**Analysis of the evolutions of the imported rice and domestic rice productions in Senegal from 2001 to 2009**

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**I Introduction**

Food security becomes a sensitive problem affecting the world. A Country like Senegal that depends mostly on importation is suffering a lot of the spikes of the prices. In the case of the rice, Senegal currently imports more than three quarter of its rice (Ministry of Agriculture). Senegal, according to the National Agency for Statistics and Demography (NASD) is the top ten rice importer. This situation makes it extremely vulnerable to the price fluctuations and supply shortages experienced in 2008-2009. Senegal imports its rice from Asia, Brazil but most of the rice comes from Asia mainly from Vietnam and Thailand. Thailand remains the largest supplier of rice approximately 64% and Vietnam is the next largest supplier approximately 24%.

In fact, broken rice remains the most preferred rice imported with more than 99% of the market share. Thailand remains the main rice supplier in the country with 57% followed by Vietnam 28% and Brazil 11%. Senegalese people, for many reasons prefer the imported broken rice to the long grain rice grown locally.

Yet Senegal has the land and a good climate for rice cultivation and can sufficiently satisfy the domestic needs. The principal zones of production are in the Senegal River Valley and in Casamance in the south. Irrigated rice represents 70% of national production concentrated on 50,469 ha in Saint Louis, Matam region bordering the Senegal River. The biggest production of the domestic rice comes from this part of Senegal. The production is for consumption and for sale.

Rainfall cultivation supplies only 30% of national rice production. Rainfall cultivation is practiced mainly in casamance, fatick and this production is only for family production.

The farmers are still using traditional equipment for rice cultivation. This situation is the reasons why the rice production is very limited. Among other problems encountered by farmers one can mention the limited working capital to deal with smaller quantity of production.

The last three years Senegal policies attempted to change the trend and avoid depending on a volatile international market. The government envisions the rice value chain producing 1,000000 metric tons of white rice annually by 2012 (National Strategy for the Development of the rice sector 2009).The strategies call for investment in public irrigation infrastructures, input subsidies and farmers extension and training. Still, despite the government efforts the importation of local rice remains higher. For that reason, the paper is interested in this study for addressing the situation of dependency on the imported rice. The paper aims to increase the domestic rice production. The first part focuses on the theoretical review. The second part of the paper deals with the methodology. The third part proceeds with analyzing the results. And based upon the analysis, the last part will propose some suggestions.

**II Theoretical review**

Most of African countries like Senegal, Nigeria have seen the increase of rice consumption. This increase is due to the change in the food habits of people and the increase of the population. In Senegal, the economic interest of French colonizers has dictated the choice of rice. Before the introduction of rice Senegalese people, for their consumption used millet peanuts and maize. Today the country is dependent on rice for 75% and it is the case for many countries. Nigeria ranks third with Irak after (Philippines and Chinese) in the group of major rice importing countries in the world (AWE 2006). Such countries like Korea has created agricultural polices encouraging the improvement of the production of domestic rice. The evolution of the imported rice has triggered interest among some scholars. Rice imports have affected the domestic productions and marketing of Nigeria’s local rice. This is due to the decrease of local demand for local rice by Nigerians as opposed to the imported one.(Bamide O.O Aboyoni). The paper Economic Analysis of Rice Consumption Patterns in Nigeria by F.S Bamide O.O Abayomi & O.A Esther reveals how imported rice consumption increases in the Nigerian household. The analytical tools used in the study include descriptive statistics and multinomial logit. The study works on variables like income of the head of the household/ household size and the education status of the head of the household, the price per unit kg. The factors explain the demand differentials between local and imported rice. In the study, the dependent variable is categorical and has taken three nouns. The paper has revealed that factor like quality is very significant and the government has to act on it to increase the domestic rice consumption. For that, the paper has recommended to improve the rice processing.

The paper by Joseph Omoniyi Bassoroun deals with the Relationships of factors affecting rice consumption in a target region in Ekili State Nigeria.The two papers implicitly talk about demand differentials between the imported rice and the domestic one. And they all point out the increase of the quantity of imported rice over the domestic one. Many studies have been interested in the factors affecting the domestic rice production. The findings point out the quality, the lack of means and some socio economic factors (Joseph Omoniyi Bassoroun). In the case of the study, the socio economic factors such as the price, is not of an importance because in senegal although the imported rice is more expensive, rich people and poor people buy it. As far as our study is concerned, it examines only the two evolutions (imported rice production, domestic rice production) and to assess the nature of their correlation.

**III Methodology**

The study uses the data of the evolution of the imported rice production and the domestic rice production from 2001 to 2009. The tools employed for analyzing the study data are pearson’s correlation, percentage and descriptive statistics with the calculation of the covariance and the use of graph to highlight the evolutions of our variables.

The paper uses the correlation methodology to analyze the relationship between the two variables. The p-value is the key element that tells whether they are related. The p- value tells us the probability that we would see the observed relationship between the two variables.

Although the p-value is a powerful indicator of whether or not two variables are related, it is limited. P-value tells us something about our confidence, that there is a relationship but it does not mean the relation is causal. The assertion of statistical significance can depend on other factors. In the case of this study the p-value tells the degree of confidence about the relationship between the two variables but the statistical significance can depend on other factors. The p value used in the study assesses the relationship between the evolution of the imported rice production and the one of the domestic rice production.

The paper uses the model **Y= ax +b** for forecasting the trends of the two productions of rice from 2009 up to 2014

**Evolutions of the imported rice and the domestic rice production (tons)**

**Year Domestic rice imported rice total**

**2001 200000 700000 900000**

**2002 220000 800000 1020000**

**2003 175000 900000 1075000**

**2004 235000 825000 1060000**

**2005 200000 900000 1100000**

**2006 280000 995000 1275000**

**2007 185000 1100000 1285000**

**2008 195000 845000 1040000**

**2009 420000 350000 770000**

**Source: ministry of agriculture**

**Figure 1 domestic and imported rice productions (in tones) from 2001 to 2009**

**Tones**

**Year**

**Figure 2: The trends of the domestic and imported rice from 2009 up to 2014**

**Tones**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **year** | **Dom rice** | **Imp rice** | **Total** |
| 2001 | 200,000 | 700,000 | 900,000 |
| 2002 | 220,000 | 800,000 | 1,020,000 |
| 2003 | 175,000 | 900,000 | 1,075,000 |
| 2004 | 235,000 | 825,000 | 1,060,000 |
| 2005 | 200,000 | 900,000 | 1,100,000 |
| 2006 | 280,000 | 995,000 | 1,275,000 |
| 2007 | 185,000 | 1,100,000 | 1,285,000 |
| 2008 | 195,000 | 845,000 | 1,040,000 |
| 2009 | 420,000 | 350,000 | 770,000 |
| 2010 | 306944.4 | 765972.2 | 1072917 |
| 2011 | 321444.4 | 754388.9 | 1075833 |
| 2012 | 335944.4 | 742805.6 | 1078750 |
| 2013 | 350444.4 | 731222.2 | 1081667 |
| 2014 | 364944.4 | 719638.9 | 1084583 |

**Figure 3: The trends of the two productions up to 2014**

| **상관계수** | | | |
| --- | --- | --- | --- |
|  | | import | Dproduction |
| import | Pearson 상관계수 | 1 | -.752\* |
| 유의확률 (양쪽) |  | .019 |
| N | 9 | 9 |
| Dproduction | Pearson 상관계수 | -.752\* | 1 |
| 유의확률 (양쪽) | .019 |  |
| N | 9 | 9 |
| \*. 상관계수는 0.05 수준(양쪽)에서 유의합니다. | | | |

**Figure 4**

**IV Analysis**

Based on the two evolutions, one evidence appears clearly.the quantity of the imported rice is considerably higher.The domestic rice production represents **22,25%** of the total production while the imported rice production accounts for **77,75%** .**More than three quarter** of the total production is rice imported from other countries. These figures show the strong demand for imported rice in Senegal.The preferrence of people for imported rice can be explained by many factors. Its quality is better than the domestic rice.According to the households domestic rice is hard to cook, is full of stones and is not well processed. In Senegal, the domestic does not sell well. The lack of competitiveness of the imported rice added to the irregularity of water and the lack of equipment explain the week production of the domestic rice. The domestic rice production hardly exceeds **200000** tons it’s only in 2009 that it registers its highest production(420000) which represents **54,54%** of the total production. Also in 2009, the imported rice registers its lowest production. The production decreases drastically and accounts for 350000 tones which represent 45,45% of the total production. This decrease is due to the government agricultural policies.

In 2009, the government through a vast program decided to guaranty food self-sufficiency to avoid the price spikes that make the country vulnerable. Thus, the cultivated area are extended and farmers benefit help from the government.

The correlation is significant at level 0.05 and the results show that the coefficient of correlation.019 is inferior to 0.05 which means that the relation is statistically significant. The coefficient of co variation **(-1079)** gives us clearly the nature of the relation between the two variables. The sign minus of the coefficient implies that the two variables evolutes in the opposite side. It means that when the imported rice production increases the domestic rice production decreases. The relation concerns the two senses. The same remark can be done too for the imported rice production that decreases when the domestic rice production increases. The imported rice production affects the domestic rice production and in return the same remark can be observed for the domestic rice production that affects the imported rice production. For recall, the coefficient of co variation can be high in this case the relation is strong. It can be zero in that case that means there is no relation. And finally, the coefficient of co variation can be negative like in the current study therefore the two variables vary in the opposite side. The picture on the evolutions of the imported and domestic rice shows that mostly when the imported rice production increases the domestic rice production decreases (2002, 2003, 2004, and 2005). On the opposite, when the domestic production increases (2004, 2009), the imported rice production decreases. However in 2001 both of the productions have increased.

The trends of the two productions up to 2014 reveal that the imported rice decrease gradually while the domestic rice increases. From 2010 to 2014 the domestic rice production registers an increase of **58000 tones**. For the same period, the imported rice production accounts **-46333.3** **tones.**

**V Suggestions**

From the results of the analysis, some difficulties encountered by the domestic rice are identified. The imported rice production is higher than the domestic one and to reverse the situation some measures should be taken.

* The government should continue the agricultural policies initiative in 2009 by supporting the farmers with equipments
* The government should promote the local rice through campaigns of sensitization.
* Improvement of the quality of the rice. The quality of the rice is not good because of a poor quality of the processing.
* The trends of the two productions up to 2014 reveal that an increase of the domestic production. So in order to achieve a rice self sufficiency, the government should extend the cultivated areas, help farmers to have access to water.

**VI Conclusion**

The evolutions of the two productions show a net difference. From 2001 to 2008 the production of imported rice is far more important. It is only in 2009 that the trend reversed. The domestic rice accounted 420000 tons. We remark that in 2009 the total production is the lowest related to the government policy for encouraging the consumption of local staple food like millet, maize.

It is evident from the study that the two variables are related. The coefficient of correlation inferior to p 0.05 the significant level of correlation is evidence that the variables are related. However, it does not mean that it is a causal relation. As it was précised above, other factors can affect the variables.

The study through the calculation of the co variation reveals that the two variables vary in the opposite sense. It means that when the imported rice production increases, the domestic rice production decreases and in the reverse when the domestic rice production increases, the imported rice production decreases. In 2009, with the Grand Offensive for food and Abundance (a Program initiated by the government of Senegal), the domestic production was considerably increased compared to the imported rice that decreases significantly. We remark the trends of the two productions up to 2014 display that the domestic rice increases while the imported rice decreases.

This situation implies that with real agricultural policies, Senegal can reach his rice self sufficiency.

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