

FOOD SELF DEPENDENCY IN MEXICO: A CHALLENGE IN THE NATIONAL FOOD SECURITY AND PUBLIC POLICIES OF THE COUNTRY

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Abstract: In Mexico, agriculture has become a problem of national security, where the Mexican agrarian sector has productive options and policy solutions to improve its functioning and development. The main objective of this study is to offer a current contribution to the debate between sustainability and national food security through interpretive hermeneutics and socio-statistical analysis. It analyzes how positions have been adopted towards a sustainable opening in the 21st century. Because of the importance it presents at an economic, political and social level. The results show that the failure of food policy is reflected in the tariff balance since the imports of basic grains, oilseeds and cereals required in the country are increasing. In conclusion, the research shows that agriculture is a national security activity, not only because of the need to supply food but also because it represents an extensive activity both in Mexico and abroad.

Keywords: Agriculture, food security, public policy.

INTRODUCTION

The concepts of food security and sustainability (SA) are under ongoing discussion and analysis given their importance. One of the main concepts of SA is the right for food, as it has been intended to be achieved through social revolutions throughout time, without results concerning social inequality and justice, resulting in one of the biggest challenges for humankind (Moreno and Cantú 2015). Hobbes and other researchers on scientific policy have stated that total security comes along with a lack of warranties and freedom. The truth is that strategies that have been taken to eliminate hunger or even diminish it haven't been able to accomplish Millennium goals set out in the 2030 Agenda for Sustainable Development of the UN and FAO on food security (FAO et al., 2017).

It is very important to incorporate in the world public policies discussions the pertinent tools that allow governments to make decisions concerning food security and sustainability (SAS), and to make changes in order to match alimentary needs in each country. For the punctual analysis of Mexico, strategic plans concerning alimentary policy have to respond to the transitions and transformations of international food consumption that take place in the current economic model (Moreno-Calles et al., 2011; Torres, 2014).

There have been geopolitical changes during the last century and the beginning of the current one that have led to social impairments resulting in one fifth of the world population living in extreme poverty (PMA et al., 2002) and hunger, thus questioning the quality of life experienced by the population of the whole world.

Otero has established discussion around the fact that food availability around the world mainly centered on food security hasn't been achieved given the lack of access to food, in addition to inequality and low production rate (Otero, 2013). In order to achieve food security, an entire population, a household or even a single person has to have stability certainty, availability and access to adequate nutrition, therefore, it is out most important to have a local, national and international participation in the free commerce of local produce and industrialized production (Vizcarra, 2008), as well as local artisan production to avoid the risk of food restriction if a sudden crisis occurs (economic or climate change crisis, for example) or even a cyclic event (like seasonal food insecurity) (IICA, 2012).

Mexico has a population of 119 938 473 million people (INEGI, 2015). Based on the estimations of population growth made by international organisms such as FAO, as well as national institutions such as the ministry

of agriculture (SADER), food production would have to increase 100% for year 2050. The country has a territory of 1 964 375 km², of which agriculture is only developed in 111 273 (INEGI, 2017), 88 704 km² with the periodic agricultural production (SAGARPA, 2014). Therefore, it is important for the government to have a strategic planning of national food policy that allows production balance that help feed the population in a sustainable way (Montoya, 2011). This article aims to show that food sustainability has become a national security issue and that public policies on the subject are the first step to fighting hunger.

BEGINNINGS OF INTERNATIONAL FOOD SECURITY

The food security concept was born on the 70's based on the need of production and distribution of food worldwide. In the 80's the idea of physical and economic access was incorporated. During the 90's the concepts of safety and cultural consumption were added to the definition (PESA Centroamérica, 2011). Before the use of the current definition, it is stated in the Human Rights Universal Declaration (1948) that "every person has the right of a way of living that assures to him and his family food, health and wellbeing..." (Art. 25).

Therefore, food security on each country depends on the capability to give food to its population and according to the definition given on the World Food Summit (2002), "there is food security when all the people have physical and economic access to enough safe and nutritious food to meet their alimentary needs and preferences in order to have an active and healthy life". (PMA et al., 2002). However, the lack of food security is based on the "transformation on the economic model" (Torres, 2014) that left behind the production and distribution of

basic grains mainly to the local population and to a lower extent to the international market.

BASIC ELEMENTS OF FOOD SECURITY AND SUSTAINABILITY

The basic theoretical elements of the analysis of food security, as the one of sustainability, are introduced during the first decades of the 21st Century. The concepts of food security and agricultural sustainability are interchained given the urge to generate tools that allow the analysis of solutions that lead to conservation of the human species and planet Earth, stopping the deterioration of ecosystems and securing the universal right to live, as well as providing the next generations with resources to live and feed.

The political model of neoliberalism created and introduced during the last decades of the 20th century, leads food policy to search solutions to the adversities of today's world. Food sustainability is a survival strategy to present and future challenges. In the definition of food security, agricultural sustainability is defined as "an ecologically healthy system, economically viable, socially fair, just and with equity, and sensitive to culture" (Hoeflich Enkerlin, 1997; Marielle, 1995). In practice, as the author has stated, there is not a complete match between the food security concept and capitalist model.

One of the international proposals for food security and sustainability was included in the World Food Summit in 1996 in which the First Development Goal of the Millennium was "to reduce by 50% the population who suffers from hunger between 1990 and 2015". In the UN General Assembly in 1997 the terminology of "sustainable food security (and adequate housing)" was recognized and included in the context in which the end of poverty and hunger is the biggest challenge

for humanity. (PMA et al., 2002; Ruane and Sonnino, 2010; Moreno and Cantú, 2005).

However, geopolitical changes have established an environment of world political, social and ecological crisis that has led to chronic hunger and lack of food, seriously questioning the quality of life of most of the world's population (PMA, et al., 2002).

Even in the 21st century humanity lives with unthinkable levels of inequality and polarization. Social inequality generated by the wars and capitalism has led to a search for initiatives that help stop the increasing poverty and hunger tormenting humanity without significant results.

One of the transformations that are taking place in the 21st century is climate change. Many strategies have tried to achieve a harmonious relation between humans and the nature surrounding us. Thus, the importance of natural resources and their conservation as well as innovation in agricultural practices that help match agricultural products with human nutrition (Steps, 2012; Ruane and Sonnino, 2010). The first Alimentary security principle states that “promoting agriculture would lead” to alimentary security. However, data shows that agriculture only represents 30% of GP even when it is 50% employment in developing countries in which three of every four persons live in poverty (Ruane and Sonnino, 2010).

International Monetary Fund (IMF), and World Bank (WB) as well as the Food and Agriculture Organization of the United Nations (FAO) have warned of “another food crisis” yet to come (Ruane and Sonnino, 2010). FAO and UN World Food Program (PMA) have declared that people living with hunger in developing countries has risen from 827 million in 1990 to 906 million in 2010, while 795 million people had malnutrition in year 2015 (PMA et al., 2002; FAO et al., 2015). Today, hundreds of millions suffer

from deficient nutrition or even die of hunger. Future needs in relation to food depend for instance on the world's population volume (Moreno and Cantú, 2005).

Food security in our time is linked to free trade policies based on the food import at the lowest price possible which, as said by some authors, “have been determinant in the lack of capacity of developing countries to provide food security for their own citizens” (Torres, 2014).

The complexity of the problem regarding food security faced by humanity today is overwhelming and requires including a balanced study of human behavior and how people could satisfy present needs without compromising the ability to meet those of future generations (Méndez, 2012; Hoeflich, 1997).

METHODOLOGY

The interpretative hermeneutics (art of text interpretation) was used. This approach is more than making relationships between words and texts and requires the ability to separate the subject from the facts related to it. The interpretation process is then the fundament of the analysis (Cárcamo, 2005).

Construction of the dataset included selection of information based on texts found in Web of Science (<http://apps.webofknowledge.com.access.biblioteca.cinvestav.mx>). Excel was then used to make comparatives between texts retrieved and analyze them in terms of background of food policy, biotechnology analysis, sustainability, and economic and social analysis in Mexico. This research has been based on the backgrounds of the relationship between sociology and technology applied to the national alimentary system and its evolution from the Auto-sufficiency Model during the presidential term of Lázaro Cárdenas del Río up to the Neo-agricultural Model in our days.

Statistical data for import/export analysis was obtained from FAO's databases (<http://www.fao.org/faostat/en/#data/TI>), and the online information system of the Ministry of Economics (SIAV de <http://www.economia-snci.gob.mx/>) as follows: a) Import/export data of basic grains, cereals and legumes included on chapters 10 and 12 of SIAV and b) Specific queries for corn in chapter 10.5 and beans in chapter 12.1. The dataset for grain production was obtained from SIAP (In Spanish: Servicio de Información Agroalimentaria y Pesca), (<http://www.siap.gob.mx/cierre-de-la-produccion-agricola-por-cultivo/>) by selecting information concerning beans and corn.

RESULTS AND DISCUSSION

MEXICAN ALIMENTARY POLICY IN THE 20TH CENTURY

In the post war period between 1958-1970, the agrarian reformation and land redistribution that began in the early 20th century continued due to social pressure. During year 1967 crisis develops in the Mexican countryside specially on the main crops: corn, coffee and sugar. The culture of vegetables and floriculture rises with an incipient technologic revolution (Rubio, 2004) During the 80's decade the agrarian policy model made 180 degrees turn from alimentary sovereignty to a neo agricultural model (Figure 1) based on orchard fruit production, despite the constant warnings made by the experts concerning malnutrition in the population and alimentary deficit that came along with the tax regulation of grains and cereals on Mexican countryside. As a consequence of a heavy drought in 1979, grain and cereal production was insufficient, and imports of basic grains rocketed deteriorating the trade balance and accentuating crisis and money devaluation (Ávila Curiel et. al., 2011).

On the last decade of the 20th century, a social, economic and politic crisis prevailed, and it was felt on food prices. While sustainable food production decreased, the North America Free Trade Treaty (NAFTA) began, ending with land distribution and agrarian reformation. Article 27 of the Constitution is amended, leading to an unavoidable downfall for Mexican countryside (Gastelum Bajo, 2006; Méndez, 2012).

Although in the last decade of the 20th century the government implemented subvention to products such as corn and beans, production continued decreasing, minimum prices were eliminated (Figure 1), state companies and organisms were sold to the private sector, a National Commission for the use of water (CONAGUA) was created, and two programs were implemented, one for the countryside modernization Comprehensive Field Modernization Program (in Spanish Programa Integral de Modernización del Campo), and the other one for economic support of the producers Direct Support Program to the Field - Procampo (In Spanish: Programa de Apoyos Directos al Campo-Procampo). Nevertheless, agricultural production still had a low contribution to national GP (Méndez, 2012; SIAVI, 2017).

CONSEQUENCES OF MEXICAN FOOD POLICY ON THE 21ST CENTURY

The failure of Mexican food policy is clearly reflected on the trade balance as imports of basic grains, legumes and cereals are rising in order to satisfy the country's needs, while many farmers and producers are in poverty (or even extreme poverty). As seen in Figure 2, Mexico has been dependent in terms of food supply for over 10 years.

On year 2012, Mexico was the second country that registered a rise of 8.7% on food consumption according to ODCE (Torres,

2014). In Mexico agricultural exports account for 1097.4 million dollars, while imports of consumer goods add 3 884.3 million dollars and 3, 712, 775, 196 million dollars are used for the purchase of grains and legumes considered basic food (BC, 2016).

During the year 2016 seed and legume imports registered 2,994,008,101 million dollars for a volume of 5,914,755,591 tons, while exports of the same items totaled 138,366,188 million dollars for a volume of 98,609,718 tons. With respect to the first bimester of the year, imports of grains and legumes registered 430, 168,250 dollars, and exports on the same items accounted for 26, 532,074 dollars. The USA is the most important trade partner of the country. See Figure 3.

Agricultural regulation in the last century led to profound breaches of food insecurity. In this century agricultural policy is not even visible as plans and programs implemented in neoliberalism have not been sufficient to develop the agricultural sector (Méndez, 2012). During the 1st decade of the 21st century the government created programs and ministries to downsize social and economic inequalities that grew under NAFTA. This is the case of SAGARPA (The acronym in Spanish: Secretaría de Agricultura, Ganadería y Desarrollo Rural, Pesca y Alimentación, which is the Ministry of agriculture, cattle raising, fishing and rural development) and the program for agricultural and fishing development. Méndez, 2012 and Ávila, *et al.*, 2011 have discussed how these programs intended to solve problems in production and distribution of food at a national level that have led to the increase of malnutrition and obesity in the last two decades of last century and the first decade of the present one. Food policy on the second half of the 20th century continues until our days and fails to provide food security to 69.8% of Mexican

households (Mundo, 2013).

Food security or food insecurity can be studied on a household level. This measure has been used as an indicator of poverty and thus provides insight on the effectiveness of public policy interventions of each government.

Although the last survey National Health and Nutrition Survey (the name in Spanish is: Encuesta Nacional de Salud y Nutrición) made by the Mexican government via INEGI, Ensaut (2020) there has been a reduction on the Food insecurity indicator, there is still a big portion (almost a quarter of Mexican population) that experiments Food insecurity especially in rural areas.

FOOD SECURITY AND SUSTAINABILITY: AGRICULTURAL PRODUCTION IN MEXICO ON THE 21ST CENTURY

Mexico has a territory of 1 964 375 km² from which 111 273 km² are dedicated to agriculture. 81.5% are being used for crops and 80% use open pit cultivation with little or non-existent technology. This situation generates soil wear off, low productivity and low rentability (SAGARPA, 2014; INEGI, 2015). According to Coneval, in year 2010 46.2% of Mexican population lived in poverty or extreme poverty conditions (Lobato, 2013).

Grains, cereals and legumes are the main elements considered for the measurement of food security worldwide. Corn and beans are the main agricultural products in the basic diet at a national level since the first basic food study in Mexico on year 1962 (SIAVI, 2017; Ávila *et al.* 2011). In year 2016 Mexico registered a production of 1 million 094 thousand tons of beans with an annual price variation of 20.4% between the first 15 days of years 2016 and 2017 (SIAP, 2017), as can be seen in Figure 4.

Corn production accounts for 24,410 thousand tons in 2008, with an increase rate

of 2.58 shown that year (Miguel *et al.*, 20011). Reported imports of both corn and beans are rising, while production of both products is decreasing. In the case of corn imports in the last year were 2, 689, 944, 584 million dollars, while bean imports were 1,620, 223, 725 million dollars.

Participation in the country's GP continues to decrease and implemented policies have given neither productivity nor rentability to the agricultural sector. The first decade of the century goals concerning reduction of 20% of malnutrition and food poverty hasn't been achieved yet. (Ávila *et al.*, 2011).

CONCLUSIONS

Agriculture has big trouble in achieving food security in Mexico due to the neo liberal economic strategies put into practice on the 20th century. The existence of a neo liberal agricultural model has increased the social and economic breach in the whole country as it has led to a crisis of great dimensions that has prevailed for more than a decade. The lack of public policy that tends for the sufficient and pertinent food provision for everyone has exposed two big poles of food insecurity: the first one, that already existed, malnutrition (specially on infants); and the second one, obesity in both urban and rural zones.

Measures that must be implemented have to deal with the nourishment of the soil left useless by the import substitution model, the Green Revolution, the acceptance of food production industries and an imminent change in agricultural policy.

Increasing demand of basic grains at a national level combined with their low production produces a deficit on the commercial balance that is higher than the reported on an international level and reported by FAO. In the last 10 years, commercial balance of basic grains shows incapability to supply the country with basic grains and

cereals, a situation that was not present in the first half of the 20th century.

The lack of regulation, economic support, and efficient channels for gathering and distribution of basic grains leads to dependence on imports on cereals, basic grains and legumes to meet the population needs on terms of the consumption of these products. Moreover, the availability of the products doesn't mean they will reach the population that needs them, and whose needs have not been satisfied. In addition, the distribution channels for basic grains (either produced or imported) are inefficient. The problem in our country is not the Access of farming land or workforce (farmers and other workers). Policies for price regulation, distribution, availability and food access are needed to achieve stability for the nation. This will not be possible if corruption within distribution channels is detected and removed.

In order to prevent a crisis, FAO suggests applying a series of tools that constitute a technological response and local and regional civil participation that responds to demand of food production productivity and help acquire food security. It is important to create links between universities, landowners, land workers, and farmers in search of the optimization of food production and procuring rentability for producers to generate a sustainable environment.

How could scientific groups help with food security? By knowledge and technology transfer, using training and follow up on short, medium and long term, and by using the tools for achieving food security promoted by FAO. The strategy for instrumentation of those policies must be micro diffusion for their introduction in communities and in the long term this would lead to macro diffusion of policies.

Finally, the research work has shown that food security is in peril because of the strong

economic interests that are generated on the “transformation of an economic model” (Torres, 2014). Despite this, there are few research works that show the dependency on a national level and the impact this has on food security. It is very important to analyze if the food produced is enough to satisfy the needs of the population in developing countries and relate this question to population growth. For the case of Mexico, it would be reasonable to ask ourselves if the country is becoming food dependent faster than we expected. For the authors of

this paper the answer is that unfortunately we are. We hope this analysis helps decision makers in our country clear their view on the subject and act consequently.

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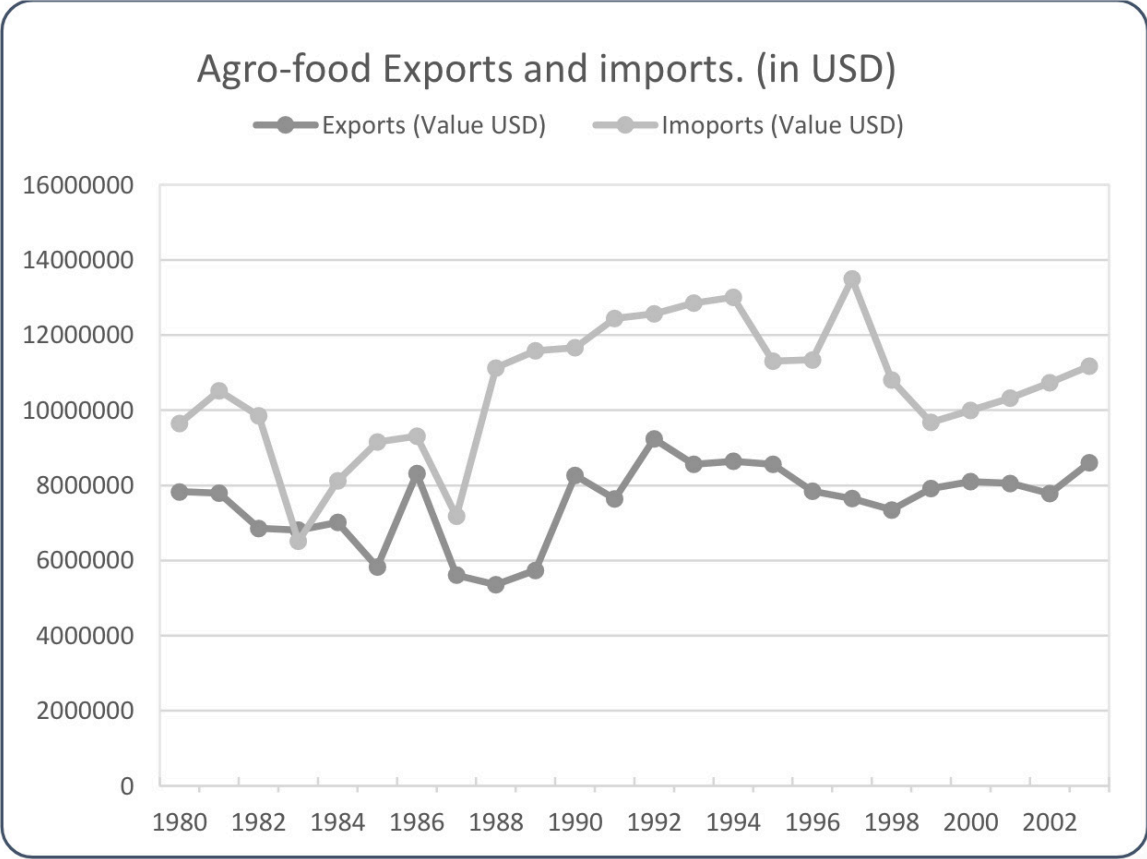


Figure 1. Agro food Exports and imports. Self-construction using data from <http://www.fao.org/faostat/en/#data/TI>

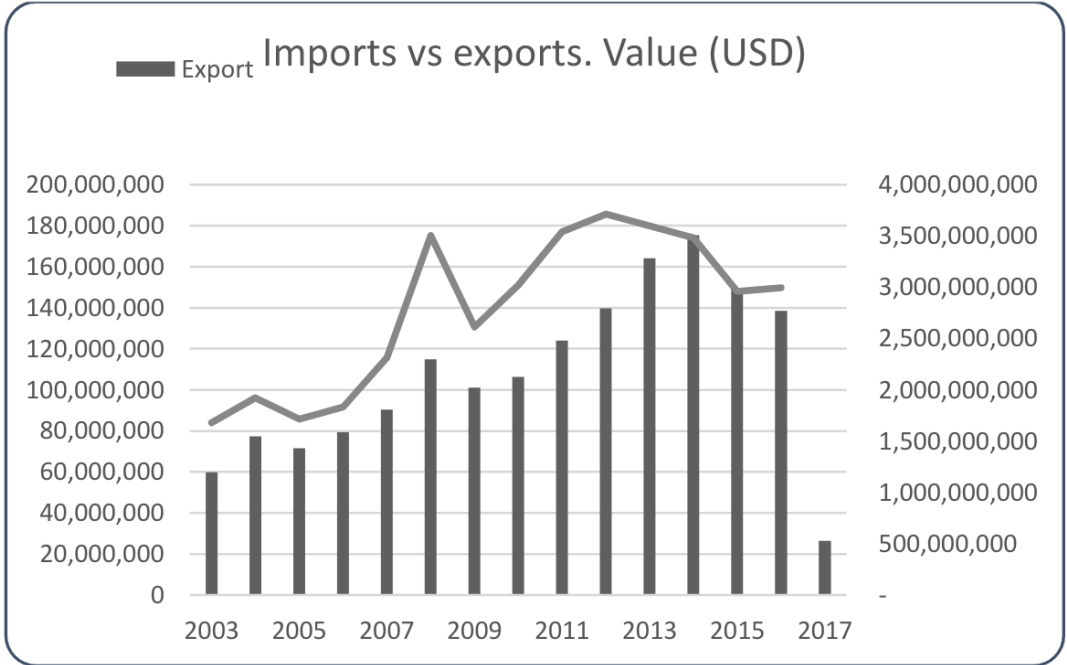


Figure 2. Food Exports and imports (Value) Self-construction using data from <http://www.fao.org/faostat/en/#data/TI>

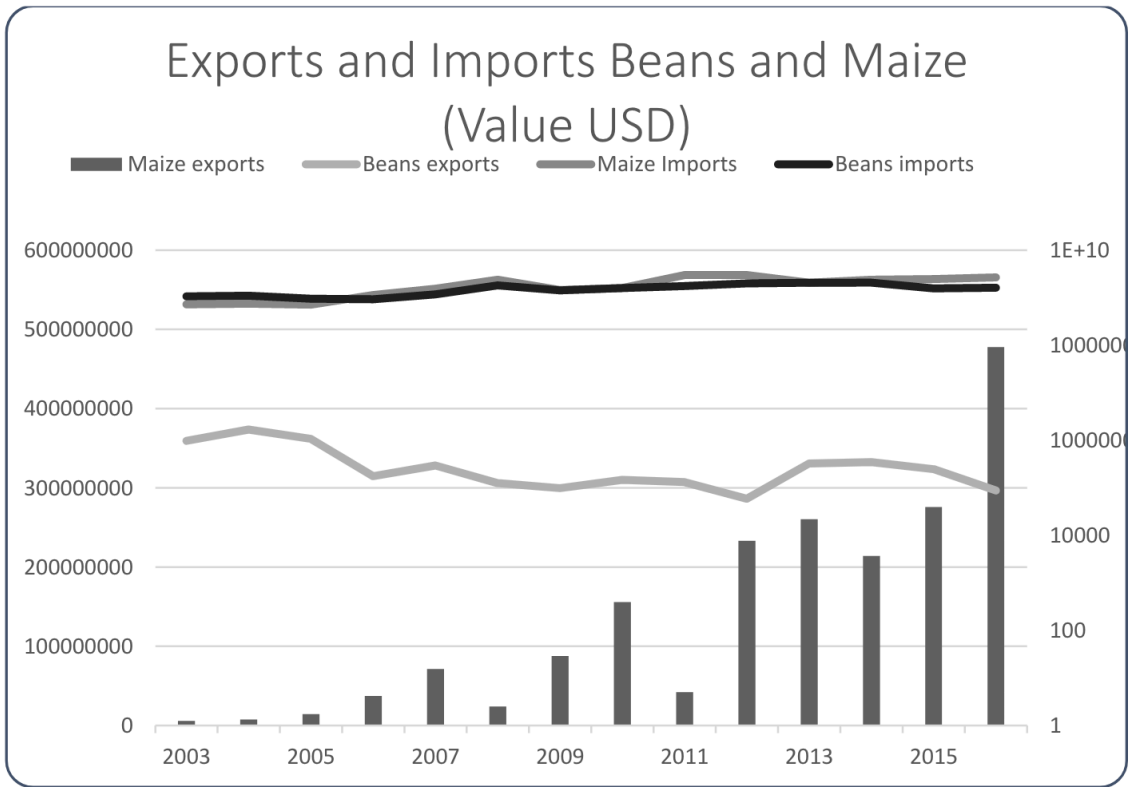


Figure 3. Beans and Maize imports and exports. Self-Construction using data from <http://www.economia-snci.gob.mx/>

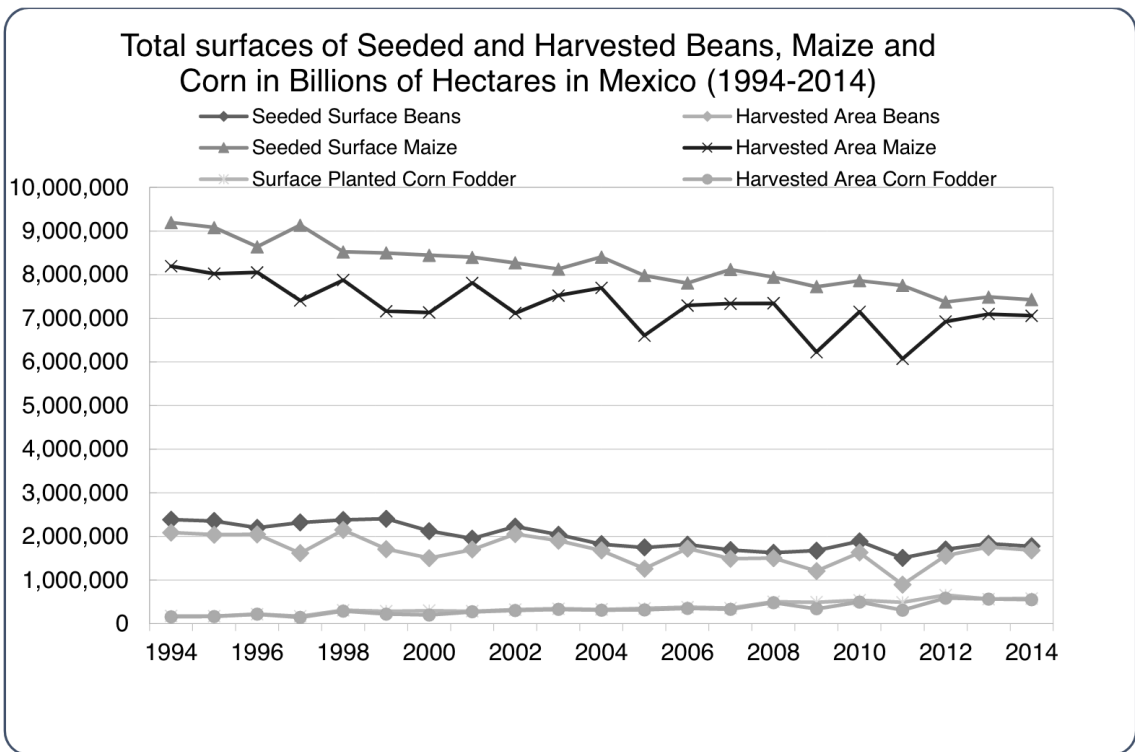


Figure 4. Seeded and harvested area for Beans, Maize and Corn fodder comparison. Self-construction using data from <http://www.siap.gob.mx/cierre-de-la-produccion-agricola-por-cultivo/>