *et al.* (2005, 2006), and below).



**Figure 4: Mexico: producers' price of selected grains (base 2002 = 100)**  
 Source: SAGARPA-SIACON website, deflated using Bank of Mexico consumer price index

The results of Sumner and Balagtas (2007) and of Taylor *et al.* (2007), together with the tendencies described above in relation to production and yields by small farmers, allow us to make the following assertions: notwithstanding economic reforms and trade liberalisation, the production of maize by small farmers has prevailed in Mexico. Furthermore, small farm production of competitive cash crops such as sugarcane and oranges is viable. Finally, these indications show that medium-sized farmers have been able to face the challenges of reforms and trade liberalisation.

#### 4. Food consumption, food security and poverty

The United Nations' Food and Agriculture Organization (FAO) considers that food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life. Food security has four dimensions: availability, access, utilisation and stability. No data exists to evaluate the trends

of these four dimensions in Mexico. However, there is data on consumption of and expenditure on foods.

Trends in per capita consumption of food staples in Mexico indicate that, in general, food security has not worsened since accession to NAFTA. In particular, the available official data indicates that per capita consumption of maize and soy beans, and of all major meats, has increased, while per capita consumption of wheat has experienced no major change (Table 8). In terms of domestic production and trade, these figures suggest the following: the rise in per capita consumption of maize was sustained by domestic production and imports; consumption of wheat is based on domestic production and imports; whereas the increase in consumption of soy beans is based on imports. The rise in the per capita consumption of meat is based on both domestic production and imports, although the share of these two sources differs: domestic production and trade balances in meats indicate that the increase in beef consumption is dependent more on imports.

**Table 8: Per capita consumption of selected basic crops and major meats: 1980–2009 (kg)**

	Maize	Wheat	Sorghum	Beans	Soy beans	Poultry	Beef	Pork
1980-1985	224.20	64.70	109.90	17.40	22.20	7.00	14.40	17.80
1990-1995	225.80	48.60	86.70	16.30	22.00	12.90	14.90	10.10
2000-2005	236.70	59.60	96.90	9.20	39.50	25.60	18.00	12.90
2006-2007	287.30	59.30	77.00	12.20	35.80	29.60	18.50	13.60
2008-2009*	283.70	50.70	78.30	11.10	33.60	30.30	18.80	14.30

\*Figures for meats are for 2008

**Sources:** Population, 1985-2009: Banco de Mexico; 2010: INEGI Population Census; production: SAGARPA website; Imports and exports: FAO website

It is worth noticing that per capita consumption of wheat decreased considerably during 2008/2009, as well as the consumption of maize and soy beans. These decreases coincide with the rise in international food prices in 2006/2007.

To extend the study on the trends in food security in Mexico during the reforms and NAFTA I used the National Income and Expenditure Household Surveys (ENIGH).<sup>7</sup> This shows that the period of reforms has witnessed no change in the proportion of Mexican household per capita expenditure on foods, including maize and wheat, the major food staples in Mexico. However, the share of expenditures on “other grains” increased, while that of fruits and vegetables and meats decreased in 2010 compared to 1992 (Table 9).

<sup>7</sup> Since 1992, the ENIGH have been carried out by Mexico’s National Institute of Statistics, Geography and Informatics (*Instituto Nacional de Estadística Geografía e Informática*, or INEGI) every two years.

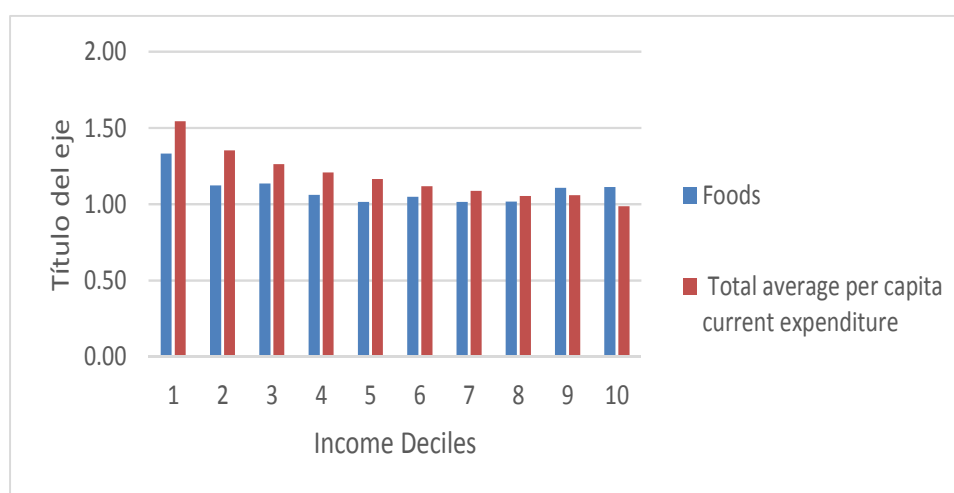
**Table 9: Per capita expenditure on food (percentages)**

Year	Participation of food in total expenditure	Participation in total food expenditure*					
		Maize	Wheat	Other grains	Beans	Fruit and vegetables	Meats
1992	25.14	7.20	5.70	0.93	2.94	12.00	19.22
1994	23.98	6.35	5.44	1.06	2.53	11.05	17.65
1996	25.73	7.69	7.01	1.25	3.92	10.35	16.76
1998	24.80	7.38	6.01	1.23	3.14	10.88	16.60
2000	24.38	7.23	5.41	1.05	1.95	10.54	14.90
2002	23.75	7.61	5.49	1.24	2.10	11.67	14.61
2004	21.67	6.13	5.26	1.38	1.40	9.45	12.90
2006	21.66	6.08	5.15	1.41	1.34	9.66	12.20
2008	24.54	6.65	5.84	1.56	1.52	9.50	12.21
2010	25.29	6.69	5.49	1.50	1.49	9.82	12.35

\*Includes processed foods

Sources: INEGI (National Income and Expenditure Household Survey) for the reported years

If we consider per capita expenditure on food by income decile, the data indicate that expenditure on foods increased from 1992 to 2010, especially for the poorest first three deciles: by 1.33 times, 1.12 and 1.14 times for deciles 1, 2 and 3 respectively (Figure 5).<sup>8</sup> In terms of absolute changes in expenditure by decile and major foods (Table 10), the foods that show the highest increase are “other cereals”, independently of the income decile. This is especially significant in poor households (e.g. in 2002, pesos expenditure in this group of foods increased 18 and 20 times for decile 2 and 3 respectively).



**Figure 5. Per capita expenditure: Total and foods by income decile; absolute changes 1992 to 2010 (2002 pesos)**

\* Deciles of per capita current income

Sources: INEGI (National Income and Expenditure Household Survey) for the reported years

<sup>8</sup> During the period, total expenditure increased more for all deciles, except for the richest one.

**Table 10: Per capita expenditure on major foods by income decile: absolute changes 1992 to 2010 (2002 pesos)\***

Major foods	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 7	Decile 9	Decile 10
Maize	0.78	0.88	1.02	0.99	1.04	1.07	1.07	1.17	1.13	0.96
Wheat	1.88	1.03	1.15	1.10	1.08	1.06	1.04	0.94	1.01	0.90
Rice	1.20	1.00	0.97	0.88	0.89	0.82	0.70	0.77	0.69	0.59
Other cereals	9.26	17.80	19.90	13.48	14.33	11.49	7.37	8.13	13.22	6.77
Beans	0.66	0.57	0.54	0.51	0.56	0.54	0.56	0.48	0.49	0.50
Vegetables	1.18	1.08	1.13	0.92	0.90	0.90	0.85	0.81	0.82	0.79
Fruits	1.59	1.10	1.08	1.05	0.88	0.78	0.87	0.75	0.76	0.87
Beef	1.77	1.18	0.92	0.82	0.68	0.64	0.59	0.59	0.57	0.41
Pork	1.27	0.82	0.91	0.79	0.72	0.63	0.63	0.60	0.52	0.43
Poultry	1.21	1.08	1.02	0.90	0.85	0.92	0.77	0.75	0.83	0.78
Other foods	1.80	1.38	1.32	1.25	1.18	1.26	1.22	1.23	1.36	1.34

\* Deciles of per capita current income

Sources: INEGI (National Income and Expenditure Household Survey) for the reported years

Table 10 also shows that expenditure on maize experienced no major changes in all deciles during the period, whereas expenditures on beans – the other major staple in the diet of Mexicans – decreased for all deciles. It is worth noting that expenditure on fruit and vegetables and meats increased for the poorest deciles (1 and 2), and decreased for middle-income and richer households (deciles 5 to 10). Finally, all households increased their consumption of “other foods”.

To complete the account of changes in consumption, I estimated the changes in the proportion of households’ total budget spent on foods by decile and group of foods between 1992 and 2010. Table 11 indicates that, in 1992 and 2010, maize was the major staple for poor households (deciles 1 to 3), whereas the consumption of beef increased with household income. However, the weight of maize decreased for the poorest households (deciles 1 and 2) in 2010, and remained practically unchanged for the remaining household groups. During this period, expenditure on wheat remained practically the same for all households with the exception of the poorest (decile 1), whereas expenditure on rice and beans declined in all households.

Expenditure on “other cereals” grew for all households, although it remained proportionally low in 2010. Expenditure on vegetables and fruit declined slightly in all household groups, the exception being households in decile 1.

As for household’s share of expenditure on meat, beef expenditure increased for the poorest households (1 and 2) and declined for the remaining households, whereas expenditure on pork and poultry declined for all households. Finally, the share of “other foods” in the food budget of all households grew considerably, between 6.8 points (decile 3) and 12.89 points (decile 10). The poorest households increased their expenditure on other foods (by 12.45 points). These trends indicate that *oportunidades* have contributed to rising food expenditure amongst the poor, while middle and upper income households seem to have satisfied their food consumption needs. Consumption of “non-traditional” foods, including processed and junk food, increased in all households.

**Table 11: Distribution of food expenditure in total expenditure, by income decile (1992 to 2010)\***

Year	Maize	Wheat	Rice	Other cereals	Beans	Vegetables	Fruit	Beef	Pork	Chicken	Other foods
Decile 1											
1992	21.90	5.16	1.89	0.08	10.25	11.37	1.98	3.30	1.96	6.44	35.68
2010	12.75	7.28	1.71	0.54	5.06	10.06	2.36	4.38	1.87	5.86	48.13
Decile 2											
1992	16.51	7.37	1.47	0.04	7.63	9.99	2.58	5.53	3.07	7.14	38.68
2010	12.93	6.77	1.31	0.62	3.89	9.57	2.54	5.82	2.24	6.86	47.46
Decile 3											
1992	12.92	6.74	1.27	0.04	6.05	9.15	2.88	7.67	2.84	7.24	43.18
2010	11.63	6.84	1.09	0.74	2.89	9.07	2.74	6.24	2.28	6.49	49.98
Decile 4											
1992	11.48	6.37	1.15	0.06	5.00	9.58	2.87	9.02	3.22	7.26	43.98
2010	10.66	6.62	0.95	0.82	2.41	8.31	2.85	6.95	2.40	6.16	51.87
Decile 5											
1992	9.45	6.45	0.95	0.56	3.95	8.94	3.49	10.65	3.28	7.21	45.56
2010	9.67	6.89	0.84	0.90	2.20	7.94	3.01	7.14	2.31	6.06	53.03
Decile 6											
1992	8.16	6.24	0.90	0.07	3.00	8.94	4.26	11.29	3.47	6.51	47.16
2010	8.31	6.29	0.71	0.77	1.55	7.63	3.18	6.94	2.09	5.73	56.80
Decile 7											
1992	6.75	6.06	0.84	0.11	2.51	8.08	3.99	12.37	3.07	6.78	49.44
2010	7.12	6.23	0.57	0.82	1.38	6.80	3.41	7.18	1.90	5.13	59.45
Decile 8											
1992	5.40	5.90	0.71	0.10	2.13	8.15	4.84	11.51	2.85	6.47	51.93
2010	6.19	5.48	0.54	0.83	1.01	6.49	3.57	6.69	1.69	4.76	62.76
Decile 9											
1992	4.10	5.49	0.64	0.08	1.44	6.90	4.85	11.85	2.77	5.48	56.40
2010	4.18	4.99	0.39	0.95	0.64	5.12	3.32	6.04	1.30	4.10	68.95
Decile 10											
1992	2.20	4.32	0.43	0.02	0.62	5.33	5.17	10.94	1.99	4.18	64.65
2010	1.90	3.49	0.23	1.01	0.28	3.79	4.03	4.01	0.77	2.94	77.54

\*Deciles of per capita current income

Sources: INEGI (National Income and Expenditure Household Survey) for the reported years

The evolution of expenditure on food during the period of reforms, together with the rising trends in wheat and beef import dependency (Figures 2 and 3), show that an increasing portion of households' consumption of these goods comes from abroad (from the USA in particular). To this we must add the increasing expenditure on and imports of processed foods (i.e. other cereals and other foods, Figure 1).

Data on households' expenditure on other cereals and other foods include non-nutritional foods such as snacks and soups (potato chips, sweets, instant soups, etc.).<sup>9</sup> American data on food exports to Mexico show that they have grown continuously during NAFTA (GATS 2013). This tendency, together with the increase in Mexican households' expenditure on other cereals and foods, suggests

<sup>9</sup> The sources of the data do not distinguish sufficiently between these types of processed foods.

that changing food consumption patterns of Mexicans under the reforms and NAFTA explain at least part of the increasing problem of obesity. According to the OECD, Mexico is placed second, just after the USA, in terms of adult obesity and fourth with respect to child obesity (OECD 2013). The question of obesity urgently requires study in the context of economic liberalisation and industrial organisation.

My study of the evolution of consumption patterns of the Mexican population during the last three decades also distinguishes food consumption among urban (i.e. people living in localities with more than 2 500 people) and rural populations. Table 12 shows that the share of per capita expenditure on non-processed foods declined in both rural and urban areas. The weight of expenditure on *non-nutritional foods* more than doubled for the urban population, but by less for the rural population, while the proportion of expenditure on *nutritional processed food* increased for the rural population and decreased for the urban population. These tendencies, especially for the urban population, indicate that changing food consumption patterns explain in part the increasing rates of obesity in Mexico.

The determinants of obesity in Mexico require empirical research. Some suggested hypotheses are the following: a) increased access to non-nutritional food under economic liberalisation and trade (e.g. according to the Foreign Agricultural Service (FAS) of the US Department of Agriculture (USDA), from 1992 to 2012 the value of imports of instant soups and snacks grew almost 11 times (FAS/USD quoted website); b) until recently, no state regulations on food nutritional value and quality standards had been implemented; and c) in Mexico, no value added tax is applied to any type of food.

The findings on the structure and evolution of food expenditure are synthesised in Table 13. This shows that the proportion of total expenditure on foods has declined in almost all household groups according to income deciles. The table also indicates that this proportion increased for several household groups in 1996 compared to 1994, and in 2008 and/or 2010 compared to 2006 for all households. These changes coincide with the macro-economic crisis suffered by Mexico in 1995/1996, when the Mexican peso suffered a deep devaluation against the US dollar, and with the beginning of the period of higher international prices of foods and higher price volatility (Figure 4 and Yúnez-Naude & Aguilar, 2012). Mexico also witnessed an increase in the incidence of poverty during these years.

**Table 12: Distribution of urban and rural per capita expenditure on food, 1992 and 2012\***

Food groups	1992		2012	
	Urban	Rural	Urban	Rural
Maize	7.42	12.27	11.19	13.01
Wheat	7.49	8.22	8.56	8.10
Rice	0.98	1.77	0.78	1.30
Other cereals	0.13	0.12	1.65	0.96
Beef	14.65	8.28	9.38	5.68
Pork	3.91	3.30	3.24	2.65
Poultry	8.00	7.04	7.21	6.56
Vegetables	11.01	12.37	8.89	9.07
Fruits	5.65	3.33	4.82	3.14
Beans	3.24	6.64	2.96	4.72
<b>Subtotal “fresh food”</b>	<b>62.00</b>	<b>63.00</b>	<b>59.00</b>	<b>55.00</b>
Oils	1.42	2.77		2.91
Fats	0.48	1.41	0.22	0.52
Sauces	1.09	1.38	1.18	1.16
Various prepared food	0.00	0.01	0.07	0.04
Soups, pasta, etc.	2.13	1.12	10.69	4.17
Sweets	0.77	0.56	0.67	0.38
Non-alcoholic drinks	5.83	5.97	10.72	8.39
<b>Subtotal expenditure on processed “non-nutritional foods”</b>	<b>11.73</b>	<b>13.21</b>	<b>24.99</b>	<b>17.57</b>
<b>Subtotal “other processed foods”</b>	<b>25.81</b>	<b>23.44</b>	<b>16.34</b>	<b>27.24</b>
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

\* Excludes processed meats, fish and seafood, milk and cheese, eggs, tubers, seeds, tea, chocolate, baby food, alcoholic drinks, honey and coffee

Sources: INEGI (National Income and Expenditure Household Survey) for the reported years

**Table 13: Distribution of food expenditure on total expenditure by income decile, 1992 to 2010**

Per capita income by decile	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010
1	47.6	44.2	49.4	47.2	44.7	47.4	43.3	43.2	40.5	41.0
2	45.5	39.6	42.7	42.1	40.6	38.6	27.4	37.1	37.9	37.7
3	40.0	38.2	40.8	39.9	37.7	36.8	33.7	24.7	35.4	36.1
4	39.1	35.6	38.6	37.2	35.5	34.2	31.9	32.4	33.0	34.4
5	36.8	32.7	35.4	35.3	33.4	31.1	31.0	30.3	31.4	32.0
6	32.0	30.8	33.3	32.6	31.4	29.2	28.4	27.3	30.2	30.0
7	31.0	28.7	30.9	29.8	28.7	27.1	26.5	25.3	28.0	28.9
8	27.2	26.0	28.3	28.0	25.9	24.9	23.5	23.1	26.2	26.2
9	22.8	23.2	24.1	23.8	21.5	21.9	20.1	19.5	22.2	23.8
10	15.5	15.6	15.7	14.3	15.7	16.0	13.8	13.9	16.5	17.5

Sources: INEGI (National Income and Expenditure Household Survey) for the reported years

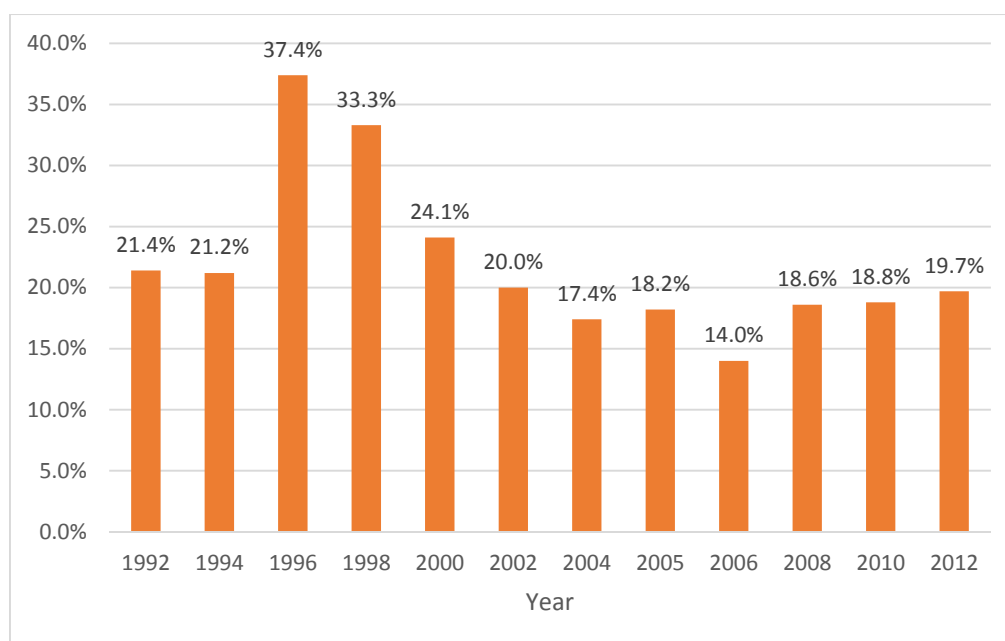
Leaving out the troubling increase in obesity in Mexico, the observed increase in food import dependency and self-sufficiency should not in itself be worrisome, as long as Mexicans have enough income to buy food in order to satisfy their basic needs, i.e. as long as the economy grows and provides jobs and sufficient income. Unfortunately, this has not been the case. According to Mexico’s National Council for the Evaluation of Social Development Policies (*Consejo Nacional*



*de Evaluación de la Política de Desarrollo Social*, or CONEVAL), extreme poverty increased in 2008 and has remained high during recent years. This comes after a period of more than 10 years of income poverty reduction as the Mexican economy recovered from the macro-crisis in 1995/1996. As shown in Figure 6, food poverty in 2008 (as well as income poverty in abilities and in assets) affected a share of Mexicans similar to the figure for 1992: 18.6% and 21.4% respectively, with food poverty at 19.7% in 2012. The number of people in extreme food poverty increased from 18.579 million in 1992 to 20.790 million in 2008 and to 23.089 million in 2012. The number of households in extreme poverty also increased during these years: from 3.04 million to 4.08 million and 4.917 million respectively (CONEVAL 2012).

During the period of reforms the incidence of poverty in rural areas (localities with up to 2 499 inhabitants) remained higher than urban poverty. For example, in 1992 there were 11.779 million rural people suffering food poverty and 6.801 million poor urban inhabitants, while in 2012 the figures were 13.630 million and 9.459 million respectively (CONEVAL 2012).

According to CONEVAL, one phenomenon explaining the recent increase in poverty is the poor growth performance of the economy, caused in part by the international economic crisis, which has meant low growth in job creation in the formal sector, and hence waged income stagnation. With respect to extreme food poverty, I add that its increase in recent years comes in part from the increase in and higher volatility of international food prices (there is evidence of staple foods price convergence between Mexico and the USA; Jaramillo *et al.* 2012).



**Figure 6: The incidence of food income poverty (%)**

It is important to note that rural food poverty decreased from 2008 to 2012, whereas extreme poverty in urban areas increased by -0.9 and by 2.2 respectively. While the drop in extreme rural poverty was not statistically significant, in urban poverty it was. This suggests that the rural population is relatively less vulnerable to food price shocks than the urban population.

## 5. Lessons from Mexico

After almost 30 years of market-oriented reforms and trade liberalisation, Mexico's economic and social performance has been disappointing (the exception is the attainment, since the end of the 1990s, of macroeconomic stability (Lustig 2010)). In addition to the poor growth performance and

lack of sustained poverty alleviation, the economy of Mexico continues to be highly unequal. For example, the income Gini coefficient in Mexico was 0.53 in 1992 and decreased to just 0.50 in 2008, and to 0.47 in 2010 (CONEVAL 2012).

Mexico is increasingly dependent on the economy of the USA and its economic cycles: the share of the USA in Mexico's total and agricultural trade has increased, up to more than 80% in staples and processed foods. In principle, food dependency may not be a threat to food security; however, the experience of low income growth and high inequality in Mexico is troubling, especially in the context of climate change and increasing international food prices and/or their volatility,

The Mexican government recognised this situation at the beginning of the last decade, but the agricultural and rural policy changes implemented to enhance food production and security have largely failed, as demonstrated by the data on the increasing extreme or food poverty incidence, coupled with the rise in food expenditure for all income groups. To the above should be added the inefficacy and inefficiency of public interventions in agriculture, since the increase in public spending in the new millennium has not translated into increased food production.

Three features of contemporary agricultural and rural policies in Mexico stand out: the high public budget directed at these two sectors, the unequal distribution of benefits, and the emphasis on the provision of private, rather than public, goods, including the lack of sufficient public investment in research, development and technology transfer to agriculture (R&D). Nevertheless, and notwithstanding the last two features, production on small farms survives.

According to FAO estimates, Mexico stands out as the Latin American country with the strongest agricultural orientation in public spending (this measure is based on the ratio of agricultural GDP to agricultural public expenditures and dividing it by the ratio of total GDP to total public expenditure (Scott 2006)). The high public expenditure on Mexican agriculture contrasts with the overall poor performance of the sector, explained in part by the multiplicity of agricultural programmes, and their inefficiency, inequity and bias in favour of private goods (Taylor *et al.* 2007; Berdegue *et al.* 2013).

Mexico's agricultural policies have been highly regressive. Even the Rural Development Programme of Alliance (Table 1), directed towards marginalised rural regions where poor and small farmers are located, is regressive. Inequity in government agricultural programmes has a negative effect on farmers not receiving subsidies, especially medium-sized and small producers (Scott 2010; and see Sumner and Balagtas' (2007) study of the effects of the ASERCA deficiency payment program *Ingreso Objetivo*).

Contemporary public spending in rural Mexico has an emphasis on the provision of private benefits and not of public goods. Taylor *et al.* (2007) estimate that, in 2005, around 30% of the total public budget for agriculture and the rural sector was channelled into providing private goods. In addition, productive public subsidies to agriculture benefit large-scale commercial farmers. This public policy bias potentially jeopardises the survival of small-scale farms producing staples and other foods.

The continuation of agricultural production on small farms during Mexico's economic liberalisation process, as well as small rural farmers' relatively high productivity and efficiency in producing basic crops (Taylor & Yúnez-Naude 2010) suggest a potential for small farms to increase their contribution to food production in Mexico. For this to happen, the Mexican state needs to overcome major challenges in reforming agricultural and rural policies so as to include small farms, and to adopt a long-run view by investing in the provision of public goods and encouraging decentralisation in public policies for agriculture and rural development.

An example of the failure to provide public goods is the modest effect of *Fundaciones Produce* (part of Alliance for the Countryside), a public scheme to improve, amongst others, the agricultural productivity of small rain-fed farmers through the transfer of modern technologies. The data in Table 14 illustrate this: it shows the meagre impacts of *Fundaciones Produce* on yields in basic staples produced under rain-fed conditions (a summary of the findings of Eduardo Trigo's evaluation of R&D policies in the agriculture of Mexico can be found in Taylor *et al.* 2007).

**Table 14: Yields of major staples in rain-fed plots, 1983 to 2008**

	1983-1993	1994-2000	2001-2008
Beans	0.5	0.5	0.6
Maize	1.7	1.8	2.1
Wheat	1.6	1.7	2.0
Barley	1.5	1.6	2.0
Sorghum	2.6	2.4	2.7

**Sources:** 1980-2005: website of the Mexico Ministry of Agriculture (SIACON); 2006 onwards: SIAP

Another failure is PESA, since the effects of this strategy on food security have been unsatisfactory as food poverty and insecurity in Mexico have increased recently. This means that PESA has not reduced rural households' vulnerability to shocks such as the rise in international food prices.

A current effort to promote maize production in Mexico is the strategy called MasAgro, conducted by CIMMYT with the participation of the Ministry of Agriculture.<sup>10</sup> MasAgro began in 2010 with the purpose of enhancing food security for maize and wheat through R&D, capacity building and technology transfer. This effort endeavours to permit small and medium-size ("traditional" and/or rain-fed) farmers to obtain high yields in these two crops, to increase their income and to contribute to mitigating the effects of climate change in Mexico (MasAgro 2012).

There is not yet an external evaluation of the effects of MasAgro; however, according to the former Secretary of Agriculture, the impact of the strategy has been negligible in terms of the concrete application of MasAgro: out of 30 states (Mexico's equivalent to provinces), only 10 have signed agreements with MasAgro (Informador.com.mx 2013). This low coverage of MasAgro indicates the challenges faced to enhance a sustainable increase in food production by small farmers.

However, the present federal government's National Development Plan (NDP), and in particular its strategy called *Cruzada Nacional Contra el Hambre* (CNCH, Crusade against Hunger), is an opportunity to promote, together with MasAgro, food security in Mexico, amongst other goals.

Similar to MasAgro, one of the basic objectives of the CNCH is to increase the food production by and incomes of small farmers (and rural households) as part of the goal of the NDP to democratise productivity. In particular, the Mexican government must link social policies to productive policies in the rural economy within a framework of coordination between the relevant ministries and between the three levels of government (federal, state and municipal/county). These actions must include the participation of small producers and/or rural food-producing households in the design and implementation of specific policies. The rural households must be included in order to articulate policies with the specific requirements and demands of these actors (details in Berdegue *et al.* 2013). This approach, i.e. from top to bottom, will resolve, at least partially, the question of which producers have a productive potential.

<sup>10</sup> MasAgro is the Spanish acronym of *Modernización Sustentable de la Agricultura Tradicional* (Sustainable Modernisation of Traditional Agriculture).

Food security policies must emphasise the provision of public goods, and must not, as before, rely almost exclusively on income transfers to individuals. In particular, the investment in infrastructure and communications and R&D must be emphasised, as well as the promotion of rural organisations at the production, storage, marketing and financial levels.<sup>11</sup> All of the above must be undertaken with a territorial perspective in order to connect the economy of rural localities with nearby urban centres (see RIMISP (2013) publications on “functional territories”).

There is another lesson that can be learned from the experience of Mexico. The evaluation of public social and agricultural policies carried out by CONEVAL is now a major reference for understanding the evolution of poverty in Mexico. It has been possible to measure this impact thanks to the data of ENIGH and other official surveys. CONEVAL, together with the Ministry of Finance, also is responsible for seeking external and independent experts to evaluate the design and results of social and agricultural government programmes. Unfortunately, rigorous empirical impact analyses such as those based on quasi-experimental approaches are scarce. For agricultural programmes, the lack of impact evaluation is mainly due to the insufficient official data on their potential and actual beneficiaries. This requirement will be fulfilled by a survey representative of rural producers that CONEVAL plans to implement before the end of 2013.<sup>12</sup>

## 6. Conclusions

In Mexico, government intervention in agriculture changed radically at the beginning of the 1990s in the process of economic reforms and free trade negotiations under NAFTA: from direct interventions through a State Food Enterprise, price supports and food import controls to “transition” policies and freer agricultural trade. The Ministry for Social Development was created in conjunction with the reforms, and with it came a tacit separation between social and productive policies in the rural sector. With the exception of PROCAMPO – the direct income transfers to farmers producing food staples – agricultural subsidies focused on commercial farmers, mostly located in the northern arid regions of the country.

Agricultural policies during the 1990s were intended to be transitory to help farmers to prepare for the competition from their American counterparts (the process of full agricultural liberalisation under NAFTA ended in December 2007). However, these policies remain up to the present (i.e. the first year of Peña Nieto as President of Mexico and Congress). However, there are reasons to expect that some policy changes will be adopted, at least in relation to the current administration’s Crusade against Poverty.

The apparent perpetuation of the agricultural policies of the past is associated with the maintenance and/or creation of powerful interest groups that are beneficiaries of government subsidies; this is other lesson the Mexican experience can offer.

NAFTA is not necessarily to blame for the present condition of the agricultural sector and the continuation of poverty in this sector. I propose that the unsatisfactory performance of agriculture is a consequence of the extreme view adopted by the Mexican state, namely that recourse to the markets is the best policy option to attain economic development. For agriculture, this view was present in the expectation that freer markets and trade would ensure a more efficient use of resources, as well as food security. In industry, this viewpoint explains the disappearance of an industrial policy, and hence it is not surprising that there is no policy regarding dietary phenomena

---

<sup>11</sup> For example, access to formal credit in agriculture and rural localities is practically absent.

<sup>12</sup> In addition to quasi-experimental evaluations of policy impacts (e.g. those based on the Propensity Score Matching approach), new methodologies are now being applied, based on micro-economy-wide modelling. See Filipisky and Taylor (2011) for evaluations of income transfer programmes in Malawi and Ghana.

in Mexico. Instead, we have witnessed a rise in the consumption of non-nutritional foods produced in Mexico and abroad.

In addition, there was no serious state effort to invest in and promote R&D, and in particular to promote, adapt and transfer new technologies to small and medium-sized farmers, whereas large farmers in the North had the option to adapt new technologies developed abroad and, more specifically, in the USA.

As discussed in this paper, there are signs that the current administration is aware of the challenges Mexico faces to create effective and efficient agricultural and rural policies to attain food security. Diagnoses of public policy failures are available, as well as concrete proposals “to reform the reforms”; what is required is the political will of powerful groups to put them into practice. I hope that the current administration will implement the required policy changes, and that, with this, Mexico could offer positive lessons to other countries in earlier stages of development.

### Acknowledgements

I wish to acknowledge the financial support of Canada’s International Development Research Centre (IDRC) through the Latin American Centre for Rural Development (RIMISP), and of the Flora and William Hewlett Foundation, as well as the support in data gathering I received from Arturo I Cisneros and the editorial revision by Peri Fletcher.

### References

- Berdegue J, 2013. Propuesta de un Programa Articulador para Reducir la Pobreza y Aumentar la Producción de Alimentos y el Ingreso de los Campesinos y Pequeños Productores Agrícolas. Mexico.
- CONEVAL, 2012. Available at <http://www.coneval.gob.mx/> (Accessed August 2013).
- Dyer G, Taylor JE & Boucher S, 2006. Subsistence response to market shocks. *American Journal of Agricultural Economics* 88(2): 279–91.
- Dyer G, Taylor JE & Yúnez-Naude A, 2005. Disaggregated rural economy-wide models for policy analysis. *World Development* 33(10): 1671–88.
- Filipsky M & Taylor JE, 2011. A simulation impact evaluation of rural income transfers in Malawi and Ghana. *Journal of Development Effectiveness* 4(1): 109–29.
- Garfias EkF, 2010. Derechos de propiedad y cambio institucional en el campo mexicano. Thesis, Instituto Tecnológico Autónomo de Mexico (ITAM).
- GATS (Global Agricultural Trade System Online), 2013. USDA Foreign Agricultural Service. Available at <http://www.fas.usda.gov/gats/ExpressQuery1.aspx> (Accessed August 2013).
- Informador.com.mx, 2013. Available at <http://www.informador.com.mx/5197/sector-agropecuario> (Accessed August 2013).
- Jaramillo JL, Yúnez-Naude A & Serrano V, 2012. Spatial North American agri-food market integration: The case of maize, sorghum and wheat. Paper presented at the 28th International Conference of Agricultural Economists (ICAE), 18–24 August, Foz do Iguacu, Brazil.
- Lustig N, 2012. Macroeconomía. Mexico City: El Colegio de Mexico. Also at <http://colmex.mx>
- MasAgro, 2012. Available at <http://masagro.mx/index.php/en/> (Accessed August 2013).
- OECD, 2013. Available at <http://www.oecd.org/> (Accessed August 2013).
- RIMISP, 2013. Available at <http://www.rimisp.org/publicaciones-documentos/> (Accessed August 2013).
- Robles H, 2010. Una visión de largo plazo: comparativo resultados del VII Y VIII Censo Agrícola Ganadero 1991-2007. In Fox J & Haight L (eds.), *Subsidios para la desigualdad: las políticas públicas del maíz en México a partir del libre comercio* (pp. 185-193). Washington DC: Woodrow Wilson International Center for Scholars.

- Scott J, 2006. Pobreza rural y políticas públicas. Paper presented at the Seminar “Desarrollo Rural y el Sector Agroalimentario”, March, Mexico City, Mexico.
- Scott J, 2010. Subsidios Agrícolas en México: ¿quién gana, y cuánto? In Fox J & Haight L (eds.), *Subsidios para la desigualdad. Las políticas públicas del maíz en México a partir del libre comercio* (pp. 73-127). Washington DC: Woodrow Wilson International Center for Scholars & Centro de Investigación y Docencia Económicas (CIDE).
- Singh I, Squire L & Strauss J (eds.), 1986. *Agricultural household models – extensions, applications and policy*. Baltimore: The Johns Hopkins University Press.
- Sumner DA & Balagtas JV, 2007. Economic analysis of the Ingreso Objetivo program in Mexico. Final Report for the Project *Políticas y gasto público federal en el sector rural en Mexico* (pp. 1-55). Washington DC: Inter-American Development Bank (IDB).
- Taylor JE, Yúnez-Naude A & González, M. 2007. Final Executive Report, *Estudios sobre Políticas Públicas para el Sector Rural en México*. DB and Mexico Ministry of Finance.
- Taylor JE & Yúnez-Naude A, 2010. Assessing the efficiency of Mexican smallholders and drivers of structural change in Mexican agriculture in recent decades. Report to the FAO.
- Yúnez-Naude A, 2003. The Dismantling of CONASUPO, a Mexican state trader in agriculture. *The World Economy*, 26(1K): 97–122.
- Yúnez-Naude A, 2010. Las políticas públicas dirigidas al sector rural: el carácter de las reformas para el cambio estructural. In Yúnez A (ed.), *Economía rural* (pp. 23-62). Mexico City: El Colegio de Mexico. Also at <http://colmex.mx>
- Yúnez-Naude A & Aguilar P, 2012. Análisis sectorial para una economía verde (Mx-GESS). Final report, Project Mx-GESS, IDB, National Institute of Ecology and United Nations Program for the Environment.