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Why the *World's Food Basket* Became the Largest Grains' Importer Country? "Comparative Statement on Main Crops' Self-Sufficiency in Egypt and in China"

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Abstract

How a country as Egypt which is formerly known as the world's food basket and the gift of the Nile River became the largest grains' importer country of wheat? Why agricultural field in Egypt could not produce enough food for its people? And how does China succeeded to depend on itself to be able to feed its huge population? The current study used 4 crops (wheat, maize, rice and soybean), with three indexes (production, import, and domestic supply quantity) chosen to measure self-sufficiency (Ss). The study found out that, Egypt has a negative self-sufficiency for wheat, maize and soybean. Agricultural policies are the key of China's successful development and at the same time are the main factors which affected agriculture in Egypt and make it fail to produce enough food. This study highly recommends policy makers in Egypt to make an improvement on agricultural policies for the purpose of promoting the agricultural self-sufficiency by supporting farmers' to produce enough food.

Keywords: Egypt, China, self-sufficiency, wheat, maize, soybean, production, domestic supply

1. Introduction

Egypt (FAO. 2016) became the largest importer country of cereals (FAO, 216a) and its agriculture can't produce enough food for its people during last 60 years. The study of this very important problem will be helpful for researchers to understand why a country was known for many years as the world's food basket became the largest importer country of wheat. Self-sufficiency in grains is an important aim for many countries around World, as agriculture is a key sector of Egyptian economy as well as the rest of World countries (IFAD, 2005). Because of the importance of agricultural policies, all governments face the challenges for adopting an appropriate policy to produce enough food for its people (Abedullah & Ali, 2001). Similar situation happened in Malaysia (Alias et al., 2011) and in Japan (Anderson & Tyers, 1992) to adopt policy for production of enough rice and be rice sufficient countries. In Vietnam case, it was appeared that food production policy must incorporate soil conservation and improvement and population control (Bach & Khalid, 1992). Self-sufficiency in food grains has been a publicized goal of government policy in many developing countries (Barker & Yujiro, 1976). Some crops same as maize which has become a major food staple; it needed a special policy to increase its production in East and Southern Africa (Blackie, 1990). Some countries as Ghana and most of West African countries wish to become self-sufficient in rice (Brempong & Flinn, 1990). Senegalese government is investing heavily in the national rice sector (Diagne et al., 2013). Many researchers search on the logic of sufficiency to understand what to do in this topic and trying to understand these words of self-sufficiency (Costanza, 2006). Self-sufficiency is ecology of work and it is a welfare reform (Daugherty & Barber, 2001). There are a very strong relationship between cultivated land and self-sufficiency (Yang & Xiubin, 2000), As well as food prices and climate change (Wang, 2010), Food in China (Darby, 1992) can give a clear meaning of logic of sufficiency (Costanza, 2006) and how local can we go with self-sufficiency (Pardhan et al., 2014). In Arabic countries there

are possibilities for self-sufficiency (El-Sherbini & Sinha, 1978), such as Egypt has a good situation to be grain sufficient country as China succeeded to do that with its natural hazards (Simelton, 2011). Even Egypt has achieved a high degree of food security with lessened reliance on domestic production and has become one of the largest recipients of cereal food aid (Anne, 1983). In 1960 Egypt was self-sufficient in almost all necessary food produce (Helen, 1990). Therefore, this study aims to analyse impact of various factors for sufficient wheat production to meet domestic demand.

2. Materials and Methods

2.1 Farmers Investigation About

1) Agricultural policies, about their role, whether they effected or helped agriculture in Egypt last 39 years.

2) Cereals and why Egypt is the largest importer country of wheat? Cereals production gap and if farmers think Egypt can depend on its own agriculture to feed its people and how Egypt can make that?

3) Government support for different growth stages for major crops and for which growth stage farmers get some support from government in Egypt.

4) Future and challenges in agriculture field and what farmers expect from the new government in Egypt.

5) Main problems faced by farmers in Egypt and what government should do to fix them?

2.2 Data Sources

FAO, USIDA, Ministry of Agriculture (MOA) in Egypt and China, scientific journals summarized to figures such as: Production, import and export, stocks variations and domestic supply.

2.3 Objectives of the Study

The main objectives of this study are:

1) To answer the question of why Egypt is the largest importer country of wheat?

2) To execute a survey on self-sufficiency in Egypt and in China.

3) To understand the effect of support policy on self-sufficiency.

4) To design possible agricultural policies to change Egypt.

5) To suggest a balance between necessary and optional crops in Egypt.

6) To suggest recommendations to policymakers in Egypt.

7) To build a base for sharing more experiences between Egypt and China.

2.4 Hypothesis Tested

To study/demonstrate how it would be possible to enhance the self-sufficiency in Egypt by successful implementation of the agricultural development strategies/policies of People's Republic of China.

3. Results

3.1 Introduction

To improve the productivity of agriculture, Countries should begin to focus more effort on addressing long-term issues related. An over-arching aim of policy makers should be to "future-proof" the sector (OCED, 2015). As a successful example of China (OCED, 2011) Egypt just needs to take the same step which helped China to depend on its agriculture to produce enough food for its people, this step is new agricultural policies which support Egyptian farmer, Egyptian agriculture, these new policies are the way to make development on agriculture sector in Egypt. According the Ministry of Supply and Internal Trade, the gross domestic wheat supplies have reached 3.750 million tons, 2013 up 1.6 million tons from the previous season. This increase is equivalent to 77.7% from last year, in which were produced 2.11 million tons of wheat. The main reason of that is that in 2012 and before sowing wheat, government set a fixed high price for wheat yield (FAO, 2016a), which support farmers to cultivate more area by wheat. Here we need to be more clear about that because according to U.S. Department of Agriculture, domestic production will not jump dramatically because Egyptian farmer was suffering from low purchasing power and the lack of credit and the cost of living increase, which does not give him extra money for spending it for agricultural practices or new technology. So we can think what will happen when the government and policy maker in Egypt will put more suitable agricultural policies which can give some support for the main crops, farmers and some inputs. When China success to produce enough food for 18.75% of the world population(UN, 2015) with around 7% of world's arable land (FAO, 2016b), that can give Egypt a way to get more benefits from the Chain's agricultural development successful story and have discussion

about the importance of agriculture and its crucial role in national economic development.

3.2 Farmers Investigation

The study used this kind of materials and methods to understand the importance of farmer's view about agriculture in Egypt through field investigation which was done in December 2015 in Hagaza Keply village, Qena governorate (SIS, 2013), 300 farmers have been chosen, the most important reason to choose this village is because it was a cereal area and now it becomes sugarcane area. In our sample, 69% of farmers preferred to cultivate wheat compared to other crops (Figure 1), but the reason why they did not cultivate it is because of unhelpful agricultural policy which supported imports rather than own domestic cultivation (Figure 2). Farmers got support from the government for different growth stages for some crops such as sugarcane and wheat, rice and maize by providing them with firtilizers as 100% of our sample said (Figure 3).

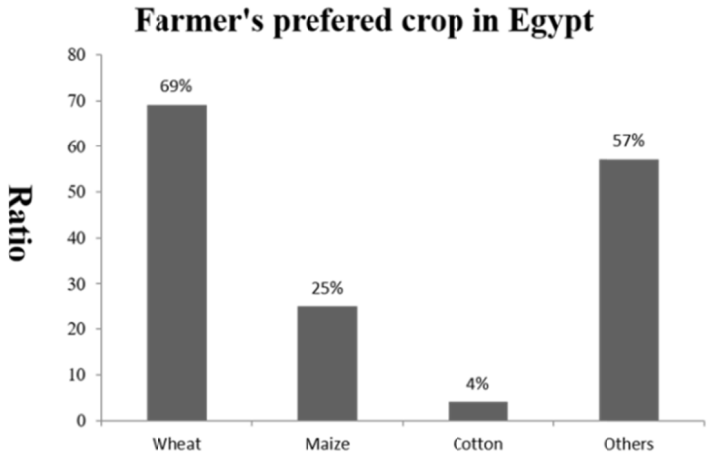

Figure 1. Farmers' prefered crop in Egypt

Source: Farmers' questionnaires and authors' calculations.

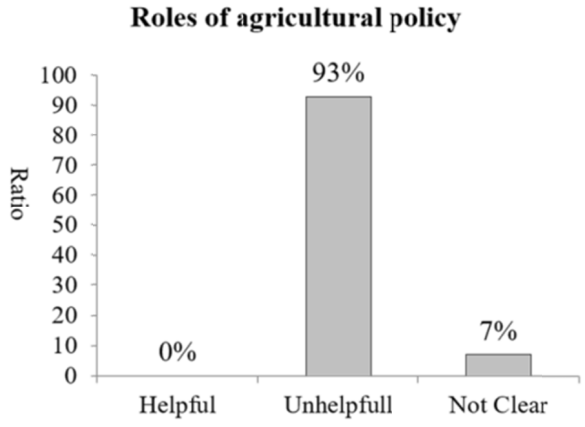

Figure 2. Role of agricultural policy in Egypt

Source: Farmers' questionnaires and authors' calculations.

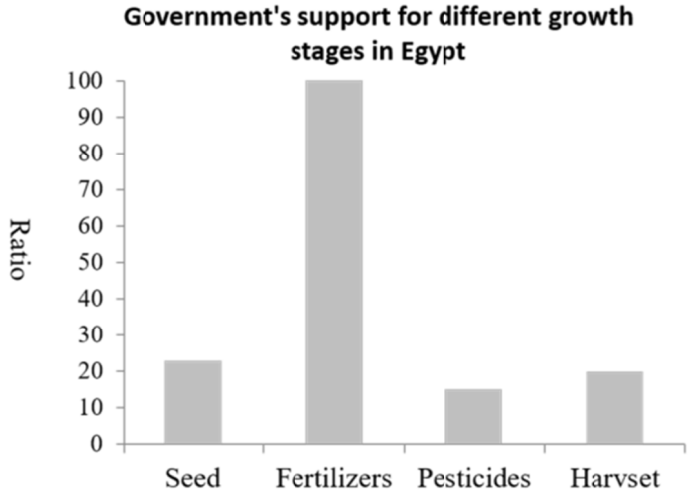

Figure 3. Government's support for different growth stages in Egypt

Source: Farmers' questionnaires and authors' calculations.

When we asked farmers why Egypt is the largest importer country of wheat? 67% of farmers have opinion of inappropriate agricultural policy, 11% farmers estimated that there is no enough land and 13% of farmers have judgment that it is because of insufficient research and technology for the growth of crop production (Figure 4). 76% of farmers outlook that if the Egyptian government want to produce more food it should put new agricultural policy in place, 60% of farmers called for fair prices and 36% of farmers requested for new support for farmers to promote cultivation of grain crops (Figure 5). As 46% of our sample said they expect new policy, 37% said they expect new technology application which will save money and time (Figure 6). At the end of study questionnaires 66% of farmers said prices are the main problem they face and 59% said that workers are the main problem (Figure 7). According to the farmers responses, the study also found out, that Egypt can produce enough food if new government establish new policies, introduce new prices as well as new technology, because that will encourage farmers to cultivate, which is the main plan of Egypt.

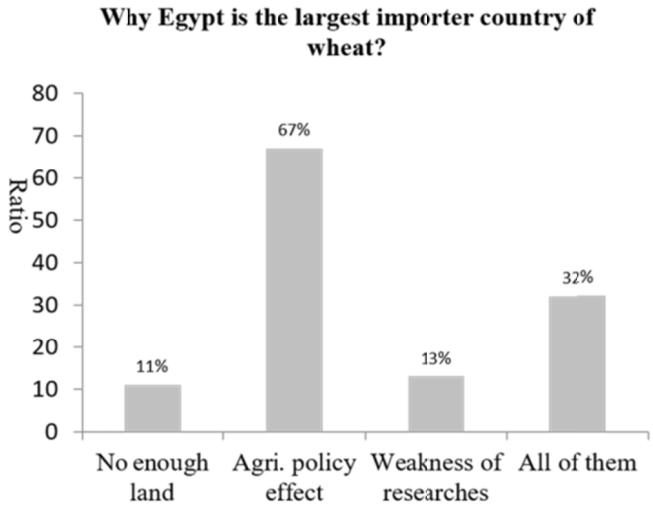

Figure 4. Why Egypt is the largest importer country of wheat?

Source: Farmers' questionnaires and authors' calculations.

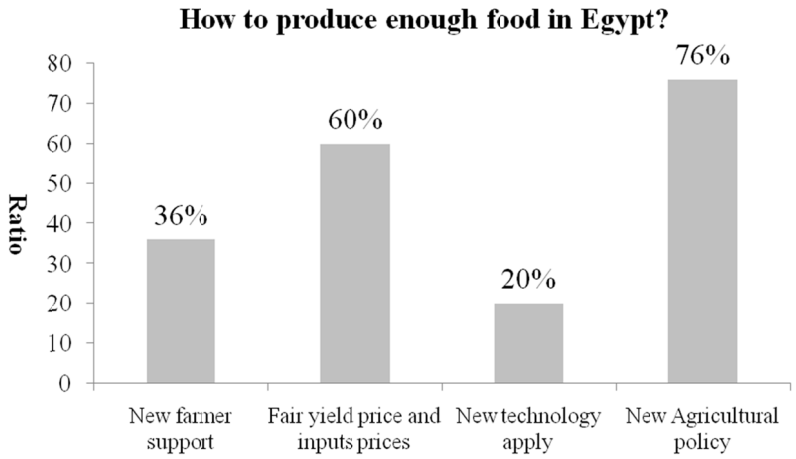

Figure 5. How to produce enough food in Egypt?

Source: Farmers' questionnaires and authors' calculations.

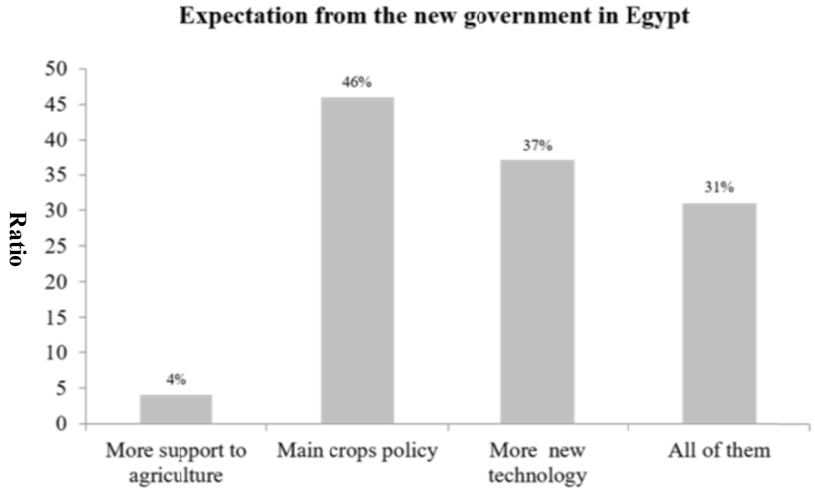

Figure 6. Expectation form the new government in Egypt

Source: Farmers' questionnaires and authors' calculations.

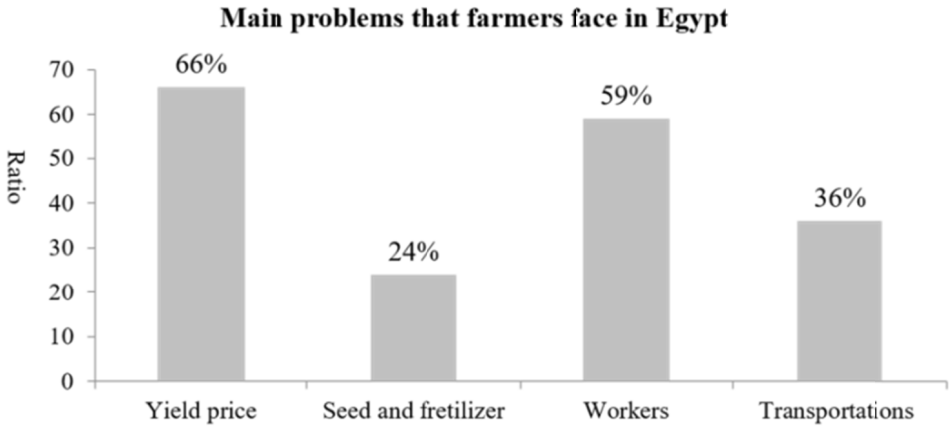

Figure 7. Main problems that farmers face in Egypt

Source: Farmers' questionnaires and authors' calculations.

3.3 Importance of Food Commodities Compared to Desired Cultivated Area According to Current and Rational Consumption

As (Table 1) shows that in Egypt the desired cultivated area depend on the kind of consumptions, this is the first step for successful results for any plan to close the production gaps and understands why Egypt became the largest importer country of wheat. The table below highlights that Egypt should change its way of cultivating, storage, transportation and consumption. As facts are indicating that in Egypt every year there are 20 to 30% loss of wheat because of storage (Ahmed, 2014) (Figure 8).

Table 1. Main crops desired cultivated according to current and rational consumption (million hectares), source of data" Economic Affair sector, Egyptian Ministry of Agriculture and land Reclamation (EAF 2015)

Consumption	2010		2017		2030	
	Current	Rational	Current	Rational	Current	Rational
Wheat	-2.814	-1.897	-1.324	-0.563	-9.97	-0.217
Maize	-1.677	-0.920	-0.131	-0.097	+0.072	+0.209
Rice	-0.000311	+0.106	+0.061	+0.206	+0.130	+0.478

Source: Economic Affair sector, Egyptian Ministry of Agriculture and land Reclamation (EAF, 2015).

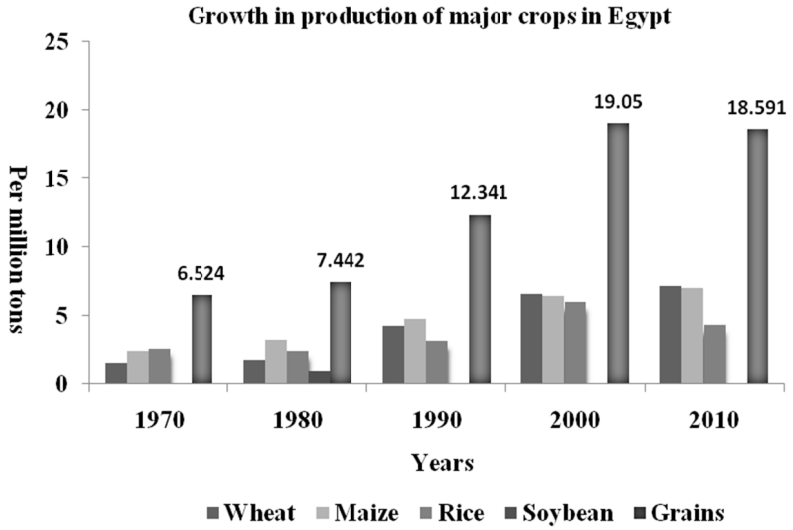

Figure 8. Growth in production of Major Crops—1980 to 2010 in Egypt (millions of tons)

Source: FAO, FAOSTAT 2011, and authors' calculations.

3.4 Wheat Is the Highest Yield and Demands

Wheat in particular, plays an important role in the diet of the Egyptian people, and its population's total need is far greater than the potential for domestic consumption. Political turmoil has complicated the grain market situation since a revolution in 2011 and a further change of government in 2013. In early 1980 the wheat self-sufficiency in Egypt was around 28% and 80% in China, both of the two countries planned to produce more wheat to meet demands of increasing people, after five years. But in 1985, wheat Ss. was decreased in Egypt to 25% and China succeeded to own 100% of its demands (Figure 9). That change because of the agricultural policies in Egypt (Gouell & El Miniawy, 1994), which does not support wheat as a strategy crop and depend on import to feed its people but in China which recognized the importance of its own food, succeeded to produce around 100% of its demands of wheat. In Egypt, the agricultural policies are always the major factor which affected self-sufficiency of wheat and other crops, in 2003, a new minister of agriculture came with an aim to produce more wheat, he succeeded by smart policies to make farmers cultivated more area of wheat for that self-sufficiency start to jump from 59% in 2003 to 62.7% in 2006, but in the middle of 2006 government change that minister and the new one came with aim of cultivating more area by cash crops, he said in the first work day for him " If Egypt has enough money to import wheat, no need to cultivate more area by wheat and we can cultivate more area by cash crops", hence, SS decreased from 62.7 in 2006 to 55.7% in 2007 to less than 50% in 2010. On the other hand, in China, agricultural policies keep supporting the production of enough wheat.

Figure 9. Wheat's self-sufficiency in Egypt

Source: FAO, FAOSTAT 2015 (from 1980 to 2011), Knoema (2015), and Ministry of Agriculture in Egypt (for 2012 and 2013) and authors' calculations.

As Figure 9, showed that Egypt has a huge problem with wheat self-sufficiency, wheat is the most important food crop in Egypt. The average of wheat's self-sufficiency during the last 30 years was 43%, and just 47.6% during the last 5 years. Agricultural policies are the main factor that affected wheat. On the other hand, wheat is the second most important food crop after rice in China. The government made policies supporting wheat. Figure 10 showed that during the last 30 years, China had 92.03% wheat self-sufficiency on the average which increased to 93.11% between 2004 and 2006, jumped to nearly 100% in 2006. That was possible because policies supported that strategic crop and supported farmers to cultivate it.

Figure 10. Wheat's self-sufficiency in China

Source: FAO, FAOSTAT 2015, and authors' calculations.

3.5 Critical Status of Maize Self-Sufficiency

Egypt has problems with maize self-sufficiency, which was 67.2% on the average during the last 30 years. Maize self-sufficiency was 59.6% in the last 5 years (Figure 11). This shortage of maize affected meat production, making meat expensive for Egyptians. In Egypt agricultural policies did not support maize production, so farmers did not cultivate more area (Figure 11). On the other hand, maize self-sufficiency in China averaged 104.75% during the last 30 years, and it was 100.07% as Figure 5 showed. In China maize is widely used to produce meat. China makes agricultural polices to support maize production in order to feed meat animals. This explains why meat in China is available at good prices (Figure 12), one more reason for maize in Egypt, it started to be mixed with wheat to make bread, so needs started to be higher and from this point Ss for maize faces this problems, and the same reason as wheat was the agricultural policy.

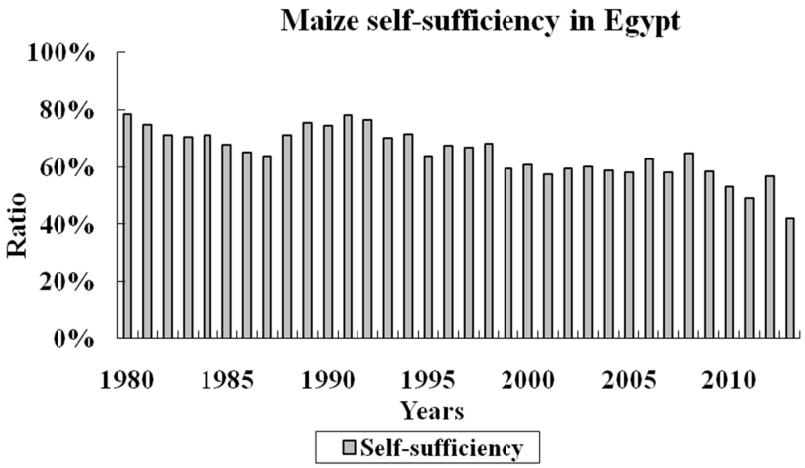

Figure 11. Maize's self-sufficiency in Egypt

Source: FAO, FAOSTAT 2015 (from 1980 to 2011), Knoema and Ministry of Agriculture in Egypt (for 2012 and 2013), and authors' calculations.

Figure 12. Maize's self-sufficiency in China

Source: FAO, FAOSTAT 2015, and authors' calculations.

3.6 Rice Similar Situation in China and in Egypt

Egypt produces rice more than its self-sufficiency. It averaged 110% during the last 30 years. During the last 5 years, the average was 124% (Figure 13). Agricultural policies in Egypt were intended to decrease the area of rice, but farmers were not told what to produce instead, so they did not decrease the area of rice. Farmers in Egypt want to get money soon after harvest. They can do this with rice, not with maize or wheat (Figure 13). On the other hand, rice is the main food crop in China. During the last 30 years rice self-sufficiency averaged 100.70%, and it was 96.23% in the last 5 years. Agricultural policies in China support rice production. Farmers in China say maize is yield, but rice is money (Figure 14).

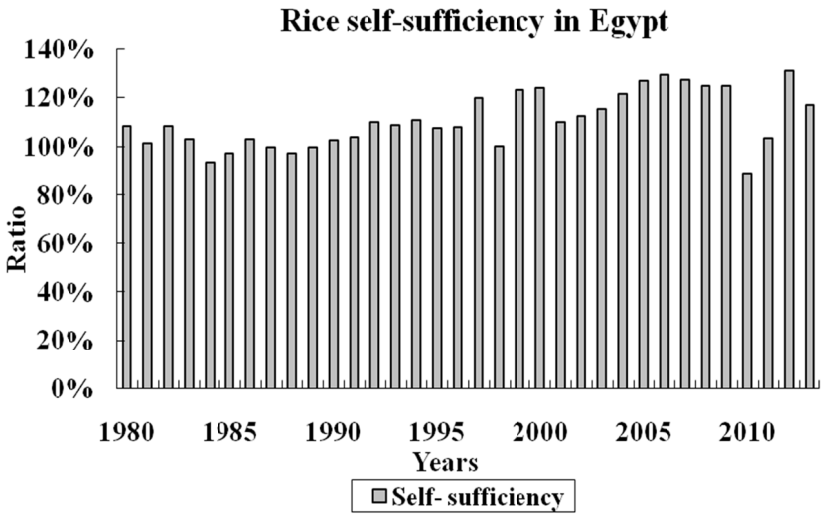

Figure 13. Rice's self-sufficiency in Egypt

Source of data FAO, FAOSTAT 2015 (from 1980 to 2011), Knoema and Ministry of Agriculture in Egypt (for 2012 and 2013), and authors' calculations.

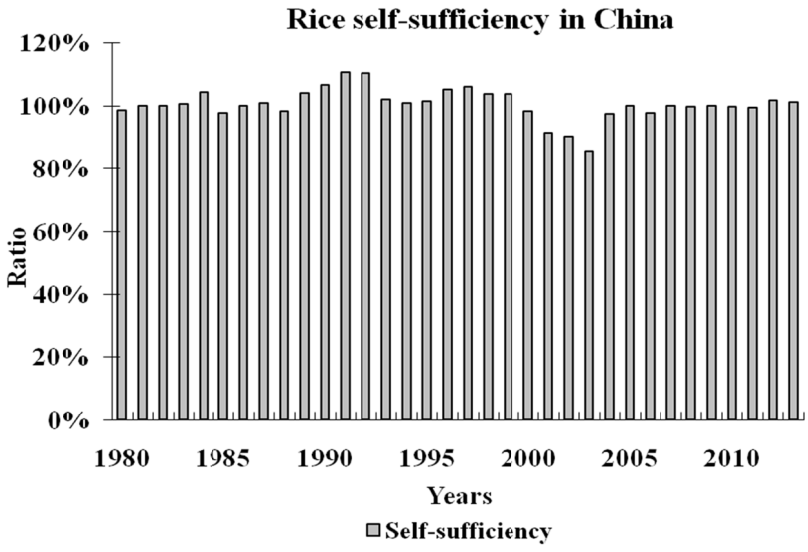

Figure 14. Rice's self-sufficiency in China

Source: FAO, FAOSTAT 2015, and authors' calculations.

3.7 The Challenges of Soybean Demands

The world is now looking to the soya bean as one solution to its future food problems (William & Akiko, 2008). In Africa generally, soybean production from the early 1960s until 1976 increased slowly but steadily. In 1977 it took off, fueled by large increases in production in Egypt and Zimbabwe. By 1981 the African total had jumped to 265,000 tons. The four largest producers were Egypt (136,000 tons), Zimbabwe (97,000 tons), Nigeria (est. 80,000 tons), and South Africa (26,000 tons) (William & Akiko, 2009). In Egypt soybean Ss., averaged 50.97% during the last 30 years. It decreased to 7.59% during the last 5 years after the area of cotton was decreased so Egypt started to depend on soybean as an oil crop. During the last 10 years, Egypt has had a big problem with soybean, huge production gap. More support from the government is needed to make farmers cultivate more area of soybeans in order to close the big gap between need and production (Figure 15).

On the other hand, soybean self-sufficiency in China during the last 30 years was 74.74% on the average, but during the last 5 years, the average was 37.06% (Figure 16) because Chinese started to widely use soybeans as food, China has made new agricultural policies to support farmers to cultivate more area. In addition, soybean research is increasing the yield of new varieties.

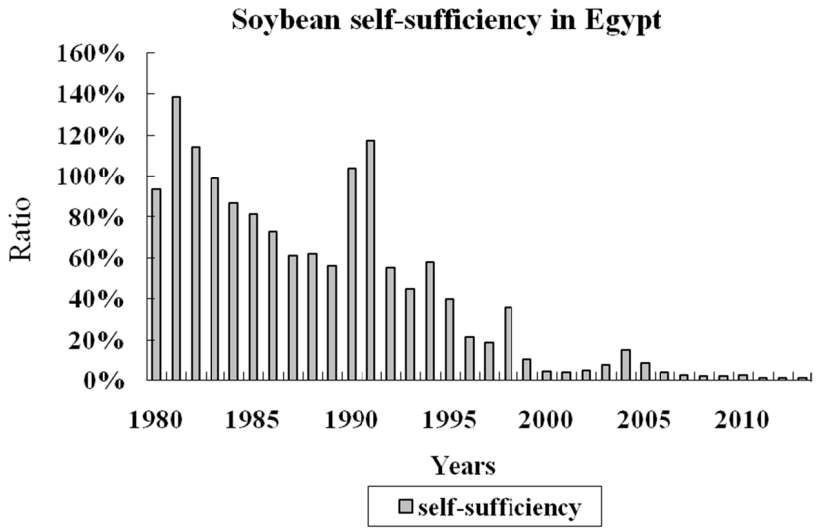

Figure 15. Soybean's self-sufficiency in Egypt

Source: FAO, FAOSTAT 2015(from 1980 to 2011), Knoema and Ministry of Agriculture in Egypt (for 2012 and 2013), and authors' calculations.

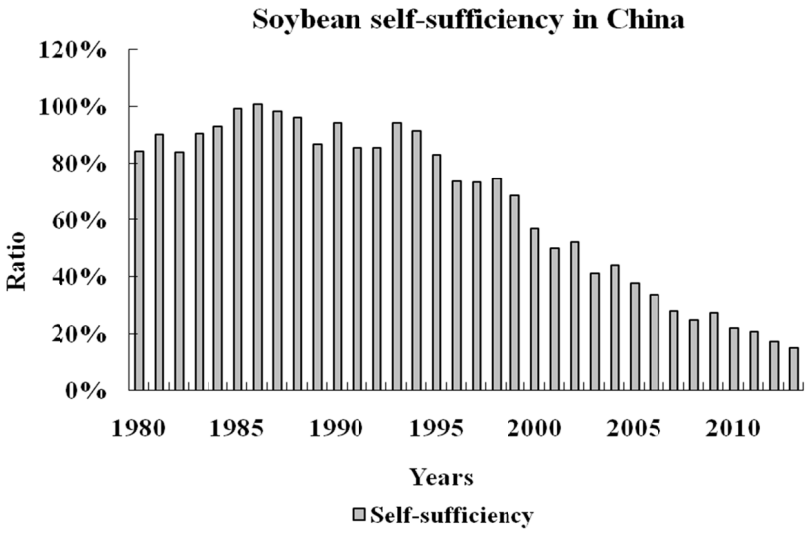

Figure 16. Soybean's self-sufficiency in China

Source: FAO, FAOSTAT 2015, and authors' calculations.

3.8 Grain Production and Agricultural Development

In Egypt, agricultural policies were primarily responsible for stopping agricultural development such that farmers did not produce enough food for the people. Figure 17 showed that grain self-sufficiency in Egypt was 54.64% during the last 30 years, and it was 60.17% during the last years. Agricultural policies did not adequately support farmers, main crops, or research that could have changed Egyptian agriculture to produce enough food for the people. For example, in 2000 the support for research was 100 Million USD. It decreased to 2 Million USD in 2010 (MOF, 2015). Such policies prevent Egypt from achieving self-sufficiency for the main crops.

On the other hand, Figure 18 showed that grain self-sufficiency in China averaged 98.89% during the last 30 years and 96.75% during the last 5 years, China's agricultural policies adequately supported farmers to cultivate more area of main crops and thus produce enough food for its people (OECD, 2011).

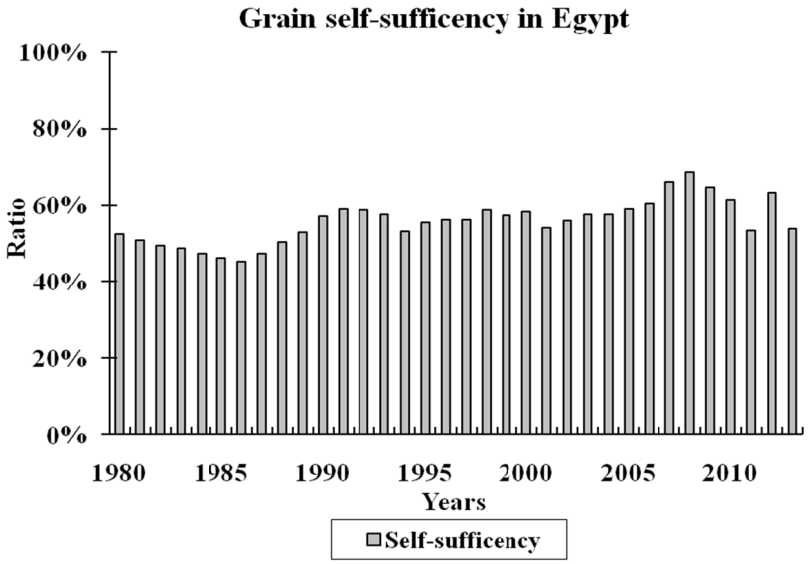

Figure 17. Grain's self-sufficiency in Egypt

Source: FAO, FAOSTAT 2015 (from 1980 to 2011), Knoema and Ministry of Agriculture in Egypt (for 2012 and 2013), and authors' calculations.

Figure 18. Grain's self-sufficiency in China

Source: FAO, FAOSTAT 2015, and authors' calculations.

4. Discussion and Conclusions

Nowadays, international focus on domestic agriculture sector as a main lever to alleviate impact of rising food prices, strong export potential industrialization of agriculture produce, international branding of Egyptian products, and further potential for growth in arable land area. Agriculture sector is the most important for Egypt and China which plays role as a base of the country development on all other fields. China started early 1949 to put agriculture in the middle of all development goals of the country. Understanding of agricultural policies roles in China's successful agriculture development is important to realize, agriculture development in Egypt can has a big leap to produce enough food by starting to change unstable agricultural policies of last 30 years. We run this study on agriculture in Egypt and China from 1980 to 2013. Results show that China's wheat, maize, rice, and grain self-sufficiency were 93.11%, 100.07% 96.23% and 96.75%, respectively. This shows that China provided good support to farmers encouraging them to cultivate sufficient crop area. Results show that Egypt's wheat, rice, maize, and grain self-sufficiency were 47.6%, 59.6%, 124% and 60.17% respectively, showing that Egypt did not give farmers good support to encourage them to cultivate sufficient crop area. Other countries wanted Egypt to produce cash crops rather than wheat and were able to influence Egyptian agricultural policies to that end. Finally, results show that Egypt has experienced many problems with production of main crops during the last 30 years. This caused the country to depend on importation of main food crops. On the other hand, China succeeds in meeting its main crop needs.

In conclusion, this study shows the main reason for the positive successful agriculture in China has been its agricultural policies which have made it possible for China to produce enough food to feed its nation. In contrast, Egypt failed to achieve such target because of its unsatisfactory agricultural policies, which do not support farmers but rather support importation. China done well on the view of supporting main crops and used it is own way to get the goal of its aims of development in agriculture field. Thus, the future studies will be required to investigate more the possible role of agriculture policies in deeply study and making a research on a comparative research on agricultural policies in Egypt and China to give some more wide recommendations not just for policy maker in Egypt but for a lot of countries around the world which China showed them how can make possible from impossible.

5. Recommendations

"It always seems impossible until it's done" (Nelson Mandela, 2004; USA Today Network, 2013).

That is what Egyptian government should learn, based on the findings of the current study agricultural policy is the key in Egypt to be a sufficient country again, Egypt can optimize its negative crop balance and decrease its production gap in the main crops. The government should support the farmers through subsidies, to adopt research developed strategies and technologies, like irrigation water management, intercropping and double

cropping systems, research on main food crops etc. Government should reform the Ministry of agriculture, improve the extension services, and support agricultural researches. Priority should be given to main crops, wheat, rice, maize, sugarcane, soybean, etc.

This research shows that with a little change in the agricultural policies in Egypt, it can optimize its food self-sufficiency and solve a lot of its problems regarding food. The past 30 years agricultural policies were the main factor which affected its agricultural field. Egypt has enough land and resources to make the change and optimize its agricultural situation but the agricultural policies have not been favorable and that has prevented agricultural crop self-sufficiency. Hence, this study found the main recommendation to the Egyptian policy maker to start by agricultural policies as the main step for enough food.

From the China's successful example, this paper highly recommended to optimize food security in Egypt, the Egyptian policy makers should begin by implementing agricultural policies which will improve ways and steps in making food production enough and vitalising rural economy. Improving incentives for farmers and local governments to invest in agriculture, providing input and output price incentives to increase the multiple cropping index and increasing arable land area and improving its quality.

In conclusion Egypt has one way if it wants to change its agricultural situation to produce enough food for its own people which is to improve its agricultural policies for inputs, yield price for main crops.

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