



# High Rice Import as a Threat to Food Security and a Hindrance to Sustainable Rice Production in Ghana

Ayisi Daniel Nyarko<sup>1\*</sup> and Zsuzsanna Kassai<sup>1</sup>

<sup>1</sup>Faculty of Economics and Social Sciences, Szent Istvan University, 2100 Ut 1 Godollo, Hungary.

## Authors' contributions

This work was carried out in collaboration between both authors. Author ADN designed the study, managed the literature searches, performed the statistical analysis, wrote the protocol and the first draft of the manuscript. Author ZK reviewed the first draft, corrected the grammatical and technical errors. Both authors read and approved the final manuscript.

## Article Information

DOI: 10.9734/ACRI/2017/33016

### Editor(s):

(1) Kazutoshi Okuno, Japan Association for Techno-innovation in Agriculture, Forestry and Fisheries (JATAFF), Yachiyo, Japan.

### Reviewers:

(1) Ume Smiles, Federal College of Agriculture Ishiagu, Ebonyi State, Nigeria.

(2) Edward Tsinigo, Innovations for Poverty Action, Ghana.

Complete Peer review History: <http://www.sciencedomain.org/review-history/18841>

Original Research Article

Received 27<sup>th</sup> March 2017

Accepted 25<sup>th</sup> April 2017

Published 28<sup>th</sup> April 2017

## ABSTRACT

**Aims:** The main objective of this study is to analyse the extent to which Ghana depends on rice import to satisfy domestic food needs and how it affects domestic rice production.

**Study Design:** The study employed a case study technique.

**Methodology:** Both quantitative and qualitative methods were used. Secondary data from the databases of the Food and Agriculture Organization of the United Nations, the Ministry of Food and Agriculture, the United States Department of Agriculture, Index Mundi and other sources were used. The data of domestic rice production, imports and consumption were studied over a ten-year period. The average annual consumption per capita values were obtained by dividing the total annual rice consumption for each year by the total population for that particular year.

**Results:** It was observed that rice imports in Ghana outweigh its domestic production level; it has an imports dependency gap of 61.08% which was 568 thousand metric tonnes in 2014. Also Government expenditure on rice imports stood at 500 million US dollars in 2014, which represented a 259.87% increase since 2005.

**Conclusion:** It was concluded that Ghana is food insecure in terms of rice consumption; since it depends largely on imported rice to meet its domestic demand. Therefore, any decisions by the leading rice exporting countries to ban or reduce the quantity of rice supply to Ghana may cause

\*Corresponding author: Email: [wonsign@gmail.com](mailto:wonsign@gmail.com);

food shortage and hunger.

It was therefore recommended that the government should allocate a quota to rice imports instead of increasing import tariff, and more resources should also be allocated to rice production to expand the current production levels.

*Keywords: Rice; imports; food security; consumption; production; rice policy; Ghana.*

## 1. INTRODUCTION

Global rice trade has shifted upwards by 71% from 12 million metric tonnes (milled) in the early 1980s to 47 million metric tonnes in 2012 [1]. The annual production is estimated to be about 496 million metric tonnes in milled form; and constitutes the main staple food for about 3.5 billion people worldwide [2,3]. Rice is noted to be the fifth most important source of energy in a diet, accounting for about 9% of total caloric intake [4].

Africa is witnessing an increasing demand for rice consumption, and many countries on the continent continue to rely heavily on imports for meeting their growing rice consumption needs [5]. The import of rice by African countries increased from 5 million metric tonnes (140%) in the early 1990s to about 12 million metric tonnes in 2004 [6]. This was estimated at about a quarter of the total global import, with an import value estimated at USD 2.5 billion [6]. In 2015 it was reported that Africa imported 14.5 million metric tonnes of rice; which represented 34 percent of the global import in the same year [7,3]. In the early 1990s, West African countries also increased their rice imports from 4 million metric tonnes (USD 0.8 billion) to 8 million metric tonnes (USD 1.6 billion) in 2005. This represented two-thirds of Africa's rice import [6]. In 2015 West African countries alone imported 9 million metric tonnes of rice, which was equivalent to 40.9% of Africa rice import total in 2015, compared with 1.7 million metric tonnes in the early 1990s [7,3]. It is projected that West African rice import will reach 10.1 million metric tonnes by 2020 [8].

Rice has become a commodity of strategic significance across the Ghanaian society. It is also the second largest cereal consumed after maize [9]. The consumption of rice in Ghana has seen a tremendous growth from about 790,000MT in 2010 to around 926,000MT in 2015 [10]. The sharp increase in consumption can be attributed to changing consumer behaviour, population growth, urbanization, increase in income, ease of cooking and storage

of rice [11]. It is observed that Ghana relies heavily on imported rice to meet its local consumption. On the average, Ghana spends a colossal amount of about 4.5 Million USD of its scarce foreign currency annually on rice imports [12]. The self-sufficiency ratio of rice in Ghana was more than 90% in 1976 and gradually reduced to 63.3% in 1982 and further declined to 38% in 1999 and to 24% in 2006 [6]. Furthermore, the dependency on imported rice in Ghana started increasing steadily in the 1980s, and now it accounts for more than 70% of local consumption.

Ghana has made a significant progress in its economic development as the Millennium Development Goal of reducing poverty by 2015 was met in 2013, by reducing poverty from 52% in 1991 to 24% in 2013. Improvement in the living standards has influenced household consumption in both the urban and rural areas to contribute greatly to the high demand for rice in the country [13]. It is also estimated that Ghana's current population will increase from 27 million to about 60 million by 2050, and that due to the rise in global population, net food importers like Ghana would experience significant losses in food access, thereby making Ghana more vulnerable to food security [14].

It is also forecast that close to 1.3 billion people may be at longer-term food insecurity by 2050 in low-income economies like Ghana, if their economic development will not allow them to be self-sufficient in food production and cropland expansion [15].

Quarshie [16] indicated that the northern part of Ghana alone has a lowland capacity of more than 400,000 hectares for rice production, but only 3,000 hectares are under production currently due to lack of sector investments. According to Asuming-Brempong [17], Ghana has a comparative advantage in the production of paddy rice over the other African countries. However, it has a disadvantage in the processing and distribution of rice, due to the high cost of processing and poor transportation systems and is therefore uncompetitive on the market when compared with imported rice.

The government accepted International Monetary Fund's (IMF) and World Bank's credit conditions and adopted the Structural Adjustment Programme in 1983. As part of the IMF conditions the government withdrew subsidies offered to commercial farmers, and since then there have not been much incentives for farmers to expand their production and further improve the quality of their produce [18]. This has led to high rice import annually. It was estimated in 2013 that Ghana spent on average 4.5 million USD annually to import 70% of the rice consumed in the country [19].

There is also a paradigm of Ghanaians salivating for foreign rice due to its higher quality as compared to the local rice, which has opened the floodgate for higher investment into rice imports by private companies than investing into local rice production. This has consequently increased rice importation annually, thereby indirectly patronizing foreign farmers and emasculating the indigenous producers. This practice has snowballed into a dependency syndrome and neo-colonialism, which on the long term is affecting agricultural development and food security in Ghana [20].

It is estimated that Ghana's population will double by 2050 which indicates that there will be more demand for energy which is taken from carbohydrate foods of which rice is the most common one among them. FAO has also predicted a reduced food supply to the developing countries by 2050, if individual countries are not able to put up mechanisms to ensure sustainable food supply in the midst of climate change [21]. Also political and economic conditions prevailing in rice exporting countries may cause them to cut down or ban rice supply to the world market, when this occurs, Ghana which depends on importation for about 70% of its rice consumption deficit will be struck down by hunger which will be a blow to the economy. For example, during the food crisis of 2007/2008, when food price spikes led to government-imposed ban, restrictions, quotas and higher taxes on exports in various countries. Several rice importing countries such as Ghana, and Burkina Faso, among others could not import much rice to satisfy domestic demand, this caused lack of food supply which affected national food security. It is against this background that this paper seeks to analyse the extent to which Ghana depends on rice import to satisfy domestic food needs.

## 1.1 Main Objective

The main objective is to analyze the extent to which Ghana depends on rice import to satisfy domestic food needs.

## 1.2 Specific Objectives

Specifically, the study sort to;

- Examine the total annual rice consumption per capita in Ghana.
- Evaluate the annual imports gap between consumption and domestic production in Ghana.
- Assess government expenditure on rice imports annually.
- Study the rice sector policy and its contribution to domestic rice production.

## 1.3 Research Questions

- What is the per capita rice consumption in Ghana annually?
- What is the annual imports gap between consumption and domestic production in Ghana?
- What amount does government spend on rice import annually?
- Has rice sub-sector policy so far helped to improve domestic rice production?

## 2. MATERIALS AND METHODS

The paper includes a case study combined both quantitative and qualitative methods. The quantitative part of this study used secondary data from the databases of the Food and Agriculture Organization of the United Nations, the Ministry of Food and Agriculture, the United States Department of Agriculture, Index Mundi and some other sources. The domestic rice production, imports and consumption data were studied over a ten-year period. These data were tabulated; domestic and imported figures were compared. The average annual consumption per capita values were obtained by dividing the total annual consumption for each year by the total population for that year. Import values were also analysed in monetary term (USD).

The qualitative part examined the Ghana rice sector policy and additional information were gleaned through the internet from diverse sources such as scientific journals, technical reports of international research work on poultry enterprises and press releases on rice trading.

### 3. RESULTS AND DISCUSSION

#### 3.1 Domestic Rice Production and Imports Trend in Ghana

Fig. 1 shows that in 2005 domestic rice production was 184 thousand metric tonnes while 424 thousand metric tonnes were imported in the same period. This gave an import gap of 69.74%. However, in 2006 both domestic production and imports dropped by 18.48% and 5.66% respectively, but domestic production dropped more than imports making total rice imports dependency for 2006 reach 400 thousand metric tonnes which shows a dependency level of 72.73%.

The drop in import could be attributed to the reduced in rice supply to the global market, followed production challenges faced by major rice exporting countries. FAO [22] reported that world paddy production in 2006 had deteriorated, reflecting a bleaker outlook for crops in Asia which were affected by persistent drought problems, monsoon floods, insects and diseases. The lower outputs in local production could be the drought that occurred in 2006 since major rice farms in Ghana are rain fed. There was also a severe energy crisis in Ghana in 2006 which may be a contributing factor to lower agriculture and industrial sector production. Centre for Policy Analysis [23] reported that the energy crisis in 2006 necessitated what has been described as an "expensive and embarrassing" load shedding exercise in Ghana, which adversely affected production and output particularly in the energy sensitive mining and quarrying, agriculture and manufacturing sub-sectors. In 2007 both domestic production and imports recorded the least value among the ten-year period (Fig. 1). This shows a 23.75% deviation in imports from 2006 and a 26.00% deviation in domestic production in the same year. The total rice imports dependency for the same year decreased to 65.87%, which was not a result of domestic production performance but a decrease in rice supply in the global market. This sharp deviation could be ascribed to the world food crisis that started in 2007 following the increased oil prices, the greater demand for biofuels and the lower output from agriculture [24]. This consequently spiked high price of grains especially rice, which compelled major rice producing countries such as India, Thailand, Vietnam, USA and others to double rice prices. Others also regulated the quantities they supplied to the world market while others banned

rice export temporarily. Local production was also affected as a result of prolonged drought in the country. The European Commission [24] economic analysis revealed that both weather shocks and trade restrictions were significant drivers in the near doubling of rice prices. In addition, Ukraine and other major cereal exporters restricted or banned exports due to poor harvests and to protect domestic prices. Cudjoe et al. [25] also revealed that most analysts agreed that a mix of rising oil prices, US dollar depreciation, biofuels policies, market speculation and temporarily imposed trade restrictions contributed to the rapid surge in food prices during the 2007-2008 food crisis.

Rice import in 2008 increased from 305 thousand metric tonnes to 352 thousand metric tonnes, although the crisis extended to 2008, the rice supply to the global market resumed in the middle of 2008. Vietnam, the second largest rice exporter in the world lifted the ban placed on rice export in 2008 [28]. This development increased rice in the global market in the mid of 2008. Additionally, Ghana imported rice from Ivory Coast to beef up stock in the country. Although Ivory Coast was a net rice importer in 2008, following the Vietnam rice ban lift, the Ivorian government scrapped off the 12.5 % import tariff on rice to enable more rice imported to save the food crisis situation, this created an opportunity for businessmen to reimport rice to Ghana, who by then charged 20% import tariff on rice [29]. Local production also increased due to the high demand for rice and the attractive prices its commanded. These motivated local producers to increase their production, government also provided incentives to farmers such as free seed, fertilizers, among others. Towards the end of 2008 government scrapped off the 20% import duty on rice, this opened door for more rice to be imported in 2009 which raised the import volume from 352 thousand metric tonnes in 2008 to 365 thousand metric tonnes in 2009 given an imports dependency of 60.83% in 2009 (see Fig. 1). This confirms what Food Security Ghana [29] wrote that government scrapped a 20% import duty on rice in 2008 amidst the 2007-2008 food crisis to help increase rice import and food supply in the Ghana. In the beginning of 2010 the government introduced the 20% import tariff on rice to protect domestic production [29]. This did not affect rice import, it rather increased it by 35.62%, from the previous year while domestic production also increased by 25.53% in the same year. This showed a trend of 1.82% increase in imports

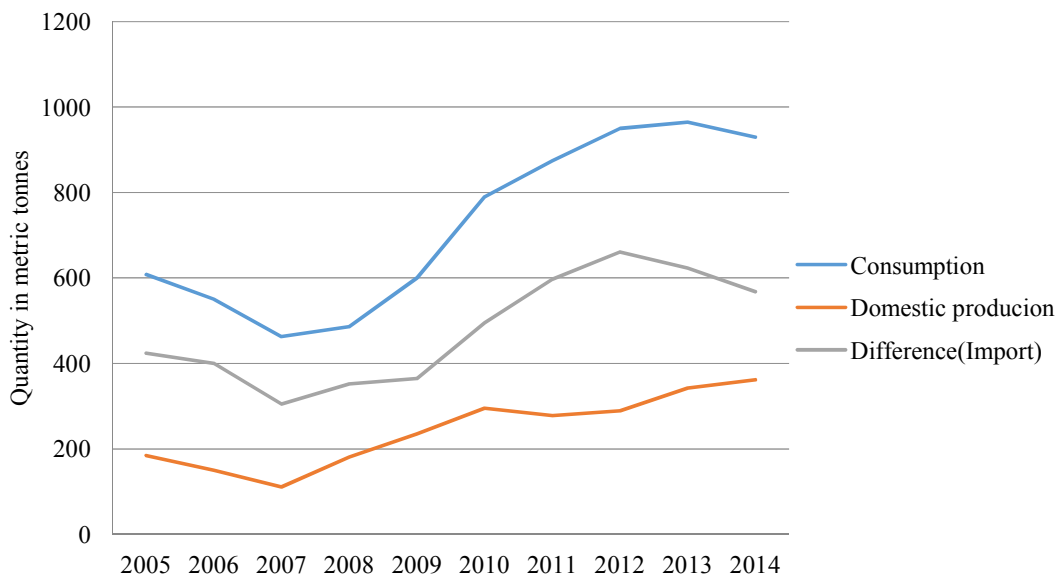
dependency level from 2009. Amanor-Boadu [30] argued that Ghanaian consumers have a higher preference for imported rice because of its perceived higher cooking and sensory characteristics and quality, and that expanding domestic production without improvement in quality would not alter consumers' preferences for imported rice.

Furthermore, Fig. 1 shows that 2012 recorded the highest level of rice import which represents 661 thousand metric tonnes. Domestic production dropped from 295 thousand metric tonnes in 2010 to 289 thousand metric tonnes in 2012, given an imports dependency gap of 69.58% in 2012. The increase in import could be attributed to the bumper harvest in the major rice producing countries which increased rice supply to the global market in 2012. FAO [31] rice forecast review in December 2012 revealed that paddy rice production reached 729 million metric tonnes, which was 0.7% above the 2011 production record, the increase occurred as a result of area expansion to 163 million hectares in the same year. Rice imports dropped from 661 thousand metric tonnes in 2012 to 623 thousand metric tonnes in 2013 and 568 thousand metric tonnes in 2014, these represent 64.56% and 61.08% imports dependency gap in 2013 and 2014 respectively (see Fig. 1). ISSER [32] argued that, the reduction in rice import on the other hand, could be attributed to the economic crisis that Ghana faced from the beginning of

2013 as a result of increased crude oil prices in the world market, electricity supply constraints, and deterioration of the Ghana cedis against the US dollar. It was observed that within the two years food prices doubled; this affected food consumption especially imported rice.

Domestic production on the other hand, experienced a fluctuation growth from 2012 to 2014 (see Fig. 1). Amanor-Boadu [30] analyzed that; the improvement in domestic production could be the agriculture sector commitment to increase rice yields by introducing improved high-yielding, disease-resistant rice varieties to producers and assisting them to adopt low-cost water-management practices, subsidizing fertilizers for rice production.

Additionally, Fig. 1 shows that domestic rice production started decreasing from 2005 to 2007 (39.67%) follow the drought and economic situation that betided the world during these periods. Production started increasing after 2007 to its highest level in 2012 (see Fig. 1) as a result of government interventions and also the increased benefit of rice to farmers in the form of higher price. Imports followed the same trend of reducing from 2005 to 2007 until it started increasing from 2008 and reached the highest level of 661 thousand metric tonnes in 2012 (Fig. 1). At the end of 2014, Ghana's rice imports gap had reduced to 568 thousand metric tonnes which showed 61.08% imports dependency rate.



**Fig. 1. Domestic rice production and imports trend in Ghana**

Source: authors' editing based on [10; 26; 27];

Furthermore, it could be observed that rice imports moved on a fluctuation trend from 2005 to 2014 in response to the economic situation in the world market, as well as domestic economic situations. Rice imports increased whenever there were lower prices on the global market as well as the volume available on the market. In 2010 the government increased the tariff on imported rice by 20%, but it can be seen from Fig. 1 that it did not affect import levels. It can also be seen that after the 2007-2008 global food crisis, rice imports had increased by 33.96%. This implies that Ghana is still a net importer of rice and depend highly on imported rice to satisfy domestic demand. Kwofi [33] reported that in Ghana rice import is on the increase due to the high demand for the rice, particularly the perfumed brands, many business people have found rice importation as a lucrative venture and are importing from all sources around the world. Amanor-Boadu [30] in his analysis of consumer preference of rice observed that Ghanaian consumers have a higher preference for imported rice because of its perceived higher cooking and sensory characteristics and quality. Finally, it can be concluded from Fig. 1 that Ghana is food insecure in terms of rice consumption. Mugisha [34] asserted that a country may be vulnerable to food insecurity since its food availability and accessibility may depend on the political, social and economic stability in food exporting countries. Contrary to Mugisha, Toni [35] argued that in the current world development relations and economy, it is unlikely for a country to have any serious problem for depending on import.

### 3.2 Ghana's Expenditure on Rice Import

The Fig. 2 shows that in 2005 Ghana spent 138.94 million USD on rice import, this amount further increased in 2006 by 20.53 million USD, making a total of 159.47 million USD; which shows a 14.78% increase. It could be recalled in Fig. 1 that rice imports in 2006 decreased by 5.66% but the amount spent on rice import increased by 14.78% in the same year (see Fig. 2). The reason could be the crude oil price spike in 2006 which increased the prices of food products on the international market [36]. The 2006 drought that occurred in the major rice producing countries could also be another factor. There was a 1.01% drop in the amount spent on rice import in 2007 compared with 2006. Fig. 1 showed that 2007 recorded the least rice import in Ghana, but in Fig. 2 the expenditure on rice import did not show any significant changes.

About 157.86 million USD were used to import 305 thousand metric tonnes of rice in 2007 compared to 138.94 million USD spent on importing 424 thousand in 2005. This means that if Ghana had consumed the same quantity of rice consumed in 2005 it would have spent 219.45 million USD which would have been 57.95% increase within two years. This can be linked to FAO [37] report, that after increasing slowly and steadily from historic lows, world rice prices tripled in just six months during 2007-2008. The price increment occurred when the major rice producer banned rice export to protect its domestic consumption. The same trend followed in 2008, when a high amount of money was spent on importing little amount of rice (see Fig. 2). Fig. 2 further shows that the amount spent on rice imports dropped from 218.5 million USD in 2009 to 200.88 million USD in 2010, although Fig. 1 from previous page showed 35.62% increase in rice import in 2010 from 2009. The reason for the higher imports with a smaller amount could be related to the World Food Programme's 1319 metric tonnes rice aid to Ghana in 2010 which was not recorded as government expenditure [26].

The highest amount spent on rice imports was in 2014, which recorded 500 million USD. Fig. 2 shows that the amount spent on rice import has quadrupled over the ten-year period, which indicates a 259.87% increase from 2005 to 2014. The observed trend of Ghana's expenditure on the import of rice is an indication that the country highly patronizes imported rice at the expense of its investment into domestic rice production. FAO [38] reported that high and growing dependence on food imports worsen country's economy and if it continues for a longer time it may create financial explosive situations. Chen [39] also argued that high import is often recognized as a leakage of revenue of which will lead to unemployment rather than economic growth.

### 3.3 Rice Consumption Trend in Ghana

Table 1 shows that the total rice consumption in 2005 was 608 thousand metric tonnes, which denotes 29.10 kg per capita. It however reduced in 2006 by 58 thousand metric tonnes, which shows a 9.54% (3.42 kg per capita) drop in consumption. This could be attributed to the changes in the global rice supply. For instance, in 2005 the global rice production increased in yields which led to higher supply on the world market; which was also characterized by lower price. Ghana being a rice importing country; increased its imports from 254 metric tonnes in

2004 to 424 metric tonnes in 2005 which led to a higher rice supply on the Ghanaian market and subsequently higher consumption [26]. Unfortunately, in 2006 there was 10% petroleum price adjustment in Ghana which triggered massive increase in food prices of which rice was affected. This could account for the 9.54% drop in rice consumption. A comparative analysis of fuel price increase on Ghana's economy by IMF [40] revealed that, a 20% petroleum price increase leads to a 3.4% increase in household expenditure in Ghana; which results in increased food prices such as milled grains, vegetable oils, wheat, and others due to their sensitivity to transport costs.

It can be seen from Table 1 that the least per capita consumption occurred in 2007 (21.07 kg per capita) and 2008 (21.57 kg per capita) which shows 16.00% drop from 2006. This sharp drop could be attributed to the food shortages that hit the world market from the latter part of 2006 to 2008, due to the conversion of cereals to biofuels in the face of high oil prices and trade decisions by major rice exporting countries that restricted rice export.

The European Commission [24] analysis of the causes of the 2007-2008 global food crisis revealed that the primary causes were a combination of rising oil prices, a greater demand for biofuels by wealthy countries and trade shocks in the food market on the price of grain commodities. Which then doubled the price of grain thus effecting developing countries to suffer most during this period. Childs and Kiawu [41] also asserted that major rice exporting countries like Vietnam and India banned rice export to the global market following the 2007-2008 crisis, which fueled the shortage of rice and its price increase in most developing nations. Cudjoe et al. [25] also had it in their analysis of the food

crisis impacts on Ghana that the impacts of surged food prices and reduction in food consumption were dependent critically on macroeconomic conditions, the country's net international trade position and the food production patterns of the nation.

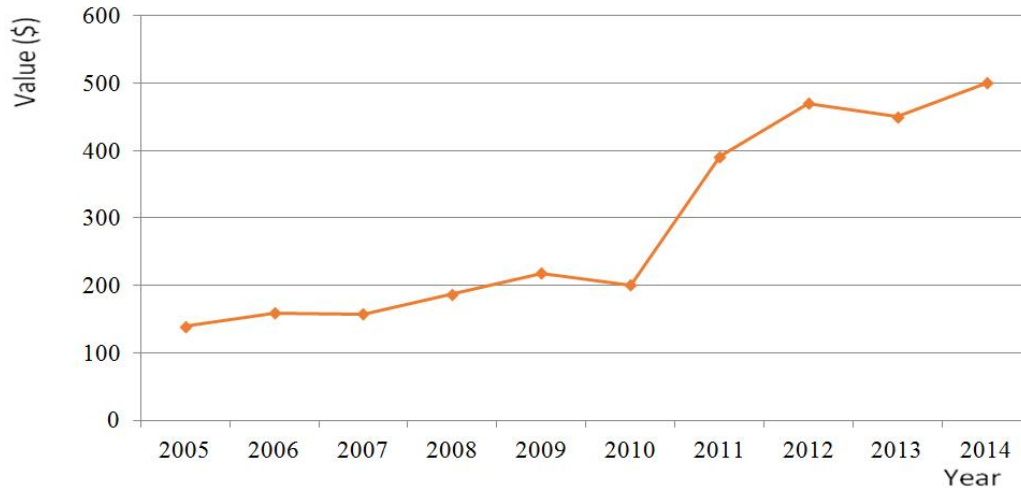
It is further observed from Table 1 that rice consumption in 2009 rose by 114 metric tonnes and 4.4 kg per capita from 2008. It should be noted that in the late 2008 the government of Ghana waived off the 20% tariff on imports of rice to enable more rice imported in 2009 to save the country from the perils of the food crisis. Although this action did not reduce rice prices in the country, it contributed to its availability on the market, which may have accounted for increased in rice consumption. Rice per capita consumption increased from 25.96 kg in 2009 to 33.33 kg in 2010, which shows a 22.11% change. This could be attributed to the ban lifted on the supply of rice to the world market by the leading rice producing countries such as Vietnam [40]. The economy of Ghana also experienced tremendous improvement in 2010 as its inflation reduced from 16% in December 2009 to 8.8% in December 2010. This improvement in the economy maintained food prices at a lower level, especially local produced rice, which may have contributed to the increase in the per capita consumption of rice.

The highest per capita consumption of rice was recorded with a value of 38.11 kg in 2012, which indicates a 30.96% increase since 2005. FAO [4] reported that the global milled rice production increased to 485.9 million metric tonnes in 2012 from 480.7 million metric tonnes in 2011, which represents a 1.08% increase. It concluded that the increase in production brought prices down on the international market which also increased Africa's imports by 8%, especially in West Africa.

**Table 1. Rice consumption trend in Ghana**

<b>Year</b>	<b>Population</b>	<b>Consumption (metric tonnes)</b>	<b>Consumption (kg/capita)</b>
2005	20.89	608	29.10
2006	21.42	550	25.68
2007	21.97	463	21.07
2008	22.53	486	21.57
2009	23.11	600	25.96
2010	23.70	790	33.33
2011	24.30	875	36.00
2012	24.93	950	38.11
2013	25.56	965	37.75
2014	26.22	930	35.47

Source: Authors' editing based on [10]



**Fig. 2. Ghana's expenditure on rice import (in USD)**

Source: Authors' editing based on [26,27]

Another reason for the increased consumption in 2012 could be political influence. Ghana held elections in the same year, therefore, the government did not increase fuel price. Although there was price increase in the international market; fuel price adjustment has a greater influence on food consumption in Ghana [42].

It could be also observed that per capita consumption reduced by 0.4 kg in 2013 although the total consumption volume increased by 15 thousand metric tonnes, but could not balance with the population growth. Per capita consumption further reduced from 37.8 kg in 2013 to 35.5 kg in 2014. This steadily decline in per capita rice consumption in the two years may be the consequence of the economic crisis in Ghana from the beginning of 2013, followed by the fuel price increase, the erratic power supply and the depreciation of the Ghana cedis. This situation caused a sudden increase in food prices, transport fare and utilities in the country which affected food prices. Kwakye [42] asserted that the inflation that was at a single digit for two-and-a-half years between June 2010 to December 2012 rose steadily from 8.8% in December 2012 to 14.5% in March 2014 as a result of the currency depreciation, periodic upward adjustments in fuel and utility prices, and rising food prices.

### 3.4 Rice Sector Policy

Ghana's policy strategies for the rice sector is captured in FASDEP 1, GPRS 1 & 2, MTADP,

AAGDS of the Ministry of Food and Agriculture. The policy sought to promote rice production to address food security and poverty reduction. It is targeted to reduce rice imports to 30% by maximizing production levels to about 370,000 metric tonnes per annum to ensure self-sufficiency in food by 2018. The key measures to realize this dream are increased mechanization, increased cultivation of inland valleys and efficient utilization of existing irrigation systems. Furthermore, improvement of the existing varieties to meet consumer needs, increased seed production and utilization are to be pursued vigorously [6].

The rice sector policy strategic plan has focused on seven thematic areas: land development and management, seed production, capacity building, research and development, micro credit management, processing and marketing [6]. The policy initiatives of the rice sub-sector seek to: (i) adopt value chain approach to agricultural development with emphasis on value addition and market access, (ii) build capacity to meet challenges of quality standards on the international market, whilst focusing on increasing productivity along the value chain, (iii) scale up appropriate land and water management practices in various farming systems, (iv) build stronger partnerships between government and the private sector, (v) develop FBOs to improve small-holder access to services and (vi) enhance support to commercial farming ventures [6].



The summarized rice policy document above shows that there are lay down plans to improve the rice sector performance to meet domestic demand through the application of modern technology. But from the analysis made in this study so far, it can be seen that the policy has not been fully implemented to increase domestic production. Furthermore, the target set of achieving 370,000 metric tonnes production annually has not been realized yet.

#### **4. CONCLUSION**

The study has indicated that Ghana rice imports outweigh its domestic production level; with a production deficit of 492 thousand metric tonnes. It further showed that the per capita consumption of rice in Ghana increased from 29.10 kg in 2005 to 35.47 kg in 2014, as the population increased and its economic development improved. It also showed that Government expenditure on rice imports stand at 500 million USD, which represent a 259.87% increase from 2005. Also rice availability on the Ghanaian market is highly influenced by the economic situations (rice production, price changes, fuel price adjustment) that prevail on the global rice market.

The study further observed that Ghana has a well-defined rice sector policy, but the policy has not functioned fully to aid production of enough rice to substitute the rising demand for imported rice. It has also not been able to achieve its target of producing 370 thousand metric tonnes of rice annually.

It is concluded that Ghana is a net rice importer. The quantity of rice consumed depends largely on the economic, social and political situations in the major rice producing countries. This implies that in terms of rice consumption in Ghana, there is high food insecurity. Therefore, any decisions made by the leading rice exporting countries to ban or reduce the quantity of rice supply to Ghana may cause food shortage and hunger.

#### **5. RECOMMENDATIONS**

Based on the findings of the study, it is recommended that instead of increasing rice import tariff government should allocate a quota to rice imports in the country; this will help save government expenditure on rice imports. The money that would have been spent on imports should be invested into irrigations development and area expansion. Additional irrigation facilities should also be built in all the rice producing

zones, this will contribute to all year round rice production. Furthermore, rice areas need to be expanded to produce more rice through mechanized farming. Government should encourage commercial farming by assisting farmers with tractors, harrows, combine harvesters, planters etc.

The Ministry of Food and Agriculture should be partner with private institutions to purchase modern rice processing equipment to aid local rice production and processing. Increase in quantity should not only be the focus, because most consumers perceive the local rice to be of inferior quality as compare to the imported rice due to the poor processing. It is therefore necessary to improve the quality of the locally produced rice by employing modern equipment that is able to extract dust and stones from the rice. The packaging should also be improved to make it more attractive to consumers.

More attention should be given to research in the rice sector, most of the Ghanaian consumers like perfumed rice, it is therefore necessary for research to be conducted to develop rice varieties that meet consumer demand. Rice farmers in Ghana are peasant farmers who depend largely on the rainfall production. It would be necessary for rice varieties that are drought tolerant, higher yielding and a shorter fruit bearing period be developed to enable farmers produce throughout the year.

Government should introduce a special package in the rice sector in the form of money to support smallholder rice farmers and the youths who make show special interest in rice production. This will make the sector attractive to majority of youth. Free land can also be provided as a means to encourage the youths to participate in rice production. Agrochemicals such as fertilizers, pesticides, etc. can also be used to bait the youths into rice production. When this is executed well, more youths will be attracted to rice farming, which will help to reduce the growing number of old age farmer in rice farming. It will also help reduce the level of youth employment in the country and at the same time providing more food for the country.

Farmers should encourage their children to take agriculture as a profession by specializing in rice farming and also staying with them in rural areas and work on farms. This calls for government intervention by making life more comfortable in rural areas through holistic rural development,

such as provision of potable drinking water, electricity, good road and transport networks, quality healthcare system, education, communication and community service centres.

## DISCLAIMER

Some part of this manuscript was previously presented and published in the following conference.

Conference name: "10th Global Summit on Food Safety, Processing & Technology"  
Dates: December 05-07, 2016  
Location: San Antonio, USA  
Volume 2, Issue 4(Suppl)

Web Link of the proceeding:

<https://www.omicsonline.org/proceedings/high-rice-imports-as-a-threat-to-food-security-and-a-hindrance-to-sustainable-rice-production-in-ghana-58518.html>

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

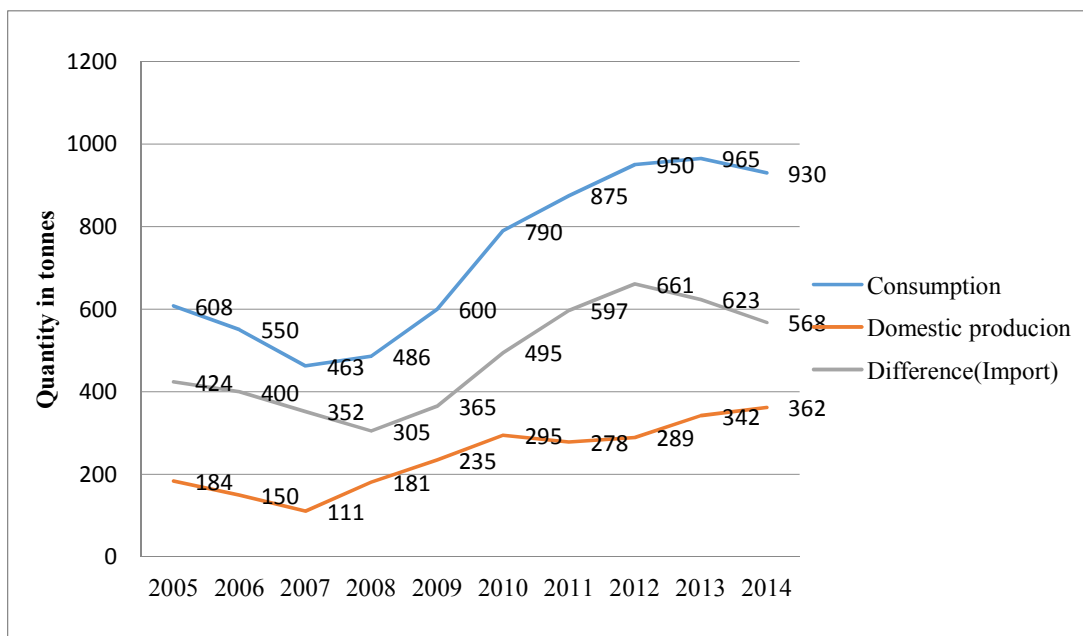
1. International Rice Research Institute. Rice Today: Trends in Global Rice Trade; 2015. Available: <http://irri.org/rice-today/trends-in-global-rice-trade> Accessed 10<sup>th</sup> October, 2016.
2. Muthayya S, Sugimoto JD, Montgomery S, Maberly GF. An overview of global rice production, supply, trade, and consumption. *Annals of the New York Academy of Sciences*. 2015;1324(0077):7-14. DOI: 10.1111/nyas.12540.
3. FAO. Rice Market Monitor (RMM). 2016;29(2). Available: <http://www.fao.org/economic/est/publications/rice-publications/rice-market-monitor-rmm/en/> Accessed 8<sup>th</sup> October, 2016.
4. FAO. Rice Market Monitor; Basic Foodstuffs Service, Commodities and Trade Division Food and Agriculture Organization of the United Nations; 2012. Available: <http://www.fao.org/es/ESC/en/ind ex.html> Accessed 8<sup>th</sup> October, 2016.
5. FAO. Africa experiencing an increasing demand for rice consumption. FAO Regional Office for Africa publication, Kenya; 2016. Available: <http://www.fao.org/africa/news/detail-news/en/c/430281/>. Accessed on 25<sup>th</sup> September, 2016.
6. MOFA. National Rice Development Strategy (NRDS) Draft. Ministry of Food and Agriculture; Accra, Ghana; 2009.
7. SWAC/OECD. West African Challenges. OECD publication. 2011;02. Available: <https://www.oecd.org/swac/publications/48356981.pdf>
8. Oladele O, Wakatsuki I. Learning alliances in sawah rice technology development and dissemination in Nigeria and Ghana. *Life Science Journal*. 2011;8(2):622-627. Available: <http://www.sciencepub.net/life> Accessed on 25<sup>th</sup> August, 2016.
9. Dogbevi KE. Ghana struggles to cut rice import. *Ghana Business News*; 2015. Available: <https://www.ghanabusinessnews.com/2015/10/01/ghana-struggles-to-cut-rice-imports/> Accessed on 30<sup>th</sup> August, 2016.
10. Index Mundi. Ghana Milled Rice Domestic Consumption by Year; Commodity; 2015. Available: <http://www.indexmundi.com/agriculture/?country=gh&commodity=milled-rice&graph=domestic-consumption> Accessed on 11<sup>th</sup> November, 2016.
11. Alhassan H, Frimpong T, Mohammed S.A. Do Ghanaian rural consumers prefer imported rice to local rice? Evidence from Akuapem North Municipality. *Applied Research Journal*. 2015;1(3):24-34. Available: [www.arj.presbyuniversity.edu.gh](http://www.arj.presbyuniversity.edu.gh) Accessed on 21<sup>th</sup> October, 2016.
12. Ghana News Agency. Ghana to Double Rice Production by 2018 Minister; 2015. Available: <http://www.ghananewsagency.org/economics/ghana-to-double-rice-production-by-2018-minister--95109> Accessed on 22<sup>nd</sup> September, 2016.
13. Ayisi ND, Kumi JA. Challenges and future prospects for broiler meat consumption in Ghana. *Imperial Journal of Interdisciplinary Research (IJIR)*. 2016;2(8):648-654.
14. Addy AH, Climate change vulnerabilities on food security in Ghana. *Modern Ghana Publications*; 2015. Available: <https://www.modernghana.com/news/654516/1/climate-change-vulnerabilitieson-food-security-in-.html> Accessed on 15<sup>th</sup> September, 2016.
15. Fader M, Gerten D, Krause M, Lucht W, Cramer W. Spatial decoupling of agricultural production and consumption:

- quantifying dependences of countries on food imports due to domestic land and water constraints. *Environmental*. 2013; 8(1):15.  
DOI:10.1088/1748-9326/8/1/014046
16. Quarshie HM, Lowland rice development project, tamale; Multi-agency partnerships for technical change in West African agriculture. National workshop on rice production in Ghana. Ho. 2000. Available:<https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/4130.pdf>  
Accessed on 13<sup>th</sup> August, 2016.
  17. Asuming-Brempong S. Comparative advantage and rice policy in Ghana. (Master's thesis) Faculty of The Graduate School, University of The Philippines, Los Banos; 1987.  
Available:[http://ugspace.ug.edu.gh/bitstream/handle/123456789/7219/Samuel%20AsumingBrempong\\_Comparative%20Advantage%20and%20Rice%20Policy%20in%20Ghana\\_1987.pdf?sequence=2](http://ugspace.ug.edu.gh/bitstream/handle/123456789/7219/Samuel%20AsumingBrempong_Comparative%20Advantage%20and%20Rice%20Policy%20in%20Ghana_1987.pdf?sequence=2)  
Accessed on 30<sup>th</sup> August, 2016.
  18. Bozza J. Development of rice production in Northern Ghana; in multi-agency partnerships for technical change in West African agriculture. National Workshop On Rice Production in Ghana. ODI Assets Publications.1994;4130.  
Available:<https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/4130.pdf>  
Accessed on 10<sup>th</sup> August, 2016.
  19. Tanko M. Effects of rice importation on the pricing of domestic rice in Northern region of Ghana. ABC Research house. 2015;3(2):23-26.
  20. FAO.How to feed the world in 2050. N.d. Available:[http://www.fao.org/fileadmin/templates/wsfs/docs/expert\\_paper/How to Feed the World in 2050.pdf](http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf).  
Accessed 15<sup>th</sup> October, 2016.
  21. Sakyi KA, Can Ghana ever have a sustainable agriculture; 2014.  
Available:<https://www.newsghana.com.gh/can-ghana-ever-have-a-sustainable-agriculture/>  
Accessed on 9<sup>th</sup> August, 2016.
  22. FAO. Rice Market Monitor; Basic Foodstuffs Service, Commodities and Trade Division Food and Agriculture Organization of the United Nations; 2006. Available:<http://www.fao.org/es/ESC/en/index.html>  
Accessed on 10<sup>th</sup> August, 2016.
  23. Centre for Policy Analysis. The energy crisis and growth performance of the economy: Selected economic issues. CEPA Issues Paper. 2007;15. ISSN:0855-7144.  
Available:<http://www.cepa.org.gh/research/papers/GSEI%20No.%2015%202007%20The%20Energy%20Crisis%20and%20Growth49.pdf>  
Accessed on 11<sup>th</sup> August, 2016.
  24. European Commission. Causes of the 2007-2008 global food crisis identified. Science for environment policy: European Commission DG Environment News Alert Service. 2011;225.
  25. Cudjoe G, Breisinger C, Diao X. Local impacts of a global crisis: Food price transmission and poverty impacts in Ghana. Paper presented at the 27th IAAE Conference, Beijing, China; 2009. Available:<http://ageconsearch.umn.edu/bitstream/51089/2/Local%20impacts%20of%20a%20global%20crisis%20Cudjoe%20et%20al..pdf>  
Accessed on 22<sup>nd</sup> August, 2016.
  26. MOFA. Facts and figures (2012). Ministry of Food and Agriculture; Statistics, Research and Information Directorate. Accra; 2013.
  27. FAOSTAT. Imports/Exports Commodities by Country; 2015.  
Available:<http://www.faostat.org>  
Accessed on 4<sup>th</sup> September, 2016.
  28. Zhou M. Lift of Export ban in vietnam could ease rice prices. Market watch Publication; 2008  
Available:<http://www.marketwatch.com/story/lift-of-export-ban-in-vietnam-could-ease-rice-prices>  
Accessed on 20<sup>th</sup> October, 2016.
  29. Food Security Ghana. Rice in Ghana and The FAO Blunder; 2011.  
Available:<http://www.peacefmonline.com/pages/comment/features/201108/65490.php>  
Accessed on 20<sup>th</sup> August, 2016.
  30. Amanor-Boadu V. Rice price trends in Ghana (2006–2011). METSS-Ghana Research and Issue Paper Series No. Accra, Ghana: Monitoring, Evaluation and Technical Support Services (METSS), United States Agency for International Development (USAID). 2012;02(2012).
  31. FAO. Food Security. Policy Briefing; Agriculture and Development Economics Division (ESA), Rome. 2012;2.

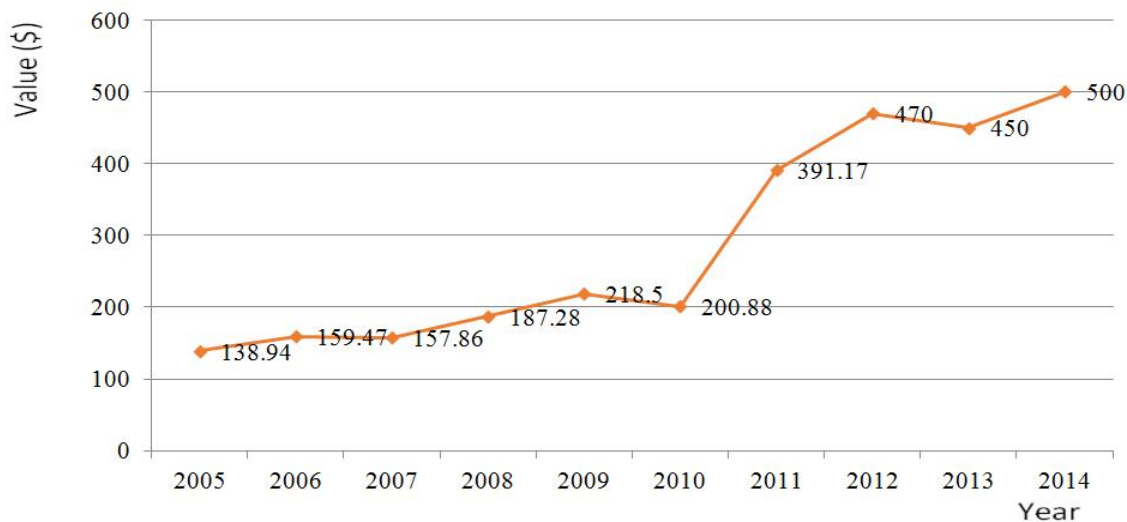
32. ISSER. Overview: Global economic developments and Ghana's economic performance; 2014.  
Available: [http://isser.edu.gh/images/Publication\\_files/SGER2014\\_Overview.pdf](http://isser.edu.gh/images/Publication_files/SGER2014_Overview.pdf)  
Accessed on 20<sup>th</sup> August, 2016.
33. Kwofi C. Ban on Inland rice imports not effective; 2015.  
Available: <http://www.graphic.com.gh/business/business-news/ban-on-inland-rice-imports-not-effective.html>  
Accessed on 24<sup>th</sup> September, 2016.
34. Mugisha R. Is a high dependency on food imports really a problem? A discussion food security. Researchgate; 2015.  
Available: [https://www.researchgate.net/post/Is\\_a\\_high\\_dependency\\_on\\_food\\_imports\\_really\\_a\\_problem](https://www.researchgate.net/post/Is_a_high_dependency_on_food_imports_really_a_problem)  
Accessed on 15<sup>th</sup> August, 2016.
35. Toni A. Is a high dependency on food imports really a problem? A discussion on food security. Researchgate; 2015.  
Available: [https://www.researchgate.net/post/Is\\_a\\_high\\_dependency\\_on\\_food\\_imports\\_really\\_a\\_problem](https://www.researchgate.net/post/Is_a_high_dependency_on_food_imports_really_a_problem)
36. Baumeister C, Kilian L. Do oil price increases cause higher food prices? Working paper. University of Michigan; 2013.
37. FAO. The 2007-08 Rice Price Crisis. Policy Brief 13; 2011.  
Available: <http://www.fao.org/docrep/013/am172e/am172e00.pdf> Accessed on 20<sup>th</sup> August, 2016.
38. FAO. The state of food and agriculture 1995. FAO Agriculture Series Rome Italy. 1995;28(92):5-103700.
39. Chen HA. Literature review on the relationship between foreign trade and economic growth, International Journal of Economics and Finance. 2009;1(1):27-30.
40. IMF. Staff Country Report. Mali selected issue. 2006;06(088).  
Available: [https://books.google.com.gh/books?id=IjB8FZnWEewC&pg=PA10&lpg=PA10&dq=petroleum+price+increase+affect+food+prices+and+consumption+in+ghana&source=bl&ots=XdFzj\\_ZIV0&sig=w4DTU4FcCYp9czoyKM\\_PkjGOfBc&hl=en&sa=X&ved=0ahUKewiQ\\_MnZ9nOAhUDDJoKHR4GBYoQ6AEIMDAE#v=onepage&q=petroleum%20price%20increase%20affect%20food%20prices%20and%20consumption%20in%20ghana&f=false](https://books.google.com.gh/books?id=IjB8FZnWEewC&pg=PA10&lpg=PA10&dq=petroleum+price+increase+affect+food+prices+and+consumption+in+ghana&source=bl&ots=XdFzj_ZIV0&sig=w4DTU4FcCYp9czoyKM_PkjGOfBc&hl=en&sa=X&ved=0ahUKewiQ_MnZ9nOAhUDDJoKHR4GBYoQ6AEIMDAE#v=onepage&q=petroleum%20price%20increase%20affect%20food%20prices%20and%20consumption%20in%20ghana&f=false)  
Accessed on 23<sup>th</sup> August, 2016.
41. Childs N, Kiawu J. Factors behind the rise in global rice prices in 2008', Economic Research Service Report RCS-09D-01, US Department of Agriculture, Washington DC; 2009.
42. Kwakye JK. Genesis and Solutions to Ghana's Current Economic Crisis. Graphic Publications No. May, 2014.  
Available: <http://www.graphic.com.gh/news/politics/genesis-and-solutions-to-ghana-s-current-economic-crisis.html>. accessed on 15/08/2016  
Accessed on 20<sup>th</sup> August, 2016.

**APPENDIX**

ISSER: Institute of Statistical, Social and Economic Research



**Fig. 1a. Domestic rice production and imports trend in Ghana**



**Fig. 2a. Ghana's expenditure on rice import (in USD)**

© 2017 Ayisi and Kassai; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
 The peer review history for this paper can be accessed here:  
<http://sciencedomain.org/review-history/18841>