

STUDY OF THE IMPACT OF NIGERIA'S RICE IMPORT RESTRICTIONS

EDITED REVISED REPORT

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Table of Contents

EXECUTIVE SUMMARY	iiv
1. Introduction.....	1
1.1 Preamble	1
1.2: Terms of Reference.....	1
1.3: Study objectives – Interpretation of the ToR.....	3
1.4: Structure of the Report.....	4
2. Theoretical Framework and Methodology.....	5
2.1. Theoretical Framework.....	5
2.2. Methodology	10
2.3. Variables Measurements and Sources of Data.....	16
3. Structure of the Rice Industry	17
3.1 Definition of Rice and Types of Rice	17
3.2: Global and National Value Chain.....	18
3.3: Structure of the Global Rice Industry	22
3.4: Structure of the Nigerian Rice Industry.....	23
4. Rice Industry Policy Environment.....	26
4.1 Global Policy Environment.....	26
4.2: Policy Environment in Nigeria.....	31
5. Rice Industry Performance	36
5.1: Performance of Rice Industry: Global	36
5.2: Performance of Rice Industry: Developing Countries.....	38
5.3: Performance of Rice Industry: The Case of Nigeria.....	39
6. Rice Import Prohibition Policy	43
6.1. Import Regulation and Waiver.....	43

6.2 Operational Modalities.....	44
6.3. Implementation Experience	44
7. Comprehensive Quantification of the Total Economic Benefits and Costs of Rice Industry Protection	45
7.1: Introduction.....	45
7.2. Economic Benefits	46
7.3. Economic Costs	48
7.4. Benefit and Cost Comparison: The Deadweight Loss from Protection.....	49
8. Impact of Rice Import Restrictions on the Food Processing Industry	51
8.1: Introduction.....	51
8.2: Impact of Rice Price on Food processing Industry Output.....	52
8.3. Impact of Rice Price on Food processing Industry Employment	52
9. Evaluation of the External Effects of Rice Protection	53
9.1 Introduction	53
9.2 Corporate Social Responsibility.....	54
10. Comprehensive Quantification of the Value of Rice Waivers Granted.....	56
10.1 Introduction.....	56
10.2. Quantification of Waivers.....	56
11. Quantification of the Potential Benefits of Tariffication as an Alternative Measure to Import Prohibition.....	57
12. Conclusion and Recommendations	59
12.1. Introduction.....	59
12.2. Conclusion	59
12.3 Recommendations	61
References	62
Appendices.....	64

EXECUTIVE SUMMARY

I. Introduction

This study focuses on the determination of the impact of Nigeria's rice import restriction; in particular, with regard to the costs and benefits to industry stakeholders. Specifically, the study describes the structure, policy, and performance of the Nigerian rice industry. A comprehensive analysis of the context, operation modalities and implementation issues of rice import prohibition policy, and a comprehensive quantification of the total economic benefits and costs of protection were undertaken. Also, the impact of rice import restrictions on the Nigerian food processing industry's output and employment was determined and analyzed. Finally, the study concerns itself with an evaluation of the external effects of protection, the costs and benefits quantification of the value of waivers as well as issues relating to tariffication as an alternative measure to import prohibitions in the rice industry.

II. Findings

The following are the major findings:

a) Structure, Policy and Performance of the Nigerian Rice Industry

- Rice is cultivated in virtually all of Nigeria's agro- ecological zones with the North Central zone leading with about 44percent of rice output. The North West follows with 29 percent, while the North East, South East, South West and South-South account for 14, 6, 4, and 3 percent, respectively.
- Main rice production inputs are seeds, agro-chemicals, irrigation, machinery and equipment, and land. Beyond the primary production stage is the processing stage; inserted, because the "production stage" is also associated with the generation of value added. Combination of main raw material (paddy rice) with other intermediate

inputs like milling machines produces different finished rice products as parboiled rice, co-products, by-products, and wastes.

- Rice policies have taken two forms, namely, production support policies and trade-related policies. Indeed, various policies have been embarked upon to manage the production, consumption, importation and exportation of rice.
- Rice policy environment in Nigeria has witnessed three significant eras, namely, pre-ban (1971-1985), ban (1986-1995), and post ban (1996-Date). The central thesis of the policy intent has remained largely on the need to protect the domestic rice industry from influx of rice importation.
- The ban period (1986-1995) was characterized by low tariffs combined with prohibition while the post ban period has high tariffs with prohibition.
- The performance of Nigerian rice industry essentially reflects the broad characterization of the industry in some developing countries and Africa in particular. Production of rice is found to be trailing behind domestic consumption. Also, Nigeria's presence in international trade for rice is lopsided in favour of rice importation. Rice export in Nigeria has been insignificant, while Nigeria has recently become the second largest importer of rice in the world.

b) Rice Promotional Policies

- Beyond the employment of various trade policy measures, the Federal government in Nigeria embarked on some policies meant to directly influence the Nigerian rice industry. Three notable initiatives are: Presidential Initiative on Increased Rice Production, Processing and Export with the over-arching objective being to enhance household food security and income, eliminate imports and generate exportable surpluses; the National Food Reserve Agency (NFRA) with the mandate to increase national rice supply by enhancing national processing capacity, and agricultural transformation agenda that housed the rice transformation agenda of the President Goodluck Jonathan's administration. The rice transformation agenda has as its objective self sufficiency in rice production and complete substitution of imported rice by year 2014.

c) Operations of Rice Import Restrictions and Waivers

- Import regulatory power has been frequently and generously invoked since the early 1980s benefitting private companies prior to the emergence of the Nigerian National Supply Company (NNSC) in the mid 80's as the sole importer of rice. Sequel to the re-entry of private importers into the rice importation business and eventual disbandment of NNSC as part of the deregulation policy under Nigeria's structural adjustment programme, rice has fully become the pre-occupation of the private sector.
- The operations of restrictions on rice and waivers have been subjected to both external and internal criticism. Virtually every WTO Trade Policy Review of Nigeria has pointed at rice import restrictions as violation of Nigeria's commitment to various trade agreements signed by the country. In addition, the process of granting import prohibition waivers has been criticised for being opaque, secret, discriminatory and liable to corruption.

d) Total Economic Benefits and Costs of Rice Import Restrictions

- Economic benefits and costs vary across the three import restriction regimes and across the two competition levels. On aggregate, under the tariffs-only import regime economic benefits on annual average amounted to ₦ 0.06 billion on paddy/brown rice and ₦ 0.056 billion on milled/parboiled rice while the economic costs on annual average stood at ₦0.063 billion on paddy rice and ₦0.062 billion on milled/parboiled rice.
- Net welfare loss or deadweight burden of ₦ 0.002 billion on paddy and ₦ 0.006 billion on milled/parboiled rice per annum was recorded under the tariffs only regime.
- For the low tariffs plus prohibition import regime, a benefit-cost value of ₦3.58 billion per annum on paddy and ₦ 0.80 billion on milled/parboiled rice was recorded,

while the regime of high tariffs that is combined with import prohibition generated aggregate deadweight loss of ₦ 12.28 billion on paddy and ₦ 15.04 billion on milled/parboiled rice.

- Net welfare loss increases with combination of tariffs with import prohibition as trade barriers distort both consumption and production. This deadweight loss arises because the trade barriers induce inefficient domestic high-cost production (i.e. domestic production at a resource cost higher than the cost of importing rice from abroad) and the consumption distortion arises because the trade barriers reduce domestic rice consumption below the Pareto-optimal free-trade level.
- Inefficiency costs or dead-weight losses are higher under both the low and high tariffs plus prohibition regimes than with the tariffs-only import restriction regime. In all the regimes, the consumer loss is much larger than the production loss. Also, distortion on imported brown (husked) rice is larger than the distortion that is created on imported parboiled rice.
- With hike in the price of rice during the 2004 – 2010 period, estimated average annual output loss in food producing industry was ₦71,991.53 million (73.06% of actual output) arising from higher costs implication of protection witnessed in this period.
- Rice price increases also resulted in large employment losses in the food processing industry such that about 116,185 jobs were lost by the industry on yearly basis between 2004-2010 period.

e) External Effects of Rice Production

- Health and environmental status of communities hosting rice farms and rice milling industries is always negatively affected. No evidence is found to suggest that rice milling firms focus their corporate social responsibility initiatives in the direction of the forms of negative externalities they induce with their activities.

f) Quantification of Waivers

- Importers of brown rice enjoyed a “rent” per ton rising from ~~₦~~40 in 1970-1985, through ~~₦~~3,907 in 1986-1995, to ~~₦~~6,150 in 1996-2010. These rents ranged from 12.72% of domestic price during 1996-2010 to 57.78% during 1970-1985.
- With respect to parboiled rice, the importers gained “rents” of ~~₦~~94 per ton during 1970-1985, and ~~₦~~10,422 per ton during 1996-2010. However, a subsidy prevailed to the tune of ~~₦~~1,349 per ton during 1996-2010.

g) Potential benefits of Tariffication as alternative measure

- The estimated average tariff equivalence of brown rice is 96% and 124% on parboiled rice. If this tariff equivalent rate had been applied instead of the import prohibition regime, the same level of protection would have been enjoyed by domestic rice producers and inefficiency associated with prohibition eliminated.

III. Recommendations

Based on the quantitative evidence generated by this report and summarized above, it is recommended that:

- Given the importance of rice industry in Nigeria, the various necessary government supports to the industry must be properly fine-tuned. This is germane in order to eliminate likely negative consequences that such policy interventions may transfer to the people and forward linkage industry like food processing.
- Import restriction, whether in the form of high import duties or through import prohibition, can hardly be adjudged as appropriate policy instrument for promoting domestic production of rice.

- Food security requires that adequate food be available to all at affordable price. Since import restriction inevitably leads to high prices and reduced supply and consumption which, in turn, result in consumer welfare loss, the use of import restrictions is bound to either frustrate the achievement of food security or at least be in conflict with it.
- Government needs to focus more on supply-enhancing policy initiatives in favour of local production. Production barriers limiting large scale production of rice as well as milling capacity of domestic rice mills should be confronted by appropriate policies.

STUDY OF THE IMPACT OF NIGERIA'S RICE IMPORT RESTRICTIONS

1. Introduction

1.1 Preamble

The Nigerian rice sector has experienced some remarkable developments, particularly in the last decade. Both production and consumption of rice in Nigeria have vastly increased during the period. The demand for rice in Nigeria is, however, growing faster than for any other major staple, with consumption broadening across all socio-economic classes, including the poor. Recent statistics reveal that Nigerians consume about 5.4 million metric tons of rice annually (valued at \$9.2 billion at current prices), while local production only amounts to about 2.3 million metric tons per year. The remaining 3.1 million metric tons is imported, making Nigeria the second largest importer of rice in the world.

In order to reduce the dependence on imported rice as well as develop the local rice industry, the Government of Nigeria has experimented with a wide range of policy initiatives since the early 1970s. A recurrent part of these has been the use of various forms of rice import restrictions. These experiments have generally not been preceded by - or subsequently been evaluated on the basis of - appropriate quantitative analysis of their impact on local rice production (output, employment), on rice consumers (price), on government revenue, as well as on the economy. This is the rationale for this study.

1.2: Terms of Reference

The key activities outlined below, which are categorized in terms of outputs, form the nucleus of the Terms of Reference (TOR) for the project.

Output 1 Activities

The activities of output 1 are:

1. Desk review of available studies, data and research on the Nigerian rice industry;
2. Consultations with identified stakeholders;
3. Conduct of key research and analysis, particularly focusing on:
 - Comprehensive analysis of the operation of the prohibitions, including
 - Full record of waivers granted if available
 - Comprehensive quantification of the total economic benefits, i.e. the value of the protection for the domestic rice industry, ideally separating the value accruing to capital holders (owners) and the added value accruing to workers (including job creation/job security).
 - Comprehensive quantification of the total economic costs to Nigeria's economy associated with the import restriction, including
 - Direct price gap losses to consumers
 - Effects on the domestic rice value chain (e.g. milling)
 - Medium-/long-term inefficiencies
 - Comprehensive evaluation of the social benefits and costs of the protection (including assessment of impact on employment and poverty).
 - Comprehensive quantification of the value of waivers granted (costs and benefits).
 - Quantification of the potential benefits of tariffication as an alternative measure to import prohibitions.

4. Writing of draft final report.

Output 2 Activities

The activities of output 2 are:

1. Presentation of the draft final report to DFID Nigeria and other invited stakeholders in Abuja/Lagos. The presentation will include a summary of key findings, recommendations and possible follow-up actions for discussion.

Output 3 Activities

The activities of output 3 are:

1. Revisions on the draft final report based on the feedback and comments from the external peer review, and from DFID, Saana other key stakeholders.
2. Completion of final report based on feedback on draft report.

1.3: Study objectives – Interpretation of the ToR

The main objective of the study is to analyse the impact of the import restriction imposed on rice by the Nigerian government on the key stakeholders in the economy. In specific terms, the study seeks to:

- i. Conduct a comprehensive analysis of the operation of import restrictions of rice, including full record of waivers granted, if available;
- ii. Quantify in a comprehensive way the total economic benefits of import restrictions in the rice sector through the analysis of the value of the protection for the sector by type of stakeholders (producers, workers, consumers);
- iii. Perform a comprehensive quantification of the total economic costs of import prohibition in the rice sector to Nigeria's economy associated by analyzing the direct price gap losses to consumers, the impact on the Nigerian domestic producers with particular emphasis on

costs, growth of the sector and value chain creation as well as induced medium to long-term inefficiencies;

- iv. Carry out a comprehensive evaluation of the social benefits and costs of the protection of the rice sector;
- v. Provide a comprehensive quantification of the value of waivers granted in terms of their costs and benefits; and
- vi. Quantify the potential benefits of tariffication as an alternative measure to import prohibitions.

1.4: Structure of the Report

This Report contains twelve sections in all, including this introductory section. The study's theoretical framework and methodology are presented in section 2. Sections 3, 4 and 5 constitute the background to the study. More specifically, section 3 discusses the structure of the rice industry, using the value chain approach, and in the context of global, developing – country, as well as Nigerian perspectives. The policy environment of the rice industry is discussed in the same context, in section 4. In section 5, the study's background is completed with an analysis of rice industry performance.

The study's major deliverables are the comprehensive analysis and quantification of various aspects of the impact of rice import restrictions. These are presented in sections 6 – 11. Thus, section 6 describes the rice import prohibition policy, section 7 focuses on economic benefits and costs, while sections 8 and 9 address the impact of rice import restrictions on food processing and evaluation of external effects respectively. Section 10 quantifies rice import waivers. Section 11 treats the tariffication of rice import prohibition. The study's conclusion and recommendations are presented in section 12.

2. Theoretical Framework and Methodology

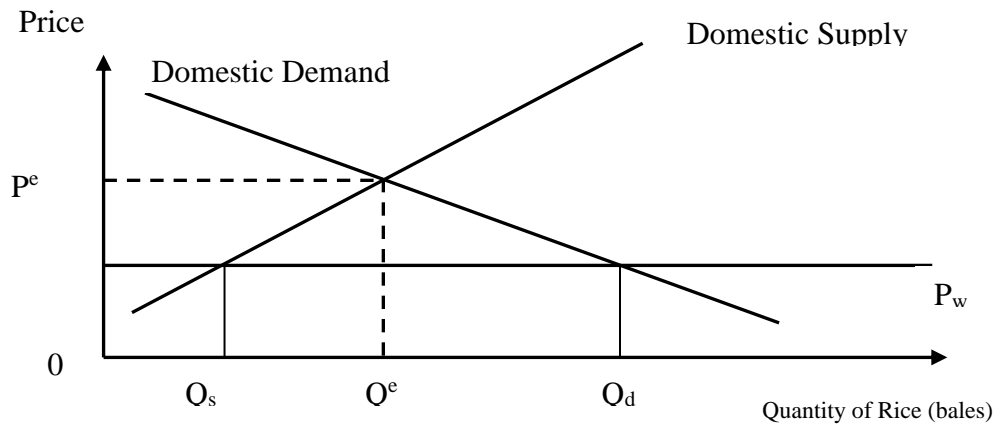
This section develops the theoretical framework on which the computation of the impact of the rice import restrictions on the Nigerian economy is based. It also discusses how the computations are carried out. The first part deals with the impact of rice import restrictions on domestic producers of rice, the government, and the consumers of the product in terms of what each of the stakeholders gain or lose from the policy. In discussing how the computations were carried out, the section describes, sometimes in algebraic form, the formulae for the calculations and relationships between the variables of interest. In particular, the price elasticity of demand and supply which are used in the equations as well as the results to expect in terms of when a change in one variable causes the other to respond positively or negatively are discussed.

2.1. Theoretical Framework

2.1.1. Cost and Benefit of Restrictions

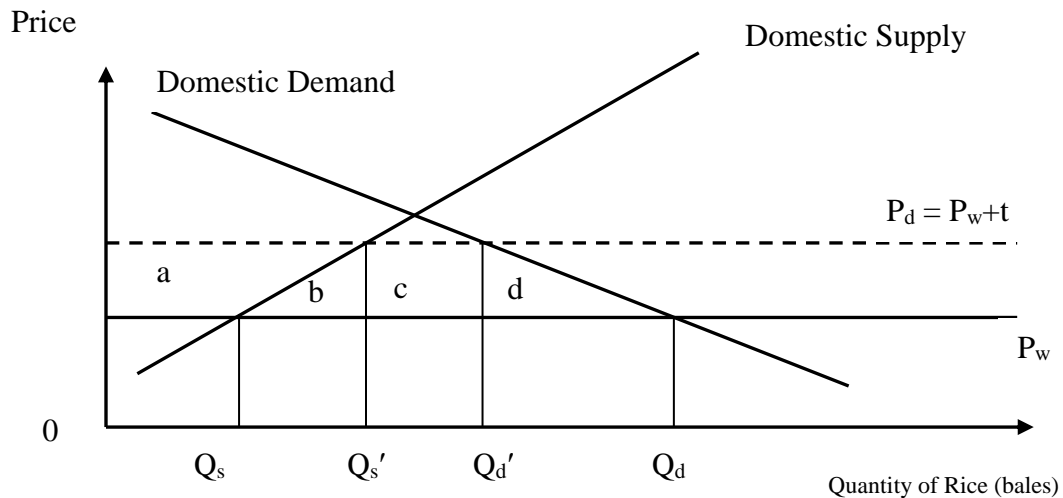
Import regulation, which can be in form of tariffs or non-tariff (e.g. quota and outright ban) is discussed using Figures 2.1, 2.2 and 2.3. Figure 2.1 compares the domestic market equilibrium for rice in the presence of a complete import ban with free trade equilibrium. If rice imports are prohibited, the market clearing price is P^e and the quantity demanded and supplied by domestic producers is Q_e . In contrast, assuming that the import supply of rice is perfectly elastic at a world market price $P_w < P^e$, the quantity produced domestically would be Q_s , the quantity demanded would be Q_d and the amount $Q_d - Q_s$ would have been imported if importation was allowed. Figure 2.2 compares the free trade equilibrium with the situation in the presence of a tariff on rice imports. When there is no tariff imposed, domestic market and world market prices are the same at the point of entry (P_w), assuming no transport cost.

Figure 2.1: Domestic Market for Rice - No Import Model



In other words, the domestic price of Rice is determined by the world market price, and in reality, only transaction costs such as the costs of transport account for any difference. However, if a tariff is imposed on the importation of rice, the tariff has the effect of increasing domestic prices to $P_d = P_w + t$. This increase in domestic price of rice has consequences, first on quantity demanded and supplied and quantity imported, and second on consumers, producers and the government, as well as the economy as a whole.

Figure 2.2: Domestic Market for Rice – Import with Tariff Model



First, the graph shows that at the free trade, world price of rice (P_w), the quantity of rice demanded by Nigerians is greater than the domestic quantity supplied by the amount $Q_d - Q_s$ which is the amount of rice imported at the free trade price by Nigeria. The imposition of the tariff reduces quantity demanded to Q_d' from Q_d and increases domestic supply to Q_s' from Q_s . The import quantity of rice therefore shrinks to $Q_d' - Q_s'$.

Second, domestic producers of rice gain the area a , because the protection allows them to earn more per unit sold (the difference between the now increased domestic price and the world market price), and induces them to sell more units domestically (because at the higher price, additional production becomes profitable). This gain is referred to as the increase in “producer surplus.”

Third, consumers of rice lose area $a+b+c+d$ because (i) they now have to pay more per unit bought, (the difference between the now increased domestic price of a bag of rice and the world market price they would have paid otherwise); and (ii) they now consume less because they can afford less units of rice at the new price compared to the quantity they would have been able to afford at the lower world market price. This loss is referred to as a decrease in the “consumer surplus.” Usually, the net loss in “consumer surplus” for domestic consumers is significantly higher than the gain in “producer surplus” accruing to domestic producers. That is, only a part of the additional money consumers pay will actually benefit the producers (and their workers).

Fourth, the government gains the revenue from the tariff on rice, i.e. area c , and this accounts for part of the difference between the loss in consumer surplus and gain in producer surplus. In case of a quota, this becomes a quota “rent” for the imported quantities which is collected by the quota holders. The government earns the tariff income, of course, only on those

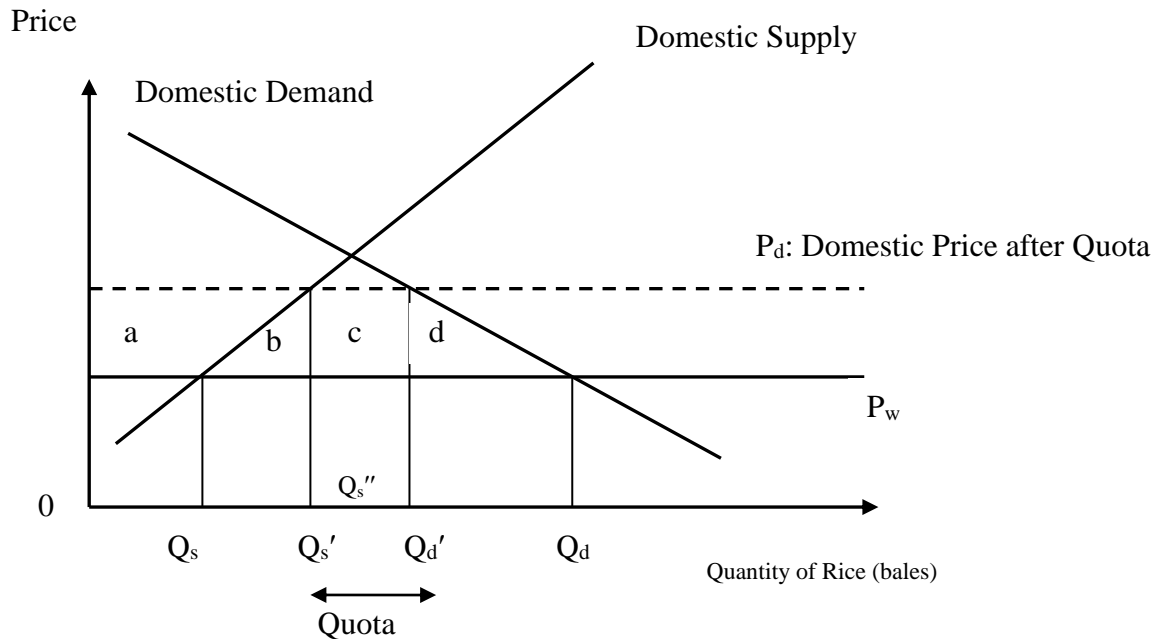
products that are actually imported. Since at the higher price, fewer products are consumed (domestically produced and imported combined), the combined benefit for producers (additional “producer surplus”) and the government (tariff revenue) is still less than what consumers lose. Thus, there is an efficiency loss that is a net loss to the economy. This is almost always borne in largest part by the domestic economy of the importing country itself especially when the importing country is a small country relative to the world. This is the area d .

Another net loss is the difference between the additional price which consumers have to pay for the additional share of the domestic market of the product now captured by domestic producers, and the “producer surplus” that accrues to domestic producers for this part of their domestic sales. This is the area b . These two net losses $b + d$ are, “deadweight” losses caused by the trade barrier and are not appropriated as a benefit by any economic agent in the economy. In other words, the net welfare or efficiency loss of distorting incentives to producers and consumers is consumer loss minus producer gain minus government gain $(a+b+c+d) - a - c = b+d$ where “ b ” is “production distortion loss” and “ d ” is “consumption distortion loss”. It is the net welfare loss of import restriction that is indeed borne by the importing country consumers including *business consumers*, e.g. food processing companies, who require the product as input to their production.

Figure 2.3 depicts the case of a quota instead of a tariff. In free trade, the import volume is $Q_d - Q_s$. In the case of the restriction on imports, $Q_d' - Q_s'$ is imported and price increases to P_d with the difference between the world price and the domestic price now being referred to as “tariff equivalent quota rent”. Quota rents constitute the difference between analysis in Figure 2.2 and 2.3 where instead for the government to earn revenue of the area “ c ”, it is now earned by

those who are licensed to import rice as “quota or economic rent”. But if the government auctions the licence to import, then it earns the area “c”.

Figure 2.3: Domestic Market for Rice – Import with Quota Model



2.1.2. Impact of Rice prices on the food processing Industry

In economics, the analysis of cost begins with the production function. The production function is a statement of the relationship between firm’s scarce resources (i.e. its inputs) and the output that results from the use of these resources.

In mathematical terms, the production function can be generally expressed as:

$$Q = f(x_i) \quad , \quad (1)$$

where Q denotes the quantity of output, x_i is the quantity of input i used in the production process ($i = 1, 2, \dots, n$) and n is the number of inputs.

This relationship between inputs and output is assumed to exist for a specific period of time. In other words, Q is not a measure of accumulated output over time. A change in production technology will cause the relationship between given inputs and output to change.

In moving from production theory to cost functions, we need to further assume that the firm acts as a “price taker” in the input markets, that is, it can use as many or as few inputs as it desires, as long as it pays the going market price for them and the input quantities purchased do not affect input prices. Therefore, the general cost function can be stated as:

$$C = \sum_{i=1}^n p_i x_i(Q, p) = C(Q, p) \quad (2)$$

where p_i is the price of input i and $x_i(Q, p)$ is the input demand function for input i implied by cost-minimizing behaviour.

Notice that it is the derivative of costs with respect to input prices (p) which equals input demands. To determine marginal costs, we would differentiate equation (2) with respect to output which yields:

$$MC = \frac{\partial C(Q, p)}{\partial Q} \quad (3)$$

In the rice industry, we would analyse the forward effect of the price change on the food processing sub-sector.

2.2. Methodology

The empirical measurement of the benefits and costs of protection basically involves the determination of the elasticities of demand and supply for the commodity of interest. These elasticities, alongside other variables, are then used to calibrate the relevant benefits and costs.

2.2.1: Computation of Economic Costs and Benefits and Associated Demand and Supply Elasticities

Following Lopez and Pagoulatos (1994), Kohler (2005) and Obih et al (2008), the domestic demand and supply are respectively expressed as decreasing and increasing functions of price as given in equations (4) and (5) below;

$$Q^d = \alpha P^{-\varepsilon} \quad (4)$$

$$Q^s = \beta P^\eta \quad (5)$$

Where Q^d is the quantity of rice consumed domestically, Q^s is the quantity of rice produced domestically, P is the domestic manufacturers' price, α and β are constants while ε and η are the absolute values of the elasticities of demand and supply respectively. When the above demand and supply functions are linearised, they give equations (6) and (7) with the estimates of the elasticities obtained using econometric estimations (see Das, 2004; Obih et al, 2008):

$$\log Q^d = \log \alpha - \varepsilon \log P + e_t \quad (6)$$

$$\log Q^s = \log \beta + \eta \log P + e_t \quad (7)$$

Given that P_w and P_d are the world and Nigerian prices of rice respectively, the ratio of these prices can be given as:

$$\theta = P_w/P_d = 1/(1+T) \quad (8)$$

Also, the domestic consumption expenditure for rice can be expressed in the form

$$E_c = VD + VM (1+T) \quad (9)$$

Where T stands for either or both of the ad valorem tariff rate (t^s) and the tariff equivalent of the corresponding non-tariff barrier, e.g. import quota (t^q). E_c is expenditure on rice, VD is the value of domestically produced rice and VM is the value of imported rice. Using equations (4) to (9), the costs and benefits of protection are derived and given as:

$$\text{i. Consumer loss (area a+b+c+d)} \quad CL = E_c (1 - \theta) \frac{(\theta^{-\varepsilon} + 1)}{2} \quad (10)$$

$$\text{ii. Consumption distortion loss (area d)} \quad CDL = \frac{CL(\theta^{-\varepsilon} - 1)}{(\theta^{-\varepsilon} + 1)} \quad (11)$$

$$\text{iii. Production distortion loss (area b)} \quad PDL = 0.5 \times VD \times T \times \theta (1 - \theta^\eta) \quad (12)$$

$$\text{iv. Producer gain (area a)} \quad PG = (VD \times T \times \theta) - PDL \quad (13)$$

$$\text{v. Government gain/quota rents (area c)} \quad GG = CL - (CDL + PDL + PG) \quad (14)$$

2.2.2: Computation of the Tariff Equivalent of Non-Tariff Barrier

It should be noted that it is easier to measure the benefits and costs of tariff protection than those of non-tariff protection. While information on tariff rate is readily available to compute the former, in the case of the latter, one has to find the tariff equivalent of the non-tariff barrier (NTBs), that is, the level of tariff that has the same effect on imports as the enforcement of the non-tariff barrier. The common practice is to use the difference between the internal farm price and the CIF import price of the commodity (See Deardorff, 1997; Linkins and Arce, 2002 and Moshini and Meilke, 1991). Therefore, the implicit tariff present in a quota can be expressed as;

$$t^q = \frac{P_d - P_w}{P_w} - t^g \quad (15)$$

Where t^q is the implicit tariff (tariff equivalent of NTBs), P_d is the domestic farm price of rice, P_w is the CIF calculated import price of rice and t^g is the usual level of tariff protection for rice in Nigeria. Equation (15) implies that the difference between domestic and international prices of rice is accounted for by the incidence of tariff and non-tariff barrier. Thus, t^q is a catch-all indicator for all other protection factors, apart from tariff, that may prevent the local price to equalise the world price of rice.

2.2.3: Estimation of Cost and Output Functions

The analysis of the underlying technology of an industry's production process is crucial to determining how it is affected in terms of costs, growth and employment. In this type of analysis, there is the option of examining either the production function or the associated cost (or profit) function. Following from the duality theory, it is possible to obtain the underlying production function parameters from the cost or profit function. In other words, all the information about the underlying technology is contained in both functions (See Shepherd, 1970 and Diewert, 1974). However, it has been shown that the cost or profit (dual) approach is superior for analytical purposes. Unlike the production function, the approach does not assume that inputs are exogenous. The dual approach takes inputs as endogenous variables that depend on prices and other exogenous variables. This is consistent with economic theory that having observed the prices of inputs, firms choose their inputs and outputs to maximise profit, or, for a given output, minimise cost (Nadiri, 1993).

Hence, the cost function and profit function are used in this study to model the impact of rice prices on Nigeria's food processing industry. The flexibility of the functional form that these functions may take has also been given important consideration in the literature. Many empirical studies usually resort to the translog function which could be considered as a second-order Taylor's series approximation in logarithms to an arbitrary cost function (See Christensen et al., 1973). This functional form imposes no *a priori* restriction on the production structure and this makes it possible to test alternative production formulations (See Banda and Verdugo, 2007).

(i) The translog cost function

The translog cost function can be specified as:

$$\ln C = \alpha_0 + \sum_{i=1}^N \alpha_i \ln P_i + \frac{1}{2} \sum_{i=1}^N \sum_{j=1}^N \alpha_{i,j} \ln P_i \ln P_j + \alpha_y \ln Y + \frac{1}{2} \alpha_{y,y} (\ln Y)^2 + \sum_{i=1}^N \alpha_{i,y} \ln P_i \ln Y \quad (16)$$

where $i, j = L, \dots, N$ index the N different inputs considered and $\alpha_{ij} = \alpha_{ji}$, C is total cost, Y is output and the P_i 's are the prices of the factor inputs.

Using labour, capital and rice as the primary inputs in the food processing industry, equation (16) can be expanded to give:

$$\begin{aligned} \ln C = & \alpha_0 + \alpha_l \ln P_l + \alpha_k \ln P_k + \alpha_c \ln P_c + \alpha_{l,k} \ln P_l \ln P_k + \alpha_{l,c} \ln P_l \ln P_c + \alpha_{k,c} \ln P_k \ln P_c \\ & + \frac{1}{2} \alpha_{l,l} (\ln P_l)^2 + \frac{1}{2} \alpha_{k,k} (\ln P_k)^2 + \frac{1}{2} \alpha_{c,c} (\ln P_c)^2 + \alpha_y \ln Y + \frac{1}{2} \alpha_{y,y} (\ln Y)^2 \\ & + \alpha_{l,y} \ln P_l \ln Y + \alpha_{k,y} \ln P_k \ln Y + \alpha_{c,y} \ln P_c \ln Y + \epsilon \end{aligned} \quad (17)$$

Where C is cost, Y is output and P_l , P_k and P_c represent the prices of labour, capital and rice respectively. Output (Y) is measured as the value added deflated with the price deflator of the food processing industry. Cost is total cost per unit of product and this is measured as the direct contract cost of food processing divided by the estimated output level. P_l is obtained by dividing total staff cost by the numbers of employees, P_k is computed as the gross rate of return paid to capital (addition of income attributable to capital input and deprecation divided by total asset) and P_c is the firm-gate price of rice, assuming food processing industries buy directly from the farm.

Some important parameters can be computed from equation (17). The relevant ones include:

- i. Own price elasticity (how the demand for input i responds to changes in its own price):

$$\varepsilon_{i,i} = \frac{\alpha_{i,i}}{S_i} + (S_i - 1) \quad (18)$$

- ii. Cross-price elasticity (how the demand for input i responds to changes in the price of

$$\text{input } j): \varepsilon_{i,j} = \frac{\alpha_{i,j}}{S_i} + S_j, \quad i \neq j \quad (19)$$

- iii. Marginal cost elasticity of output (how marginal cost responds to changes in the price of

$$\text{input } i): \frac{\partial \ln MC}{\partial \ln P_i} = \frac{\alpha_{i,y}}{\varepsilon_{c,y}} + s_i \quad (20)$$

Where S_i is the share of total variable cost accruing to input i ($S_i \equiv \frac{P_i X_i}{C}$).

(ii) The translog profit function

The normalized restricted translog profit function for the output of a profit-maximizing producer subject to a given state of technology and a mix of fixed inputs, provided the marginal condition holds, can be given as equation (21) below:

$$\begin{aligned} \ln \pi^* = & \beta_0 + \sum_{i=1}^N \beta_i \ln P_i^* + \frac{1}{2} \sum_{i=1}^N \sum_{h=1}^N \beta_{i,h} \ln P_i^* \ln P_h^* + \sum_{i=1}^M \beta_s \ln Z_s \\ & + \sum_{i=1}^N \sum_{s=1}^M \beta_{i,s} \ln P_i^* \ln Z_s + \frac{1}{2} \sum_{k=1}^M \sum_{j=1}^M \phi \ln Z_s \ln Z_j \end{aligned} \quad (21)$$

where π^* is the normalised restricted profit (profit divided by output price), P_i is the price of variable inputs X_i (also normalised by dividing by output price), Z_s is the S th fixed input while $i=h=1,2,3,...,N$; and $s=j=1,2,3,...,M$. Following the common practice in the literature, labour and rice are assumed as variable inputs while capital is assumed as quasi fixed inputs (See Chaudhary, et al, 1998 and Latta and Adams, 2000): Thus, equation (21) can be expanded to be:

$$\begin{aligned} \ln \pi^* = & \beta_0 + \beta_l \ln P_l + \beta_c \ln P_c + \beta_{l,c} \ln P_l \ln P_c + \frac{1}{2} \beta_{l,l} (\ln P_l)^2 + \frac{1}{2} \beta_{c,c} (\ln P_c)^2 + \beta_k \ln k \\ & + \beta_{l,k} \ln P_l \ln k + \beta_{c,k} \ln P_c \ln k + \frac{1}{2} \beta_{k,k} (\ln k)^2 + e \end{aligned} \quad (23)$$

Where π^* is the normalized restricted profit (profit after tax); P_l , P_c and k represent the price of labour, price of rice and fixed input capital respectively. Capital (k) is measured as total asset of the respective food processing companies while other variables are measured as earlier defined. Note that both the profit and variable input prices are normalized by dividing through by the output price.

If the ratio of variable expenditure for the i th input relative to the restricted profit is defined as $S_i^* \equiv -\frac{P_i X_i}{\pi^*}$, the elasticity of supply with respect to i th variable input price can be obtained as given below (See Sindhu and Baanannte, 1981):

$$\varepsilon_{v,i} = -\left(S_i^* - \sum_{h=1}^N \beta_{i,h}\right) / \left(1 + \sum_{h=1}^N S_h^*\right) \quad (24)$$

The coefficients of the estimated translog cost equation (17) and profit equation (23) are used to compute the impact of rice restriction on demand for rice by the food processing industry (equation 18), the impact on the employment generated by the food processing industry (equation 19), the impact on the cost of the food processing industry (equation 20) and the impact on the output growth of the food processing industry (24). These impacts will be evaluated as elasticities which are computed at the mean of the data set.

2.3: Variables Measurements and Sources of Data

The computations with equations (10) to (14) above usually require few data which include; the value of domestically produced rice (VD), value of imported rice (VM), domestic farm prices of rice (P_d), average CIF calculated import price of rice (P_w), the *ad valorem* tariff level (t^g) and the tariff equivalent of non-tariff barriers (t^d). Also required are the estimates of the elasticities of demand (ε) and supply (η) of rice. It should be noted that using the domestic farm price corrects for the fact that market prices are already influenced by imported rice and other factors like trade margins and internal transportation expenses. This is important as imported and local rice are assumed to be perfect substitutes as consumers do not distinguish between them (Kohler, 2004 and Deardorff, 1997). Similarly, the use of CIF import prices corrects for the costs of transportation to the importing country (Deardorff, 1997 and Linkins and Arce, 2002).

Data on value of domestically produced rice (VD) and value of imported rice (VM) will be sourced from the UN COMTRADE database. The average CIF calculated import price of rice (P_w) will be obtained from the UN COMTRADE database by dividing the value of rice imports into Nigeria by the quantity. The information about the tariff rate (t^g) will be obtained from the Customs Tariff (Green) Books while that of the tariff equivalent of non-tariff barriers (t^q) will be computed using equation (15). Finally, the estimates of the elasticities of demand (ε) and supply (η) of rice were taken from the OLS regression of equations (6) and (7).

Four main variables are required to calculate the impact of rice prices on the food processing industry's costs, output growth performance and employment. These are (a) total cost of operation of food processing industry, (b) the output of food processing industry, (c) rice prices, and (d) employment in food processing industry. These data will be sourced from the annual reports of publicly quoted food processing companies which are assumed to constitute larger percentage of food processing activities in Nigeria.

3. Structure of the Rice Industry

3.1 *Definition of Rice and Types of Rice*

Rice is the seed of a monocot plant *Oryza sativa*. As a cereal grain, it is the most important staple food for a large part of the world's human population, especially in Asia, the Middle East, Latin America and the West Indies. It is consumed both with its bran coating and without. White rice, of which there are many types, is the generic name for bran-free rice. There are three types of rice with intact bran (whole-grain rice): wild rice, brown rice and the far less popular black rice. Brown rice has a nutty taste and chewy texture. It is considered healthier than

white rice because of its higher fiber content. White rice, however, has a much longer shelf life, cooks faster, and produces fluffier grains. Wild rice has a hard, almost woody texture along with a nutty taste and has similar health benefits as brown rice. Also, wild rice has the lowest calorie content of all types of rice.

Based on the rice cultivation patterns prevailing in the mid-1990s, irrigated rice systems predominate, covering about half of the global rice area and generating around three quarters of global output. Rainfed lowland rice production systems ranked second in importance, covering around 35 percent of rice land base, followed by the upland rice ecology, with 9 percent, and flood-prone ecosystems, with 3 percent of the world area under rice. The irrigated rice ecosystems are characterized by high cropping densities, intensive use of agrochemicals, energy and water. Yields under this system are highest, approaching the ceilings achieved at research stations, so the scope for further productivity increases appears limited in absence of major technological breakthroughs. There is, likewise, little potential for expanding the area under this ecosystem, given soaring costs of irrigation infrastructure, growing competition for water and energy and the progressive loss of rice land to urbanization. Irrigated rice systems are also associated with adverse environmental impacts, as intensive application of pesticides and fertilizers contaminates surface and underground waters, while flooded rice fields release high levels of methane (CO₄), the second most dangerous greenhouse gas after carbon dioxide (CO₂) contributing to global warming.

3.2: Global and National Value Chain

Global value chain concept describes the linkages of participants and their value creating activities that can enhance the movement of goods and services from production, processing to

the end users (consumers). The number and conduct of the participants along the chain determine its efficiency, pricing and returns accruing to each participant at every state (GVCI, 2007).

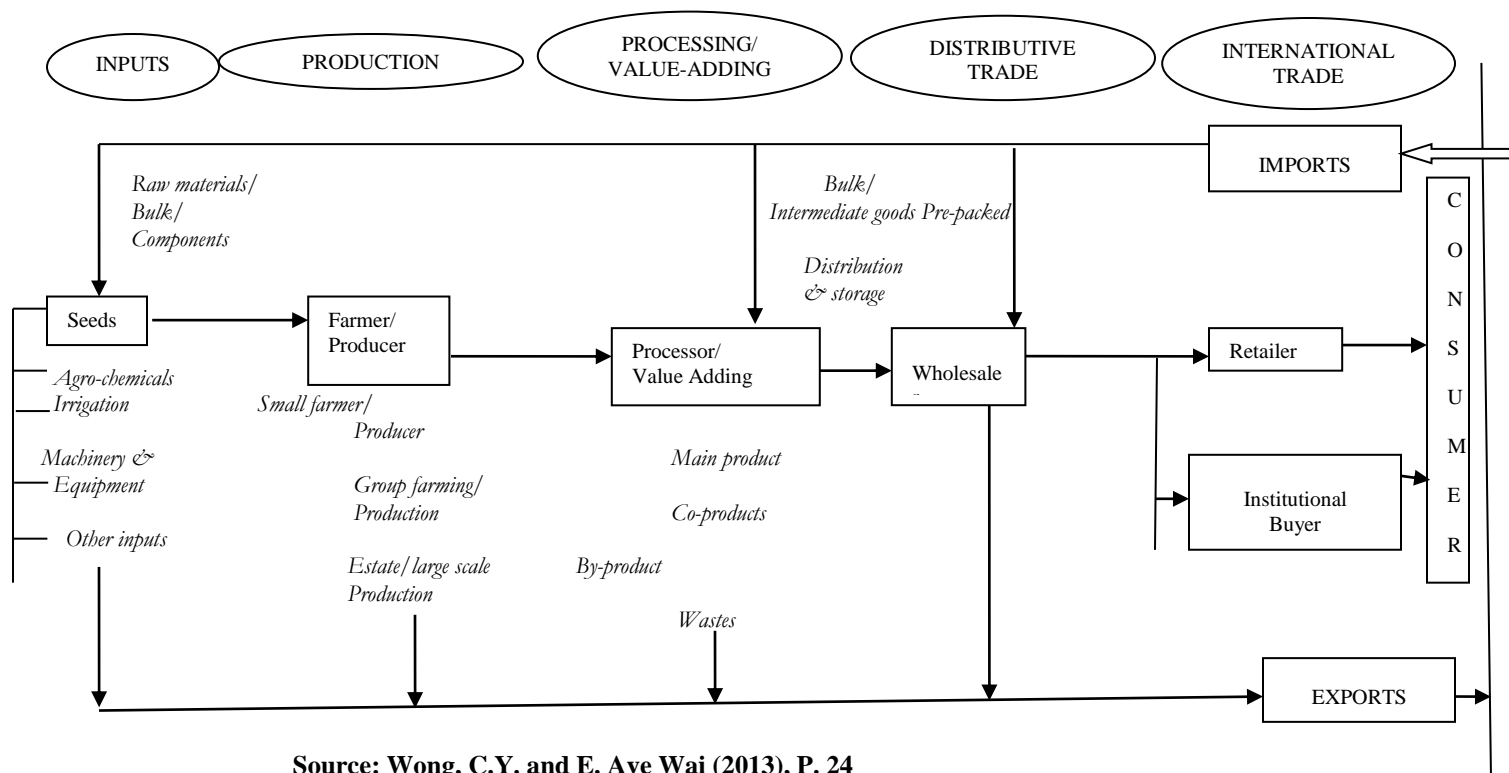
The global rice industry value chain shows all the economic activities along the supply chain and underscores some key points, including how agriculture can be leveraged to drive overall growth. Anchored on a supply chain management approach, rice value chain from global perspective is seen as the sequence of key activities. Furthermore, the attendant supporting economic activities at the various levels of the chain, from inputs, production, processing/value adding, distributive trade and international trade, linking producers to consumers, from ‘seed to shelf’ or ‘field to fork’ are captured in the value chain analysis.

All forms of off farm processing (and subsequent value adding) are captured in the manufacturing sector, as are the production of inputs and equipment. All wholesaling and retailing of fresh and processed agricultural products are captured as distributive trade under services. Figure 3.1 illustrates a generalized rice supply chain.

**Figure 3.1: Generalized Rice Supply Chain-From ‘Seed to Shelf’:
Potential Economic Activities**

Generalized Rice Supply Chain: From ‘Seed to Shelf’-Potential Economic Activities
Economic Activities Along Supply Chain

DOMESTIC OVERSEAS



Source: Wong, C.Y. and E. Aye Wai (2013), P. 24

The global supply chain captures five major economic activities, these are inputs, production (outputs), processing/value-adding, distributive trade (domestic trade), and international trade. At inputs level, seeds, agro-chemicals, irrigation, machinery and equipment, and other inputs such as land are the main elements. In the case of seeds as input, possibility of bulk purchase/acquisition is recognized in the chain. The inputs when channelled into actual production are to produce the main output which is paddy rice. This main output comes out of the economic activities of industry players who are farmers and producers who ventured into direct paddy production. The farmers/producers can be small farmers/producer, group farming/production, and indeed estate/large scale production involving corporate organization/institutions.

Beyond the production stage is the processing and value adding level. This economic activity at this level involves some elements of combination of main raw material (paddy rice) with other intermediate inputs like milling machines with a view to converting the main input (paddy rice) to different finished rice products as parboiled rice, co-products, by-products, and wastes. Distribution and storage of the products produced lead to the advancement of the value chain to wholesaling of the finished products. The first level of trading is from wholesalers to retailers and institutional buyers of rice like food processing firms and even corporate bodies. From retailing activities, the products of the value chain finally get to the consumers and the chain is perceived to be completed. It is useful to note that the international trade dimension of the rice value chain can imply some of the products going for export at the wholesaling level. The demand side of the product value chain in international trade is the importation of rice through the economic activities of the wholesalers. Once this happens, the imported products entered into the wholesaling channel and through this means the imported products finally get

to the consumers with the supporting activities of the retailers. With the full description of the economic activities involved in the global value chain for rice, the main industry players in the chain are: local producers and major types of farmers, paddy traders, parboilers, millers, traders of domestic rice, and importers/exporters of rice.

3.3: Structure of the Global Rice Industry

The changing structure of rice industry globally with respect to production, processing, and international trade is presented in Table 3:1 below.

Table 3.1: Rice and the structural transformation: 1961-2007

	1961	1980	2007
Rice (paddy) Production, MMT			
World	215.6	396.9	659.6
East Asia	78.9	163.0	206.7
South Asia	73.6	112.2	206.9
Southeast Asia	46.0	84.5	185.7
Africa	4.31	8.61	21.3
Rice as a % of Agriculture			
World	5.26	6.25	6.00
East Asia	18.9	20.2	8.34
South Asia	20.0	19.8	15.2
Southeast Asia	40.2	37.6	32.0
Africa	1.48	1.93	2.34

Source: www.asiafoundation.org

For paddy rice production, the concentration of production is found to be in Asia region and more than three-quarters of the world paddy production originates from the region. Rice as percentage of agriculture is equally substantial over time. One important striking structural issue with respect to international trade in rice is the emergence of the United States as one of the top five exporting countries and the emergence of a few African countries such as Nigeria, Senegal and Cote d'Ivoire in the list of major rice importing countries. The strategic interplay between the main activities in the global value chain is such that locations where rice is

produced dominates the consumption activity and to some extent the export activity as well.

Since 1961, the concentration of production has remained essentially the same as revealed in Table 3.2. The top five leading rice producing countries are all from Asia and this confirms the fact that as far as rice production is concerned, it is significantly dominated by Asian countries.

Table 3.2: Ten Leading Rice-Producing Countries: 1960-2013

1960/1961	1994/1995	2000/2001	2010/2011	2012/2013
China	China	China	China	China
India	India	India	India	India
Japan	Indonesia	Indonesia	Indonesia	Indonesia
Indonesia	Bangladesh	Bangladesh	Bangladesh	Bangladesh
Bangladesh	Vietnam	Vietnam	Vietnam	Vietnam
Thailand	Thailand	Thailand	Thailand	Thailand
Vietnam	Japan	Burma	Philippines	Philippines
Burma	Burma	Japan	Burma	Burma
Brazil	Brazil	Philippines	Brazil	Brazil
Philippines	Philippines	Brazil	Japan	Japan

Source: USDA PS&D Online.

3.4: Structure of the Nigerian Rice Industry

Rice is cultivated in virtually all of Nigeria's agro-ecological zones, from the mangrove and swamp environments in the coastal areas of the Niger Delta to the dry zones of the Sahel in the North. According to FAO statistics, Nigeria's rice production increased from 133,000 MT in 1961 through 343,000 MT in 1970, and 3.298 MT in 2000 to 4.570 MT in 2011. The same source shows yield per hectare rose steadily from 0.89 ton in 1961 through 1.37 ton in 1970 and 1.50 ton in 2000 to 1.77 ton in 2011.

Prevalent types of rice production systems in Nigeria include rainfed upland, rainfed lowland, irrigated lowland, deep water floating and mangrove swamp. Rice farms tend to be small-scale, averaging one to two hectares. Rain fed upland rice production accounts for 30 per cent of the total rice-growing area.

Irrigated rice systems account for 16 per cent of the total rice area in Nigeria (FAO data). Irrigated rice encompasses lowlands with good water control, enabling two crops per year. The yield obtained (3.5 tons/ha) is generally higher than in other systems. Irrigated rice systems include both large-scale irrigation schemes in the north and small-scale developed inland valleys in the south.

At national level, Nigeria's rice value chain is somehow complicated because of the size of the country, the prevalence of different production systems (rain-fed highland, rain-fed lowland, irrigated and swamp rice), and the range of processing clusters. The difference in processing clusters is significant because of the flow of rice from states without developed processing to states that have developed processing capabilities. There are five main channels that supply rice to Nigerian consumers.

- **Channel 1 serves the rural village market and is supplied by traditional farmers.**

This channel is supplied by traditional farmers who largely produce for personal consumption but sell their surpluses to the rural village market.

- **Channel 2 serves rural market towns and is a highly disaggregated channel that accounts for the majority of all marketed domestic rice.**

In channel two, rice normally changes hands at least four times en route to the end market and can include two types of service provision: parboiling and milling. This channel is characterized by speculation and trading as the product moves up the value chain. This is the dominant channel in the rice value chain, currently handling more than 80 percent of all of the rice that is processed and marketed, with thousands of millers around the country.

- **Channel 3 serves the middle-end urban market and includes medium-sized mills.**

In this instance, medium-sized is relative. These mills might process between 500 and 2,000 MT of rice per annum, but the actual quantities sold are always smaller, which is often a function of access to supply. Then mills will do the parboiling artisanally, though a few of

them have small mechanical parboilers. The core supply for these mills comes from millers' own production of quality paddy on medium to large-sized farms (20-50 hectares). This is complemented by paddy from outgrower schemes, where millers provide inputs and sometimes cash to their farmers (who have come from channel two). This channel has between 20 and 30 mills and only produces an estimated 10,000-20,000 MT per annum.

- **Channel 4 is the large-scale, directed, industrial mill channel targeting import substitution with high- quality locally grown rice.**

Two major mills in this channel are Olam and Veetee, which both came online at the end of 2008. Over the last four years, and with substantial assistance from USAID, Olam has invested in developing 10,000 contract growers to ensure a regular supply of quality paddy for its top-end product. Close to 20,000 contract growers are actually needed. Olam guarantees the delivery of necessary inputs to the farmers, assists them with access to credit through commercial banks, and buys all of their product. USAID supports the softer side of the directed channel development by funding extension services to ensure that the right package of practices (POP) is adopted by the farmers. Veetee did not invest in developing growers and now has problems sourcing quality paddy for their mill. Due to the FGN's industrial mill initiative, it is expected that ten new mills will be online within five years, so there will be a need for a significant increase in supply of quality paddy.

- **Channel 5 is the imported rice channel, predominantly serving a high-end urban market.**

There are a number of major multinational corporations that dominate legal rice importation, including Stallion, Veetee, Olam and others, that import 200,000 MT or more per annum on a regular basis. This rice is usually packed in Thailand in the final branded bags for each major group and contains a series of different levels of quality and price in the respective product categories. These major distributors have well-developed systems for selling to wholesalers,

though most of the sales take place in Lagos. Some of them have invested in polishing plants to polish brown rice into finished white rice. This was a result of the reduced duty regime for brown rice (compared to completely milled rice) that was provided to importers who attained a special license, although the special duty regime is no longer in effect.

4. Rice Industry Policy Environment

4.1 Global Policy Environment

Since 1995 there have been some changes in rice policies both in the high-income developed countries as well as developing economies. The policies are in two forms, namely, production support policies and trade-related policies.

Production Support Policies

In the EU, producer support amounts to 351 Euros per ton and includes intervention stocks to support paddy price and direct payment to farmers. In Japan, total rice support costs taxpayers an equivalent of 2.8 billion US dollars (USD) per year as most of the support is in the form of import restrictions which raise the domestic price, implicitly taxing consumers. A producer price floor based on moving average past-prices is in place. As a result, producer price in Japan is ten times higher than that of other japonica rice produced in other countries such as China. Moreover, consumer price in Japan is three times higher than that in the rest of the world. To avoid large surpluses, Japanese rice farmers receive payments to reduce their acreage under the Production Adjustment Promotion Program (PAPP). About 1 million ha of rice land have been ‘diverted’ so far under PAPP. Farmers participating in the Production Adjustment

Promotion Program can also benefit from a price deficiency payment program which pays up to 80% of the difference between a seven-year moving average and actual prices.

Since April 2004, a new reform policy, the 'Rice Policy Reform Law' has been implemented to divert rice production by limiting volume of production per prefecture. The government will give farmers who participate in the new program about 10% of their existing income. In Korea, about 91% of total Aggregate Measure of Support (AMS), which amounts to 1268 billion Won (or about 1 billion USD) a year, is for rice alone. Price support policy in Korea involves direct government purchase of part of the production at a price 25% higher than market (domestic) price. Under URRA, government has reduced price and quantity of the government purchase. Although Korean government purchases of rice now represent only a small fraction of the total production, AMS remains large because domestic market price is much higher than the border price.

In the U.S., a price support program is currently implemented in the form of marketing loan of about 143 US dollars (USD) per metric ton (MT) of paddy rice. Moreover, U.S. producers receive income support through two payment programs: a fixed decoupled direct payment and a decoupled counter-cyclical payment. The U.S government offers also contract payments to its farmers to reduce acreage. There are conservation programs that take land out of production along with financial help to install better practices of land conservation. There has been little adjustment in the rice program as rice represents only a small fraction of agricultural activity; the U.S rice imports are 12 % of domestic consumption. Nominal rice PSE in the U.S is estimated at 120 USD per MT of milled rice in 2002.

Australia has the lowest level of producer support among the OECD countries. In 2002, nominal PSE is estimated at 17 USD per MT. In Taiwan, government procurement to ensure

food security has been limited to a smaller amount per hectare. Government purchase (26% of production between 1996 and 2000) is stocked and used to maintain price within certain ranges. In 2000, guaranteed price per MT was about seven times higher than f.o.b price (USD 981 vs. USD 144). Under the ‘Riceland Diversion Program’, more recently replaced by the ‘Rice Paddy Utilization Adjustment Program, Taiwan started reducing support (which was 30-40% of AMS in 2001) to farmers and encouraged them to divert to other crops.

According to OECD (2013), the policy interests of most countries have focused largely on ensuring a reliable supply of safe, nutritious and affordable food, reasonable incomes for farms and farm households, a productive and competitive food and agriculture sector, and sustainable use of natural resources. Statistical evidence on the OECD average revealed that the level of support has been following a downward trend, with levels of 37% of gross farm receipts in 1986-88, 30% in 1995-97 and 19% in 2010-12. Furthermore, the share of the potentially most production and trade distorting forms of support has equally reduced from 33% of gross farm receipts in 1986-88 to 23% in 1995-97 and 11% in 2010-12. This shows that the shift in the nature of support provided is a marked improvement.

Production enhancing policies are often motivated by stated self-sufficiency targets by different countries. For example, China maintains a 95% self-sufficiency target for grains, while Indonesia has set self-sufficiency targets for rice, sugar, soybeans, maize and beef to be achieved by 2014. Support based on output; notably through higher market prices appears pervasive. Most countries maintained prices received by farmers above the levels of international markets. In China, 2012 minimum prices for rice and wheat were increased by higher domestic prices. These prices were complemented by output-based payments in several countries, thus further raising effective producer prices. Input-based support is also wide-spread and of particular importance in

emerging economies – but changes to input support regimes have been limited. Subsidies for the production and use of fertilizers are important elements in Indonesia where they are paid to fertilizer plants, and in China where they are mostly paid on an area base. In Russia, fertilizer subsidies to agricultural producers were also important, but were eliminated in 2013 to become part of a new area payment.

Trade Policies

High tariff rates and limited quota on import, and high export subsidy characterize the trade policies of high-income developed countries producers of rice in OECD. These policies remain in place despite efforts to dismantle them and despite trade preference towards selected low-income countries. The EU applies tariff escalation; tariff for milled rice import is, for instance, about 416 Euros per ton while that for paddy import is 211 Euros per MT. Tariffs on variety of rice such as brown Basmati from India and Pakistan were low and have been eliminated recently. Countries in the Africa Caribbean and Pacific (ACP) group and the EU's Overseas Countries and Territories (OCT) receive a quota of 110 thousand MT with little or no tariff. The EU subsidy expenditure for rice export, following the Uruguay Round has been limited to 37 million Euros per year. Moreover, export refunds are set to 133 thousand tons of milled rice per year.

Japan shifted from absolute quota to tariff rate quota in 1999. Quota is 0.682 million MT per year (7.2% of average consumption) including rice products and preparations. In-quota tariff is zero but over-quota is high, about 341 Yen per kg (about USD 2800 per MT), in 2001. Imported rice is purchased by the government and exported as food aid or sold to local food processors who use rice as an input. The government food agency holds the exclusive right to

import rice and collects a margin of up to 2.41 Yen per kg (USD 200 per MT) when rice is sold. Japan imports only expensive and relatively high quality Japonica rice from Australia and US (California).

Rice imports to the U.S. are highly protected also. For instance, a tariff of 14 USD/MT is applied for milled rice, 21 USD/MT for brown rice, and 18 USD/MT for paddy rice⁴. US exports account for 12% of global rice trade. An Export Credit Guarantee Program was implemented to help foreign importers deal with unfavourable treasury problem or exchange rate fluctuation and to ensure that the U.S exporters will be paid. The Export Enhancement Program was implemented only between 1986 and 1996, and it has not been reinstated.

A wide range of policy support measures has been used in the OECD countries in favour of domestic rice production. An indicator which captures all these is the producer support estimate (PSE). The monetary value of policy transfers as a percentage of gross farm receipts is the percentage PSE. This indicator varies across the OECD countries and across agricultural commodities. Rice is one of the commodities with the highest % PSE. Thus, the % PSE for rice, on the average, was 81 during 1986 – 88 and fell subsequently to 78 in 2001 – 2003 and to 54 over the 2007 – 09 (OECD, 2004; 2010).

Despite the gamut of policies embarked upon by various countries to influence the rice industry globally and at individual country level, no significant locational and structural shifts occurred. As argued in the previous section, dominant countries at various activity levels in rice global chain have remained fairly the same over the last five decades. The only exception to this general observation is in the area of international trade in rice where global policies and domestic national policies have altered the set of exporting and importing countries of rice to some extent.

4.2: Policy Environment in Nigeria

In Nigeria, during the 1970 – 2013 period, rice import restrictions have mostly been implemented through a combination of tariffs and prohibitions. Table 4.1 presents a summary of these import control measures.

In the case of tariffs, the trend over the years was erratic. During 1970 – 74, import duty on rice averaged 66.6%; then the average tariff fell to 14.75% in the 1975 – 78 period. This was followed by an up-turn in the rate such that over the 1979 – 87 period, the average tariff rate rose to 19.0%. This upward trend continued as the average duty rose to 26.1% during 1988 – 94, through an average of 58.3% in the 1995 – 2000 period to an average of 99.3% between 2001 and 2007. Finally, the average tariff fell to 55.5% during 2008 – 2013, although the rate for 2013 was 110%. In the case of import prohibition, the use of this import control instrument for rice started in October 1978 and has continued in one form or the other ever since.

Table 4.1: Nigeria's Rice Trade Policy Measures, 1974 – 2013

Period	Policy Measures
Prior to April 1974	66.6% tariff
April 1974 – April 1975	20%
April 1975 - April 1978	10%
April 1978 – June 1978	20%
June 1978 – October 1978	19%
October 1978 – April 1979	Imports in containers under 50kg were banned
April 1979	Imports under restricted licence, only government agencies.
September 1979	6 months ban on all rice imports
January 1980	Import license issued for 200,000 tonnes of rice
October 1980	Rice under general import license with no quantitative restrictions
December 1980	Presidential Task Force (PTF) on rice was created and it used the Nigerian National Supply Company (NNSC) to issue allocations to customers and traders
May 1982	PTF commenced issuing of allocations to customers and traders in addition to those issued by NNSC
January 1984	PTF disbanded. Rice importation placed under general license restrictions.
October 1985	Importation of rice (and Maize) banned
July 1986	Introduction of Structural Adjustment Programme (SAP) and the

	abolition of Commodity Boards to provide production incentives to farmers through increased producer prices
1995	100%
1996	50%
1998	50%
1999	50%
2000	50%
2001	85%
2003	100%
2005	110%
2007	100%
2008	0% for 6 months
2009	32.9%
2010	10% import duty and 20% levy on milled/broken rice
July 2012	30% levy on brown rice and 50% levy on polished/milled rice
2013	110%

Source: Federal Government Budgets, 1984-1986, 1995-2000; USDA Foreign Agricultural Service GAIN Report 2013, Nigeria Grain and Feed Rice Update.

Beyond the employment of various trade policy measures as summarized by Table 4.1 above, the Federal government embarked on some policies meant to directly influence the Nigerian rice industry. Three of these initiatives deserve further discussion below.

(a) Presidential Initiative on Increased Rice Production, Processing and Export

The Presidential initiative on rice is the new production strategy by the present administration for sustained increase in rice production for national self-sufficiency, food security and export promotion. As at 2002, the rice import bill had risen to ₦96.012 billion. This initiative has as its objective, the need to address the widening demand/supply gap and attain self-sufficiency in rice production by 2005 and have surplus for export by 2007. This objective has, clearly, not been achieved. In fact, rice import value rose steadily from \$361 million in 2005 to \$825 million in 2010.

The federal government is currently encouraging the entry of big private sector players with cognate experience in value chain management (e.g Olam and Veetee) into the rice processing business by granting them concession to import brown rice at 50% import duty

tariff which they apply for and obtain through the presidency. The condition required for this concession is to prove that there is not enough rice paddy in Nigeria to feed the mills. This concession is for a period of about two years pending the time they would be able to organize farmers to produce enough paddy. There is also duty incentive of about 21/2% on agricultural equipment to encourage foreign direct investments either on-farm or processing.

(b) National Food Reserve Agency (NFRA)

The Coalition for Africa Rice Development (CARD) which is an initiative for doubling rice production in sub-Saharan Africa over a (10) years period was launched at the Tokyo International Conference on African Development (TICAD IV) in May, 2008. CARD was jointly developed by the Alliance for Green Revolution in Africa (AGRA) and the Japan International Cooperation Agency (JICA). Nigeria happened to be among the twelve pilot countries selected for the first phase of programme implementation. The scheme acknowledged that Nigeria possesses huge vastly untapped potential for irrigated rice development. There is an estimated 3.14 million hectares of irrigable land out of which less than 50,000 hectares is currently under rice irrigation. Large irrigation schemes exist in Anambra, Kwara, Kogi, Adamawa, Niger, Sokoto, Kebbi, Borno, Bauchi/Jigawa and Benue States. Rice yield in these schemes is between 3.0 – 3.5 t/ha compared to the potential of 7 – 9 t/ha. Therefore, in terms of geographic priorities, emphasis is to be put primarily on irrigated and rain-fed lowland rice development.

Although there is an urgent need to rehabilitate existing irrigation schemes and put more land under cultivation, processing remains the major bottleneck to increasing national rice supply. National processing capacity found to be low and huge processing gaps exist. For example, in 2007 paddy production stood at 3.4 million tonnes and only 1.4 million tonnes

were processed. The national processing capacity is 2.8 million tonnes of paddy. Modern rice processing equipment need to be introduced to bridge these gaps. Consequent upon the situation analysis of the rice industry in Nigeria, the NRDS sets as its overall goal and vision the task to increase rice production in Nigeria from 3.4 million tonnes paddy in 2007 to 12.85 million tonnes by the year 2018. In this context, ten companies were selected for the establishment of 17 large scale rice milling plants across the country. These companies were also assisted with subsidized credit of ₦9.52 billion.

(c) Agricultural Transformation Agenda

The rice transformation agenda of the President Goodluck Jonathan's administration is predicated against the objective of self sufficiency in rice production and complete substitution of imported rice by year 2014. The agenda recognized the fact that locally produced rice is uncompetitive in the market because its value chain is fragmented and cannot offer a standard. It is fraught with poor quality- presence of extraneous materials such as stones and debris. Secondly most operations are manual and cost of production is also high.

The rice transformation agenda intends to adopt the value chain approach to form a nucleus estate around the existing rice mills. Clusters of rice production will be identified and the farmers therein will be organized in a way that they can readily access inputs such as improved seeds, fertilizer, agrochemicals and modern methods of rice production from extension services. Each cluster will use improved seeds of recommended rice varieties and supply paddy to the mill. Using the modern methods as expected, paddy yield per hectare is expected to double by year 2014 and raise milled rice production to 5.7 million MT per year.

Rice production under rainfed lowland and irrigated lowland will be the main priority, but attention will be paid to rainfed upland rice in some key States. Fifteen States which

produce mainly lowland rice have been selected for the transformation agenda. They are: Kebbi, Sokoto, Kano, Niger, Kaduna, Taraba, Adamawa, Kwara, Ebonyi, Cross River, Bayelsa, Borno, Enugu, Ekiti and Ogun. The State governments and their Extension Services are to be involved in the formation of the clusters and the enumeration of the farmers. The FG is to enact a policy which will encourage input suppliers, agro-dealers, mills and rice merchants to contribute to the cost of extension services. It is also the intention of the agenda that the FG should also revisit the tariff structure to make it 30% flat on both brown and milled rice. Through price arrangements and guaranteed minimum price, continuous paddy supply to mills is expected. The demand for paddy by the mills is expected to drive paddy production. While paddy production is expected to rise to 1,500,000 MT by year 2015. Total milling capacity of the recently procured mills is 500,000. More mills and storage facilities will be needed. Expected impacts include conservation of foreign exchange, food security and creation of about 500,000 jobs.

The main conclusion arising from the review of Nigerian rice policy environment is that governments in Nigeria have attempted to improve on the performance of the rice industry in the economy, mainly through policies that focus on the management of rice importation. Hence, diverse restrictive and outright prohibiting measures have been embarked upon. Recent efforts are now focusing on the supply side.

5. Rice Industry Performance

5.1: Performance of Rice Industry: Global

Production

Volume of rice production has been on the increase over time. In 1961, output of paddy rice production stood at 215.6 million MT tons. This figure has jumped more than three folds to 722.8 million MT tons in 2011.

Asia has continually remained the hub of at least 90 percent of world rice production (Table 5.1), with China and India responsible for almost 50 percent of the world aggregate.

Consumption

Global consumption of rice has also increased substantially within the period of 1960 to 2011, from 156.1 million MT tons to 456 million MT tons.

As it has been observed in the case of production, consumption of rice is highly concentrated in the Asian region and top five consuming countries correspond to the top five producing economies, namely China, India, Indonesia, Bangladesh, and Vietnam.

Rice Export

International trade in rice has been more volatile than the production and the consumption. Fluctuations observed in the quantity and value of rice exported over time suggested that world export value of rice rose significantly whenever the export supply is low.

Proportional analysis of sources of global rice export supply again revealed that the major suppliers of rice to the international market all belong to Asia. At regional level, Asia supplied more than half of the world rice export aggregate. Unlike the concentration of both production and consumption of rice in Asia, export supply of rice is fairly less concentrated with the

appearance of country such as Egypt, United States of America, and Italy at one time or the other between 1961 and 2010.

The concentration of rice exports in a few countries has a lot of implications for international trade in rice. The fact that the bulk of rice exports comes from a relatively small number of countries makes trade in rice particularly susceptible to changes in government policies in the key countries concerned. For example, in recent years, Vietnam repeatedly imposed restrictions on exports with a view to averting shortages on the domestic market. Between 2001 and 2004, India embarked on export subsidies which led to a strong expansion of trade but at the same time to low world price quotations.

Import

Between 1961 and 2010, the quantity of rice imported peaked at about 32.5million MT in 2007 while the value of imported rice globally was at the highest in 2008 when the value stood at 22.1million US\$.

Analysis of the share of rice imported in the world along regional lines shows that in the past, Asia used to be the largest importer of rice. As at 1970, Asian share of global rice import was above 70 percent. However, the share has since been declining since 2005 and recent share stood around 45 percent of world import aggregate. As the share of Asia in world rice import began to decline, the corresponding share of Africa has increased.

Concentration of global imports is very low. In 1961, the share of the top leading importing countries that were all Asian countries was below half of the quantity of rice imports recorded for the year under review. Indeed, subsequent shares of the top five countries declined progressively with the effect that only about one-quarter of the world rice imports can be associated with the leading rice importing countries. The polarisation of the list of the top five

countries has also been very obvious with the presence of African countries such as Nigeria, Senegal, Cote d'Ivoire and Saudi Arabia in recent time.

5.2: *Performance of Rice Industry: Developing Countries*

The impact of developing countries in the global rice industry varies depending on their grouping. For instance, the Low-Income Food Deficit Countries (LIFDCs) accounted for over 40 percent of global rice production in recent times. This large proportion is explained by the fact that most Asian rice producing countries are classified as LIFDCs and their presence in the group has positively influenced the volume of rice production by developing countries. Indeed, an Asian country consistently occupied the first top rice producing country in the group of LIFDCs since 1961 to 2010. It is however important to remark that a few African countries made the list of top five rice producing countries in LIFDCs. Such countries include Nigeria, Senegal, Cote d'Ivoire and Benin.

Coming down to the African region, rice production deficiency of the region is evidently clear as Africa's share of the world rice production has ever stood below 4 percent of rice world aggregate. The top five producing countries in Africa and their shares in global rice production are presented in Table 5.1.

Table 5.1: Paddy Rice Production: Top Five African Producing Countries

	Country	Country Output	World Total	Africa Total	World's Share	Africa's Share
2010	Madagascar	4737970	701127975	25878316	0.7	18.3
2010	Nigeria	4472520	701127975	25878316	0.6	17.3
2010	Egypt	4329500	701127975	25878316	0.6	16.7
2010	United Republic of Tanzania	2650120	701127975	25878316	0.4	10.2
2010	Mali	2305610	701127975	25878316	0.3	8.9
Share of the Top Five Producing Countries					2.6	71.5
2011	Egypt	5675030	722760295	26531818	0.8	21.4
2011	Madagascar	5078420	722760295	26531818	0.7	19.1
2011	Nigeria	4567320	722760295	26531818	0.6	17.2
2011	United Republic of Tanzania	2248320	722760295	26531818	0.3	8.5
2011	Mali	1741470	722760295	26531818	0.2	6.6
Share of the Top Five Producing Countries					2.7	72.8

Source: Computations Based on Data from FAOSTAT

Except that the top five countries accounted for more than 70 percent of Africa's rice production, the share of all the five countries in global rice output remains very low. The share marginally rose from 2.6 percent in 2010 to 2.7 percent in 2011.

Domestic consumption of rice in Sub Saharan Africa (SSA) and Africa has increased over time and evidence available has shown that the share in rice consumption globally has equally increased from 1.7 to 5.1 percent in 1961 and 2011, respectively for SSA. Similarly Africa's share in global rice consumption rose from 2.2 in 1960 to 6.0 percent in 2011 (Table 5.2).

Table 5.2: SSA and Africa's Domestic Consumption Share in World Total Consumption

Year	1960	1970	1980	1990	2000	2005	2006	2007	2008	2009	2010	2011
SSA	1.7	1.8	2.2	2.7	3.3	4	4.1	4	4.1	4.5	4.8	5.1
Africa	2.2	2.4	2.8	3.2	4.1	4.8	5	4.9	5.1	5.5	5.7	6.0

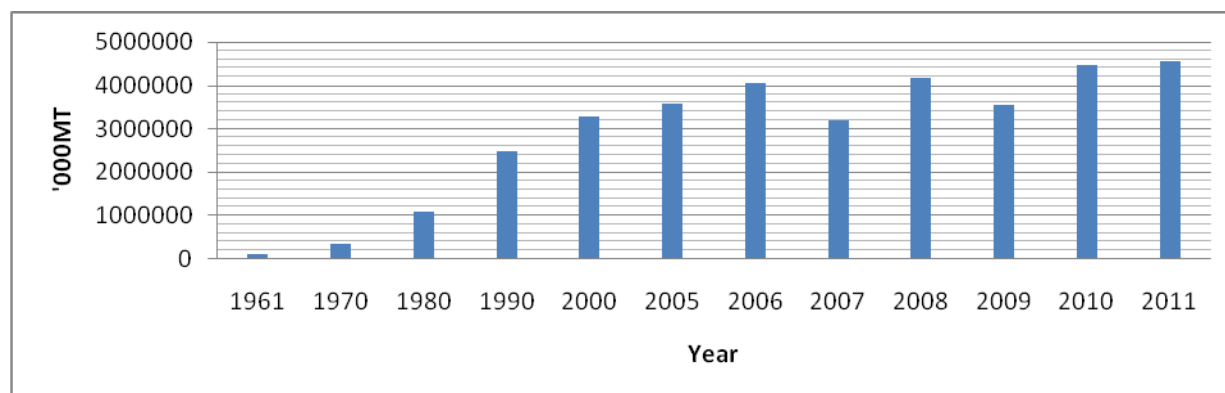
Source: Computations Based on Data from FAOSTAT

5.3: Performance of Rice Industry: The Case of Nigeria

The production of paddy rice in Nigeria rose from 133,000 MT in 1961 to about 4.6million MT in 2011. As shown in Figure 5.1, the output has fluctuated substantially

particularly in 2007 and 2009. Output declined by 21.2 percent in 2007 and by 15.1 percent in 2009. These experiences could hardly be dissociated from the world food crisis of 2007-2008.

Figure 5.1: Nigeria Paddy Rice Production, 1961-2011



Source: Computed from FAOSTAT data

The share of Nigeria's rice production in world aggregate has been very low, in spite of its increase from 0.1% in 1961 to 0.6% in 2011. Nigeria's share of African rice production rose from 3.1% in 1961 to 10.1% in 2011; while its share of West African rice output rose from 17.2% to 35.5% over the same period (see Table 5.3).

Table 5.3: Nigeria's Share of Paddy Rice Production

Year	Nigeria/World	Nigeria/LIDCs	Nigeria/Africa	Nigeria/West Africa
1961	0.1	0.1	3.1	10.1
1970	0.1	0.3	4.7	16.4
1980	0.3	0.7	12.7	33.9
1990	0.5	1.1	19.7	45.4
2000	0.6	1.3	18.9	46.3
2005	0.6	1.2	17.6	42.3
2006	0.6	1.4	18.4	43.2
2007	0.5	1.1	15.2	39.9
2008	0.6	1.3	17.1	40.2
2009	0.5	1.1	15.0	33.7
2010	0.6	1.4	17.3	36.0
2011	0.6	1.3	17.2	39.0

Source: Computations Based on Data from FAOSTAT

At the level of domestic rice consumption in Nigeria, Table 5.4 presents the quantity of rice consumed domestically in Nigeria as well as the share of with respect to world aggregate consumption. As it was in the case of production, the share of domestic consumption in 2011 was 1.2% of world aggregate; while the share at the African level was 19.9%, compared to 23.3% in Sub-Saharan Africa and 35.5% in West Africa.

Table 5.4: Nigeria's Domestic Consumption of Rice Milled

Year	World	Nigeria	Nigeria/World	Nigeria/Africa	Nigeria/SSA	Nigeria/WA
1960	156,139	240	0.2	7.0	9.2	16.8
1970	209,876	285	0.1	5.6	7.4	14.6
1980	270,066	850	0.3	11.3	14.2	25.1
1990	343,821	2,757	0.8	24.7	30.0	47.7
2000	393,697	3,029	0.8	18.8	23.6	37.9
2005	411,511	3,800	0.9	19.1	23.4	37.7
2006	418,392	4,040	1.0	19.4	23.7	38.2
2007	425,724	4,000	0.9	19.2	23.6	38.2
2008	435,545	4,220	1.0	19.0	23.8	37.6
2009	435,177	4,350	1.0	18.3	22.4	35.9
2010	443,504	5,000	1.1	19.9	23.3	36.3
2011	456,100	5,400	1.2	19.9	23.3	35.5

Source: Computations Based on Data from FAOSTAT

The table shows that Nigeria's share of consumption is higher than that of production at all levels, that is, whether at world, regional or sub-regional level.

Nigeria's presence in international trade for rice is lopsided in favour of rice importation. In other words, rice export in Nigeria has been so insignificant over time since 1961. Rice import has been prevalent in Nigerian import profile since 1961. In 1961, the quantity of rice imported stood at 1,100 MT translating to 200 thousand US\$. By 2011, rice import has risen to 1.9 million MT at the cost of 825 thousand US\$ (Table 5.5).

Table 5.5: Nigeria's Rice Export Supply, 1961-2010

	Rice Export				Rice Import			
	Quantity		Value		Quantity		Value	
	World	Nigeria	World	Nigeria	World	Nigeria	World	Nigeria
1961	6308513	49	702550	3	6573448	1100	785391	200
1970	8397136	0	1192367	0	8813011	1749	1317293	190
1980	12938928	0	5010870	0	12769194	450000	5369217	245000
1990	12458418	0	4136911	0	12267820	224000	4659297	60000
2000	23547339	0	6503233	0	22840554	785745	7287711	207078
2005	29503792	4368	9603759	1357	27985981	1187786	10233075	361048
2006	30550053	2497	10532712	838	29759768	975907	11336570	295585
2007	33709562	251	13735348	79	32458951	1216962	14254611	480740
2008	29734397	46	20080042	23	30908499	971815	22122745	771739
2009	29733848	1	19112114	1	29547291	1164335	20091054	730591
2010	32768264	94	19469100	8	31188735	1885334	20102366	825411

Source: Computations Based on Data from FAOSTAT

In terms of the share of Nigeria's export and import, Table 5.6 reveals that the shares are higher with respect to import than export. The emerging fact from this finding is that despite the various restrictions put in place by various governments in Nigeria, rice importation has managed to register greater impact in world rice trade. In addition, this scenario of higher import share for Nigeria has also revealed the dependence of the country on international supply of rice to meet the demand for the commodity in the first place and more importantly to address the challenge of food shortages.

Table 5.6: Nigeria's Rice Export and Import Quantity Shares, 1961-2010

Year	Export Shares				Import Shares			
	Nigeria/ World	Nigeria/ LIDCs	Nigeria/ Africa	Nigeria/ WA	Nigeria/ World	Nigeria/ Africa	Nigeria/ LIDCs	Nigeria/ WA
1961	0.0	0.0	0.0	0.4	0.0	0.2	0.0	0.4
1970	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4
1980	0.0	0.0	0.0	0.0	3.5	18.4	8.1	27.9
1990	0.0	0.0	0.0	0.0	1.8	7.1	4.8	11.9
2000	0.0	0.0	0.0	0.0	3.4	15.7	7.9	27.0
2005	0.0	0.1	0.4	14.0	4.2	13.6	9.1	22.7
2006	0.0	0.0	0.2	1.9	3.3	10.8	7.3	19.0
2007	0.0	0.0	0.0	0.2	3.7	12.8	7.8	21.8
2008	0.0	0.0	0.0	0.0	3.1	10.8	7.2	17.1
2009	0.0	0.0	0.0	0.0	3.9	12.8	9.2	20.4
2010	0.0	0.0	0.0	0.0	6.0	20.9	13.2	32.3

Source: Computations Based on Data from FAOSTAT

One of the major findings from the analysis of the performance of rice industry at global, developing countries and national levels is the discovery that the Nigerian rice industry essentially reflects the broad characterization of the industry in some developing countries and Africa in particular. Production of rice is found to be trailing behind domestic consumption. Also, rice import is predominantly higher than rice export in Nigeria just as it is the case for Africa as a region.

6. Rice Import Prohibition Policy

6.1. Import Regulation and Waiver

Nigeria has at its disposal several fiscal policy instruments for the control of imports. Among the most potent of these is the power to place a ban on the importation of any product. This power is exercised in two forms. In one case is the Absolute Import Prohibition; while the other is “ordinary” Import Prohibition.

When the power is exercised in the first form, the product in question is legally prevented from being imported into Nigeria under any circumstances. This form is generally applied to protect health, moral standards and national security. Because it is “absolute”, the regulation does not admit of waiver. In the case of ordinary Import Prohibition, however, the regulation is subject to waiver. Its primary purpose is to enable the government to determine (a) the quantity of the affected product which is allowed to be imported over a specified time period and (b) who the importers are.

The power to grant a waiver may also be exercised in either or both of two ways. Thus, the waiver may be granted to permit an importer to bring in a certain quantity of the specified product. In addition, a waiver may relieve the importer of the “burden” of paying all or only part of the applicable customs duty. Duty waiver applies to all categories of imports, of course.

Thus, an importer may enjoy having the import prohibition regulation waived; and may also benefit from the waiver of all or part of the relevant customs duty charges.

6.2 Operational Modalities

In general, the ultimate power to place any product under import prohibition and to remove it, as well as the power to grant both types of waivers described above lies with the President. The operational modalities require the importer seeking either type of waiver to lodge an application with the Minister of Finance. This application is processed through the Tariff Technical Committee and the Tariff Review Board on the basis of which an appropriate recommendation is made by the Minister of Finance for approval by the President.

6.3. Implementation Experience

In relation to both paddy and milled rice, this import regulatory power has been frequently and generously invoked since the early 1980s. Most of the beneficiaries have been private companies. But during the first half of the 1980s, a government parastatal, the Nigerian National Supply Company (NNSC), was initially designated as the sole importer. This was later relaxed to allow the re-entry of private importers into the rice importation business. Eventually, the NNSC was disbanded as part of the deregulation policy under Nigeria's structural adjustment programme which fully returned this business to the private sector.

Over time, all aspects of the import prohibition policy have been subjected to both external and internal criticism. Virtually every WTO Trade Policy Review of Nigeria has cited this policy for being in violation of Nigeria's commitment. In response, the Nigerian government has typically requested for time to phase it out in an orderly manner. At the local

front, the process of granting import prohibition waivers has been criticised for being opaque, secret, discriminatory and liable to corruption.

7. Comprehensive Quantification of the Total Economic Benefits and Costs of Rice Industry Protection

7.1: Introduction

During the period between 1970 and 2010, domestic production of rice received protection from foreign competition through import tariffs, particularly in the 1970 – 1985 part of the period, and through a combination of tariff and import prohibition in the latter part (i.e. 1986 – 2010) of the period. This second part is further divided into import prohibition that is combined with relatively low tariff (1986-1995) and import prohibition with high tariff (1996-2010). The analysis is carried out at two levels of competition in order to ensure that the specific domestic and imported products are as close to being perfect substitutes as possible. The first level is between domestically-produced paddy rice and imported brown (husked) rice while the second competition level is between domestically milled rice and imported parboiled rice. The two levels of analysis are performed in order to determine: (i) whether the tariff differential between paddy and processed rice matter for policy and (ii) the extent to which importation of brown rice has affected local production of paddy rice and local milling respectively. The analytical framework described in section 2 above is used to quantify both the economic benefits and costs of the three dimensions of the protection regime. In what follows, section 7.2 focuses on economic benefits; section 7.3 discusses the economic costs; while section 7.4 examines the net economic costs/benefits. In each of these sub-sections, the distribution of these benefits and costs is also analysed. The summaries of the quantified benefits and costs discussed below are

those computed on the basis of CBN Statistical Bulletin and FAOSTAT data. Full analyses of these summaries are presented in Appendix I which comprises the detailed year-by-year data.

7.2. Economic Benefits

As explained in section 2 (Theoretical Framework) above, the imposition of an import tariff on a product reduces the quantity of the product which is imported, increases the quantity which is produced domestically, and raises the price per unit at which the product is sold. As a result, local producers receive economic benefits through the producers' surplus (area (a) in Figure 2.3), while the government gains through the receipt of associated tariff revenue (area (c) in Figure 2.3). These economic benefits are measured in terms of expenditure or amount of money spent on the quantity of the product purchased by consumers. These measures of economic benefits are presented in Table 7.1. It is important to recall from the theoretical discussion in section 2, that from an economy-wide perspective these gross benefits are merely a transfer of purchasing power from rice consumers to rice producers and the government.

Table 7.1

<u>Economic Benefits of Rice Import Restrictions</u>					
(a) Tariff Restriction Period (1970-1985)	Average Annual Expenditure (N billion)	Average Annual Producers' Surplus		Average Annual Government Gain (N billion)	
		(N billion)	% of Total Benefits	(N billion)	% of Total Benefits
<u>Paddy/Brown rice</u>	0.37	0.05	83.3	0.01	16.7
<u>Milled/Parboiled Rice</u>	0.34	0.04	80.0	0.01	20.0
(b) Low Tariff and Import Restriction Period (1986-1995)					
<u>Paddy/Brown rice</u>	23.37	13.53	96.4	0.51	3.6
<u>Milled/Parboiled Rice</u>	6.05	-1.36	72.7	-0.51	27.3
(c) High Tariff and Import Restriction Period (1996-2010)					
<u>Paddy/Brown rice</u>	217.43	70.31	80.1	17.43	19.9
<u>Milled/Parboiled Rice</u>	173.62	34.08	75.6	11.02	24.4

As this Table shows, the size of economic benefits varies across the three import restriction regimes and across the two competition levels. In particular, under the tariff only regime during 1970 – 1985, average annual expenditure on paddy/brown rice is ₦0.37 billion while that of milled/parboiled rice is ₦0.34 billion yielding total economic benefits of ₦ 0.06 billion (or 16.22%) and ₦ 0.05 billion (or 14.71%) respectively; out of which ₦ 0.05 billion (or 83.33%) and ₦0.04 billion (or 80.00%) accrued to producers on paddy/brown and milled/parboiled rice respectively. Under the relatively low tariffs plus prohibition regime during 1986 – 1995, however, the total expenditure on paddy/brown rice was ₦23.37 billion while that of milled/parboiled rice totalled ₦6.05 billion. The total economic benefits derived from this in the forms of producers' surplus and government revenue were ₦14.04 billion (or 60.07%) on paddy/brown and that of milled/parboiled rice produces economic costs of ₦1.87 billion (or 30.91%) to both producers and government. Both the producers and government actually experienced costs on the milled/parboiled rice in this regime to the tune of ₦ 1.36 billion and ₦ 0.51 billion respectively. The costs experienced in this period were essentially due to government's deliberate efforts directed at lowering domestic price of rice against the world price.

In the third regime of high tariffs plus prohibition regime during 1996 – 2010, the total expenditure on paddy/brown rice is ₦217.43 billion while that of milled/parboiled rice is ₦173.62 billion. The total economic benefits derived in terms of producers' surplus and government revenue were ₦87.74 billion (or 40.35%) on paddy/brown and ₦45.10 billion (or 25.98%) on milled/parboiled rice. The producers' surplus on paddy/brown was ₦70.31 billion and ₦34.08 on milled/parboiled rice, while ₦17.43 billion on paddy/brown and ₦ 11.02 on milled/parboiled rice accrued to government as revenue.

Thus, the average annual expenditure on paddy/brown is higher than that of milled/parboiled rice for the three regimes. About 37% of the average annual expenditure on paddy/brown and decline of about 2% on milled/parboiled rice under the different regimes accrued to producers while about 5% of the average annual expenditure on paddy/brown and decline of about 2% on milled/parboiled rice under the different regimes accrued to government, with the share of producers being larger than that of government. By comparison, under the tariffs only regime, less than 20% of average annual expenditure on rice was captured in the form of producers' surplus and government revenue. In addition, more than 80% of these economic benefits accrued to producers. It must however be noted that the share of government accrues in two ways, directly and indirectly, directly as import duty revenue, and indirectly through taxing the producers.

7.3. Economic Costs

Table 7.2 shows the direct consumer surplus losses (that is area (a)+(b)+(c)+(d) in Figure 2.3) generated by tariffs-only import restriction regime during 1970 – 1985 and the corresponding losses emanating from the tariff plus prohibition regime during 1986 – 2010. In the case of the tariffs-only import regime, the difference between domestic and foreign prices, induced by tariff barrier, accounted for a loss of ₦0.06 billion (22.85%) on paddy/brown rice and ₦0.06 billion (25.24%) on milled, to rice consumers on their total expenditure of ₦ 0.37 billion and ₦ 0.34 billion respectively. By comparison, for the period of 1986 – 1995 under the relatively low tariff plus prohibition of rice import regime, consumers lost ₦17.62 billion (70.02%) on paddy/brown rice and gained ₦1.07 billion (34.58%) on milled/parboiled rice out of the total expenditure of ₦ 23.37 billion and ₦ 6.05 billion respectively. During the third regime 1996 – 2010 under the high tariff plus prohibition of rice import regime, consumers lost ₦100.02

billion (53.82%) on paddy/brown rice and ₦60.14 billion (28.22%) on milled/parboiled rice out of the total expenditure of ₦ 217.43 billion and ₦ 173.62 billion respectively. In percentage terms, therefore, the tariffs plus prohibition regime imposed on consumers a loss which was higher than that imposed under the tariffs – only regime.

Table 7.2: Direct Consumer Loss

(a) Tariff Restriction Period (1970-1985)	Average Annual Expenditure (N billion)	Average Annual Consumer Loss (N billion)	Average Annual Consumer Loss % of Expenditure
<u>Paddy/Brown rice</u>	0.37	0.06	16.2
<u>Milled/Parboiled Rice</u>	0.34	0.06	17.6
(b) Low Tariff and Import Restriction Period (1986-1995)			
<u>Paddy/Brown rice</u>	23.37	17.62	75.4
<u>Milled/Parboiled Rice</u>	6.05	-1.07	-17.7
(c) High Tariff and Import Restriction Period (1996-2010)			
<u>Paddy/Brown rice</u>	217.43	100.02	46.0
<u>Milled/Parboiled Rice</u>	173.62	60.14	34.6

7.4. Benefit and Cost Comparison: The Deadweight Loss from Protection

All the rice import regimes discussed above are associated with costs and benefits. The summation of the benefits and costs generated under the tariffs – only import regime produces economic benefits on annual average of ₦ 0.06 billion on paddy/brown rice and ₦ 0.056 billion on milled/parboiled rice and the economic costs on annual average of ₦0.063 billion on paddy/brown rice and ₦0.062 billion on milled/parboiled rice, yielding a net welfare loss or deadweight burden of ₦ 0.002 billion on paddy/brown and ₦ 0.006 billion on milled/parboiled rice per annum for the Nigerian economy. A similar exercise with respect to the low tariffs plus prohibition import regime produces a benefit–cost value of ₦3.58 billion per annum on paddy/brown and ₦ 0.80 billion on milled/parboiled rice. While the regime of high tariffs that is combined with import prohibition generates aggregate deadweight loss of ₦ 12.28 billion on paddy/brown and ₦ 15.04 billion on milled/parboiled rice. This result re-confirms the superiority of the tariffs – only regime over both the low and high tariffs regimes that is combined with

import prohibition. In both absolute and relative terms, the former is more efficient than the latter.

As shown in section 2, this net welfare loss arises because trade barriers distort both consumption and production. This deadweight loss is the sum of the production distortion loss (area (b) in Figure 2.3) that arises because the trade barriers induce inefficient domestic high-cost production (i.e. domestic production at a resource cost higher than the cost of importing rice from abroad) and the consumption distortion loss (area (d) in Figure 2.3) that arises because the trade barriers reduce domestic rice consumption below the Pareto-optimal free-trade level. Table 7.3 shows the decomposition of the total dead-weight burden into these two components across the two competition levels.

Table 7.3: Dead-Weight Loss of Import Restrictions

(a) Tariff Restriction Period (1970-1985)	Average Annual Expenditure (N billion)	Average Annual Consumption Distortion Loss	Average Annual Production Distortion Loss	Aggregate Deadweight Loss			
		(N billion)	% of Expenditu re	(N billion)	% of Expenditu re	(N billion)	% of Expenditu re
<u>Paddy/Brown rice</u>	0.37	0.0004	0.11	0.002	1.85	0.002	0.11
<u>Milled/Parboiled Rice</u>	0.34	0.004	1.18	0.002	0.17	0.006	3.53
(b) Low Tariff and Import Restriction Period (1986-1995)							
<u>Paddy/Brown rice</u>	23.37	0.58	2.48	3	120.88	3.580	2.96
<u>Milled/Parboiled Rice</u>	6.05	0.52	8.60	0.28	3.26	0.800	24.56
(c) High Tariff and Import Restriction Period (1996-2010)							
<u>Paddy/Brown rice</u>	217.43	2.12	0.98	10.17	1043.05	12.280	1.18
<u>Milled/Parboiled Rice</u>	173.62	11.31	6.51	3.73	57.26	15.040	26.27

This Table shows that, in both absolute and relative terms, inefficiency costs or dead-weight losses are higher under both the low and high tariffs plus prohibition regimes than with the tariffs – only import restriction regime. In all the regimes, the consumer distortion loss component is much larger than the production distortion loss component while distortion on

domestically produced rice versus imported brown (husked) rice is larger than the distortion that is created with domestically milled/parboiled rice versus imported parboiled rice.

8. Impact of Rice Import Restrictions on the Food Processing Industry

8.1: Introduction

It is well known that rice is a staple food in Nigeria and thus a major input in the food processing industry. Hence, economic theory suggests that when the price of rice increases due to import restrictions, the input costs in the food processing industry increases. This cost increase should lead to a reduction in the output of the food processing industry which could, in turn, result in reduced employment level in the industry.

These relationships are examined in this section. The theoretical framework and methodology presented in section 2 above lays out the procedure for this analysis. More specifically, a translog cost function was estimated to derive the rice price elasticity of food processing cost. This elasticity is 0.58. It implies that a 100% increase in the price of rice causes a 58% increase in the marginal cost of food processing output. The elasticity of food processing output to rice price was also computed at -0.71. Both of these elasticity estimates are used in the analysis of the impact of rice price increase on food processing industry's cost, output and employment. Analyses in this section are presented just for the period of high tariff plus prohibition regime. This is because information on major listed food processing companies are available from 2004. The details of these computations on year-by-year basis are given in appendix 8A.

8.2: Impact of Rice Price on Food Processing Industry Output

The elasticities described above along with equations (25) – (29) are used to simulate the hypothetical food processing industry output levels over the 2004 – 2010 period when consistent data could be obtained on the major listed food processing companies in Nigeria.

Table 8.1: Rice Price and Food processing Industry Output, 2004 – 2010

Year	Ave. annual Rice price change (%)	Ave. annual Actual food processing industry output (N'm)	Ave. annual Hypothetical food processing industry output (N'm)	Ave. annual Output loss (N'm)	Ave. annual Percent loss
2004-2010	102.90	72,941.90	144,933.43	(71,991.53)	(73.06)

According to Table 8.1, as the price of rice rose rapidly during the 2004 – 2010 period, the estimated loss of output in the food processing also climbed sharply. It is observed that the estimated average annual output loss was ₦71.9billion (73.06% of actual output) in the tariff plus prohibition period. This finding therefore underscores the higher costs implication of protection witnessed in this period.

8.3. Impact of Rice Price on Food processing Industry Employment

The impact of rice price change on the level of employment in the food processing industry is computed on the assumption that the output/labour ratio in the food processing industry is constant (see equation 29). The estimated loss of output of the food processing industry shown in Table 8.1 above is used to estimate the associated loss of employment. Table 8.2 shows the summaries for the period analysis.

Table 8.2: Rice Price and Food processing Industry Employment, 2004 – 2010

Year	Ave. annual Rice price change (%)	Ave. annual Actual food processing industry employment	Ave. annual Hypothetical food processing industry employment	Ave. annual Estimated employment loss in the food processing industry
2004-2010	102.90	117,360	233,545	(116,185)

As in the case of output loss in the food processing industry, Table 8.2 shows that rice price increases also resulted in large employment losses in the industry. In this period, of combining

tariff with import prohibition, about 116,185 jobs were lost by the food processing industry on yearly basis. This shows the number of workers that would have been employed if rice were sold at the international price on the Nigerian market.

9. Evaluation of the External Effects of Rice Protection

9.1 *Introduction*

Rice production and processing in Nigeria, just like most economic activities, generates externalities as its by-products. Some of these are positive while others are negative and thus a comprehensive analysis of externalities in rice production must of necessity include negative as well as positive externalities. An explicit analysis of the negative externalities in terms of the environmental degradation and associated socio-economic implications is the focus of this section. This study reasons that because import protection induces a higher level of local production of rice, the external costs of rice production, in terms of the environmental degradation and associated socio-economic implications, will rise. To alleviate the environmental impacts associated with production of rice, firms engage in corporate social responsibility which constitutes the commitment of businesses to contribute to sustainable economic development, working with employees, their families, the local community, and society at large to improve the quality of life, in ways that are good for business and good for development (World Bank, 2004). By so doing, the firms become responsible for the effects of their actions on others (Evan and Freeman, 1993:166 and Henderson, 2001).

This section evaluates the general environmental impact of increased production of rice and the levels and patterns of CSR activities of the major Nigerian rice producers that are, in principle, supposed to alleviate environmental impacts associated with production of rice. Unfortunately, no study has in a systematic way been able to assign monetary values to all the

negative externalities that add to the social costs of increased rice production, limiting analysis to literature review of environmental cost of rice. But the CSR expenditure was analyzed to assess its trend and magnitude and focus. This precludes a complete analysis of the social costs and social benefits of protection.

9.2. Corporate Social Responsibility

There are negative health effects of rice farming as certain diseases are associated with rice production in general. In specific terms, swamp rice farming is associated with warm related disease, waist pain, respiratory-tract infection especially when winnowing and chest pain attributable to smoke inhaled during parboiling activities. The growing and processing chains of rice production have its associated negative effects. For example, weed, pest and disease control as well as bird scaring generate methane and nitrous oxide, damage to eco-system from the use of agro-chemicals, methane and nitrous oxide and damage to human health; Harvesting and threshing create waste management problem and dust particles which cause eyesight and breathing problems; drying and milling also creates electric generator-induced pollutants such as smoke, oxides of carbon, nitrogen, sulphur and petrol and diesel exhaust fumes as well as methane which contributes to destruction of the ozone layer, chemical pollutants are human and ecological health hazards (UNEP 2005).

Rice firms and farms can deal with environmental problems and react positively to them by being socially responsible through their Corporate Social Responsibility (CSR) activities. Table 9.1 below shows the CSR expenditure of a major rice milling and processing company in Nigeria. It is observed that the company spent an average annual value of N257,780 in the period of prohibition plus low tariff which amounted to 0.005% of the company's turnover in the

period. CSR expenditure increased to N6,928,370 in the period of prohibition plus high tariff and this was 0.007% of the company's turnover.

In terms of the distribution of the company's CSR expenditure, it is observed that the company's health/environment CSR expenditure increased from zero to 25% between the two periods while it dropped from 14.4% in the first regime to about 7% in the second in agricultural sector, though the value increased drastically from N37,200 to N484,444 (The year-by-year analysis is contained in appendix 9A).

Table 9.3: Average Annual CSR expenditure and distribution by Flour Mill of Nigeria Plc

Regime	Distributions by segment of the society								
	Total CSR expenditure (N'000)	CSR in Turnover (%)	Agricultural Related (N'000)	Education (N'000)	Health/ Environment (N'000)	Infrastructure/ Industrial (N'000)	Others organisation (N'000)	Social Organisations (N'000)	Staff/ compensation (N'000)
Prohibition +Low tariff	257.78	0.005	37.20	50.00	-	64.60	-	149.58	-
Prohibition + High tariff	6,928.37	0.007	484.44	2,285.48	1,730.00	801.40	2,461.37	800.86	3,382.61
Average Total	6,143.60	0.007	439.72	2,125.80	1,730.00	590.89	2,461.37	719.45	3,382.61

The foregoing therefore shows that increased rice production in Nigeria generates some negative externalities which affect human, other agricultural products and aquatic lives. The corporate social activities of a major rice milling and processing firm in Nigeria, analysed as a case, shows that a relatively very small proportion is allocated to alleviating agricultural- and health-related CSR expenditure.

10. Comprehensive Quantification of the Value of Rice Waivers Granted

10.1 Introduction

This section estimates the value of waivers granted on rice based on available secondary data on rice import quantity and the subsisting tariffs at the time of importation. The estimates are in respect of brown (husked) rice and parboiled rice. The rent per unit received by the privileged importer of rice is conceived as the difference between market price and landed price. In the absence of import ban, it is expected that these two prices should be approximately the same. However, in the event of an import ban combined with import waiver for selected importers, the market price is bound to be higher because the quantity permitted to be imported will be lower than it would have been under freer conditions. This wisdom underpins the value of waivers in respect of rice done in this study.

10.2. Quantification of Waivers

Table 10.1 presents the value of import prohibition waivers obtained by the privileged importers of brown and parboiled rice. Panel (a) of the Table compares domestic price with imported brown rice. It shows that importers gained a “rent” rising from an average of N40 per ton in 1970-85, through N3,907 per ton in 1986-1995 to N6,150 per ton in 1996-2010. In panel (b), the Table a similar trend during 1970-1985 and 1996-2010; over these periods, the rent per ton rose from N94 to N10,422. However, this “rent” was transformed into a subsidy of N1,349 per ton in 1986-1995. During part of this period, rice import licenses were restricted to government parastatals through which public procurement of rice was implemented.

As a proportion of domestic price, the rent on brown rice import rose from 13.2% during 1970-1985, to 57.78% in 1986-1995 before falling to 12.72% in 1995-2010. In the case of imported parboiled rice, the rent was 20.26% of domestic market price during 1970-1985, and 19.46% during 1996-2010. The rent was transformed into a subsidy of 49.02% (of domestic price during 1986-1995).

Table 10.1: Value of Waivers

(a) Domestic Paddy and Imported Brown Rice

	Domestic Price (₱/ton)	Import Landed Price (₱/ton)	Landed Price + Tariff (₱/ton)	Difference (₱/ton)	% of Domestic Price
1970-1985	303	198	263	40	13.20
1986-1995	6,762	2,163	2,855	3,907	57.78
1996-2010	48,353	24,600	42,203	6,150	12.72

(b) Domestic Milled Rice and Imported Parboiled Rice

	Domestic Price (₱/ton)	Import Landed Price (₱/ton)	Landed Price + Tariff (₱/ton)	Difference (₱/ton)	% of Domestic Price
1970-1985	464	296	370	94	20.26
1986-1995	2,752	3,229	4,101	- 1,349	- 49.02
1996-2010	53,506	37,385	63,928	10,422	19.48

Source: Author's Computation based on FAOSAT data

11. Quantification of the Potential Benefits of Tariffication as an Alternative Measure to Import Prohibition

Tariffication is the conversion of non-tariff barriers (NTBs) into bound tariffs. It is done as a means of eliminating the known problems associated with the use of non-tariff barriers. These include instability, lack of predictability and opaqueness. From the economic point of view NTBs are, in many instances, a source of avoidable inefficiencies. They limit the operation of markets much more than tariffs and, therefore, adversely affect the efficiency of a competitive price system (Anderson, 1988; Moschini and Meilke, 1991). While NTBs insulate markets, tariffs provide an explicit link that allows the transmission of price signals across national markets that are geographically separated. Hence, using only tariffs instead of NTBs should

result in more efficient and stable markets. Tariffs provide a more transparent mode of protection whose level is easy to assess and negotiate.

The tariffication of NTBs is not without its challenges; and several approaches have been developed to cope with the difficulties. As further elaborated in the theoretical framework and methodology in section 2 above, the tariff equivalent of the import restriction dealt with in this study is estimated as the difference between the market price of rice and its hypothetical market price that would have prevailed in the absence of the import restriction. The estimated average tariff equivalence of brown rice is 96% and 124% on parboiled rice, import prohibition regime is calculated for the 1986 – 2010 period.

Table 11.1 Tariff Equivalent of a Quota (%)

Tariff and Import Restriction Period (1986-2010)	
<u>Paddy/brown</u>	95.64
<u>Milled/parboiled</u>	124.44

If this tariff equivalent rate had been applied instead of the import prohibition regime, the same level of protection would have been enjoyed by domestic rice producers. But the cost to the economy would have been lower for, at least, three reasons. First, the administrative cost involved in managing the import prohibition regime would have been avoided. Second, the availability of imported rice (or even the threat of it) could have moderated the tendency for high prices. Third, the wasteful lobbying and rent-seeking costs typically associated with the import prohibition regime could have been significantly reduced, if not eliminated.

12. Conclusion and Recommendations

12.1. Introduction

This section contains the main conclusions derived from this study and offers a number of key policy recommendations that are based, in turn, on the conclusion.

12.2. Conclusion

Rice has emerged as one of the fastest growing agricultural sub-sectors as of Nigeria. Nigeria is the largest consumer of rice in Sub-Saharan Africa and the largest rice producer in the West African region. Both production and consumption of rice in Nigeria have vastly increased over the years.

The demand for rice in Nigeria is, however, growing faster than for any other major staple. Consumption of rice has increased across all socio-economic classes, including the poor. Nigerians consume more rice than the economy's domestic production capacity. The gap has been met by importation of the products, making Nigeria the second largest importer of rice in the world.

Successive governments in Nigeria have attempted to reduce the dependence on imported rice and also to develop the local rice industry. A wide range of policy initiatives have been deployed since the early 1970s. A recurrent part of these policy initiatives has been the use of various forms of rice import restrictions. These restrictions have generally not been preceded by - or subsequently been evaluated on the basis of - appropriate quantitative analysis of their impact on local rice production (output, employment), on rice consumers (price), on government revenue, as well as on the economy.

This study has provided quantitative evidence in respect of the impact of rice import restrictive policy initiatives of government in Nigeria. Specifically, the benefit-cost ratio of the

application of import prohibition on rice is found to be negative and larger, in welfare terms, during 1996 – 2010 when the policy of high tariff plus import prohibition was in vogue as compared to 1986-1995 period when low tariffs were combined with import prohibition to protect the rice industry. Both consumption distortion loss and production distortion loss were at the peak when high tariffs were combined with import prohibition for paddy-brown rice as well as milled-parboiled rice. The price of rice during the period 2004-2010 that coincided with the era of high tariffs with prohibition rose rapidly for food processing industry, leaving the industry with more than 70 percent output loss. Employment in the industry also fell during the same era of high tariffs with prohibition. While rice production generates some negative externalities, no evidence is found to support the expectation that corporate social responsibility of firms in rice industry is focused on environmental and health related problems arising from their production activities.

In order to eliminate the challenges that always accompany the use of non-tariff barriers (NTBs), tariff equivalence of 96 percent and 124 percent was estimated for paddy/brown and milled/parboiled rice, respectively against the background of tariffs and import restriction period of 1986-2010.

The study has observed that the design and implementation of the rice import prohibition policy constitute outright violation of Nigeria's commitment to global and even regional trade agreements. While the Nigerian government has always requested for time to phase it out in an orderly manner, the process of granting import prohibition waivers for rice has been criticised for being opaque, secret, discriminatory and liable to corruption.

12.3 Recommendations

In view of the fact that the rice industry is a producer of a critical staple food for Nigerian populace and whose growth is important for overall economic performance and poverty alleviation, the various necessary government supports to the industry must be properly fine-tuned. This is germane in order to eliminate likely negative consequences that such policy interventions may transfer to the people and forward linkage industry like food processing.

Given the direct and indirect negative impacts of rice import restrictions, it appears clear that import restriction, whether in the form of high import duties or through import prohibition cannot be regarded as an appropriate policy instrument for promoting domestic production of rice. Food security requires that adequate food be available to all at affordable price. Since import restriction inevitably leads to high prices and reduced supply and consumption which, in turn, result in consumer welfare loss, the use of import restriction is bound to either frustrate the achievement of food security or at least be in conflict with it.

Import restrictions on rice have focused largely on the demand side, playing down the required governmental attention on supply. Government needs to focus more on supply-enhancing policy initiatives in favour of local production. Production barriers limiting large scale production of rice as well as milling capacity of domestic rice mills should be confronted by appropriate policies.

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Appendices

Appendix 2A: Data used for the calibration of the welfare costs and benefits

	Domestic Paddy Rice Vs Imported Brown Rice						
Year	Import Quantity of Brown Rice (Tonnes)	Value of Imported Brown Rice (N)	Price of Imported Brown Rice (N/Tonne)	Domestic Paddy Production (Tonnes)	Value of Domestic Paddy Production (N)	Domestic Paddy PRICE (N/Tonne)	Applied Tariff on Brown
1970	6,000.00	311,761.34	51.96	343,000.00	46,648,000.00	136.00	66.60%
1971	11,000.00	1,399,747.25	127.25	388,000.00	67,512,000.00	174.00	66.60%
1972	2,000.00	251,454.07	125.73	447,000.00	78,672,000.00	176.00	66.60%
1973	4,000.00	667,368.84	166.84	487,000.00	93,017,000.00	191.00	66.60%
1974	6,000.00	1,252,361.74	208.73	525,000.00	105,000,000.00	200.00	66.60%
1975	94,000.00	22,525,177.72	239.63	504,000.00	105,840,000.00	210.00	20.00%
1976	446,000.00	132,589,214.56	297.29	218,000.00	50,140,000.00	230.00	10.00%
1977	789,000.00	198,770,956.83	251.93	408,000.00	97,920,000.00	240.00	10.00%
1978	242,000.00	53,429,119.45	220.78	515,000.00	123,600,000.00	240.00	19.00%
1979	394,000.00	70,231,796.97	178.25	750,000.00	246,750,000.00	329.00	19.00%
1980	686,000.00	136,719,373.79	199.30	1,090,000.00	358,610,000.00	329.00	19.00%
1981	666,000.00	168,892,152.17	253.59	1,241,000.00	496,400,000.00	400.00	19.00%
1982	903,000.00	218,909,550.97	242.42	1,250,000.00	500,000,000.00	400.00	19.00%
1983	629,000.00	133,512,738.89	212.26	1,280,000.00	512,000,000.00	400.00	19.00%
1984	569,000.00	131,827,636.74	231.68	1,300,000.00	650,000,000.00	500.00	19.00%
1985	462,000.00	73,455,468.84	158.99	1,430,000.00	1,001,000,000.00	700.00	19.00%
1986	642,000.00	217,282,532.63	338.45	1,416,320.00	1,373,830,400.00	970.00	19.00%
1987	344,000.00	212,992,694.93	619.16	1,780,000.00	2,518,700,000.00	1,415.00	19.00%
1988	164,000.00	137,086,471.13	835.89	2,081,000.00	4,723,870,000.00	2,270.00	27.50%
1989	224,000.00	295,820,019.91	1,320.63	3,303,000.00	9,380,520,000.00	2,840.00	27.50%

1990	296,000.00	426,979,861.25	1,442.50	2,500,000.00	14,025,000,000.00	5,610.00	27.50%
1991	440,000.00	838,892,034.40	1,906.57	3,226,000.00	24,336,944,000.00	7,544.00	27.50%
1992	382,000.00	1,214,361,296.78	3,178.96	3,260,000.00	41,095,560,000.00	12,606.00	27.50%
1993	300,000.00	1,152,388,308.50	3,841.29	3,065,000.00	57,560,700,000.00	18,780.00	22.50%
1994	300,000.00	1,256,887,457.14	4,189.62	2,427,000.00	29,852,100,000.00	12,300.00	22.50%
1995	350,000.00	1,385,718,421.50	3,959.20	2,920,000.00	41,697,600,000.00	14,280.00	100.00%
1996	731,000.00	4,033,256,658.78	5,517.45	3,122,000.00	80,672,480,000.00	25,840.00	50.00%
1997	900,000.00	4,965,725,817.11	5,517.47	3,268,000.00	82,615,040,000.00	25,280.00	50.00%
1998	950,000.00	5,241,560,910.24	5,517.43	3,275,000.00	104,636,250,000.00	31,950.00	50.00%
1999	1,250,000.00	22,741,217,291.83	18,192.97	3,277,000.00	88,577,310,000.00	27,030.00	50.00%
2000	1,906,000.00	34,363,323,998.54	18,029.03	3,298,000.00	93,709,372,000.00	28,414.00	50.00%
2001	1,897,000.00	26,325,219,800.03	13,877.29	2,752,000.00	103,144,960,000.00	37,480.00	85.00%
2002	1,448,000.00	21,614,602,912.33	14,927.21	2,928,000.00	133,370,400,000.00	45,550.00	100.00%
2003	1,369,000.00	24,914,804,824.72	18,199.27	3,116,000.00	119,124,680,000.00	38,230.00	100.00%
2004	1,777,000.00	35,261,252,885.21	19,843.14	3,334,000.00	153,930,780,000.00	46,170.00	100.00%
2005	1,600,000.00	43,060,331,860.04	26,912.71	3,567,000.00	255,218,850,000.00	71,550.00	110.00%
2006	1,550,000.00	40,466,376,293.57	26,107.34	4,042,000.00	266,198,036,000.00	65,858.00	110.00%
2007	1,800,000.00	59,948,201,600.52	33,304.56	3,186,000.00	175,911,804,000.00	55,214.00	100.00%
2008	2,000,000.00	126,169,081,064.29	63,084.54	4,179,000.00	314,001,702,000.00	75,138.00	50.00%
2009	2,000,000.00	125,198,485,789.06	62,599.24	3,546,250.00	284,571,982,614.47	80,245.89	30.00%
2010	2,550,000.00	112,421,935,684.29	44,087.03	4,472,520.00	319,101,357,079.05	71,347.11	30.00%

Appendix 2A: Data used for the calibration of the welfare costs and benefits (Cont'd)

	Domestically Milled Rice Vs Imported Parboiled Rice						
	Import Quantity of Parboiled Rice (Tonnes)	Value of Imported Parboiled Rice (N)	Price of Imported Parboiled Rice (N/Tonne)	Domestic Milled Rice (Tonnes)	Value of Domestic Milled Rice (N)	Price of Domestic Milled Rice (N/Tonne)	Applied Tariff on Parboiled Rice
1970	1,750.00	135,717.00	77.55	228,670.00	68,463,100.00	299.40	66.60%
1971	260.00	49,380.50	189.93	258,670.00	81,569,290.00	315.34	66.60%
1972	5,890.00	1,105,272.00	187.65	298,000.00	78,342,190.00	262.89	66.60%
1973	1,070.00	266,449.50	249.02	324,670.00	77,943,140.00	240.07	66.60%
1974	4,810.00	1,498,472.63	311.53	350,000.00	95,182,044.06	271.95	66.60%
1975	6,650.00	2,378,412.70	357.66	336,000.00	128,858,797.00	383.51	20.00%
1976	45,380.00	20,135,528.27	443.71	145,330.00	142,727,693.00	982.09	10.00%
1977	413,270.00	155,394,270.72	376.01	272,000.00	176,855,143.00	650.20	10.00%
1978	563,850.00	185,802,448.50	329.52	343,330.00	174,657,592.00	508.72	19.00%
1979	567,900.00	151,089,618.53	266.05	500,000.00	192,499,638.00	385.00	19.00%
1980	450,000.00	133,857,791.67	297.46	726,670.00	229,271,922.00	315.51	19.00%
1981	656,790.00	248,591,897.78	378.50	827,330.00	350,053,600.00	423.11	19.00%
1982	539,440.00	195,184,489.80	361.83	833,330.00	391,207,800.00	469.45	19.00%
1983	543,530.00	172,195,095.20	316.81	853,330.00	446,589,000.00	523.35	19.00%
1984	365,000.00	126,215,375.00	345.80	866,670.00	587,124,000.00	677.45	19.00%
1985	356,140.00	84,513,893.75	237.31	953,330.00	684,596,300.00	718.11	19.00%
1986	320,000.00	161,646,000.00	505.14	944,210.00	709,337,400.00	751.25	19.00%
1987	400,000.00	369,650,633.33	924.13	1,186,670.00	1,083,125,800.00	912.74	19.00%
1988	200,000.00	249,520,333.33	1,247.60	1,387,330.00	1,689,161,300.00	1,217.56	20.00%

1989	300,000.00	591,324,666.67	1,971.08	2,202,000.00	1,963,236,821.00	891.57	20.00%
1990	224,000.00	482,268,500.00	2,152.98	1,666,670.00	2,374,059,837.00	1,424.43	20.00%
1991	296,000.00	842,306,791.67	2,845.63	2,150,670.00	2,776,070,094.00	1,290.79	20.00%
1992	350,000.00	1,660,648,800.00	4,744.71	2,173,330.00	4,188,987,817.00	1,927.45	20.00%
1993	350,000.00	2,006,646,308.33	5,733.28	2,043,330.00	6,805,842,513.00	3,330.76	15.00%
1994	350,000.00	2,188,610,000.00	6,253.17	1,618,000.00	10,304,746,225.00	6,368.82	15.00%
1995	300,000.00	1,772,774,100.00	5,909.25	1,946,670.00	18,303,361,333.00	9,402.40	100.00%
1996	345,500.00	2,845,193,000.00	8,235.00	2,081,330.00	24,768,377,670.00	11,900.26	50.00%
1997	699,050.00	5,756,700,883.00	8,235.03	2,178,670.00	28,029,263,325.00	12,865.31	50.00%
1998	594,060.00	4,892,068,616.40	8,234.97	2,183,330.00	30,954,227,302.00	14,177.53	50.00%
1999	812,450.00	22,061,017,300.00	27,153.69	2,184,670.00	32,901,950,100.00	15,060.38	50.00%
2000	785,750.00	21,143,742,331.25	26,908.99	2,198,670.00	34,702,409,915.00	15,783.36	50.00%
2001	1,770,080.00	36,662,558,370.75	20,712.37	1,834,670.00	46,420,499,979.00	25,301.83	85.00%
2002	1,236,420.00	27,546,721,502.50	22,279.42	1,952,000.00	105,843,448,409.00	54,223.08	100.00%
2003	1,600,700.00	43,479,964,766.67	27,163.09	2,077,330.00	113,657,393,934.00	54,713.21	100.00%
2004	1,398,290.00	41,412,625,082.40	29,616.62	2,222,670.00	120,689,945,427.00	54,299.53	100.00%
2005	1,187,790.00	47,711,410,056.00	40,168.22	2,378,000.00	146,721,393,728.00	61,699.49	110.00%
2006	975,910.00	38,027,483,186.00	38,966.18	2,694,670.00	183,619,182,076.00	68,141.62	110.00%
2007	1,216,960.00	60,493,004,494.00	49,708.29	2,124,000.00	209,046,020,700.00	98,420.91	100.00%
2008	971,820.00	91,502,713,701.42	94,156.03	2,786,000.00	246,883,350,329.47	88,615.70	50.00%
2009	1,164,340.00	108,786,272,345.99	93,431.71	2,364,170.00	284,571,982,614.47	120,368.66	30.00%
2010	1,885,330.00	124,057,622,478.00	65,801.54	2,981,680.00	319,101,357,079.05	107,020.66	30.00%

Appendix 7A: The Costs and Benefits of Rice Import Prohibition (Detailed year-by-year Analysis)

Year	Form of Restriction	Domestically Paddy Rice VS Imported Brown Rice							As a % of Expenditure					
		Expenditure (N'm)	CL (N'm)	CDL (N'm)	PDL (N'm)	Harberger loss(N'm)	PG (N'm)	GG (N'm)	CL	CDL	PDL	Harberger loss	PG	GG
1970	Tariff Only	46.96	19.01	0.24	1.47	1.71	17.18	0.12	40.48	0.51	3.13	3.64	36.58	0.27
1971	Tariff Only	68.91	27.90	0.35	2.13	2.48	24.86	0.56	40.48	0.51	3.09	3.59	36.08	0.81
1972	Tariff Only	78.92	31.95	0.40	2.48	2.88	28.97	0.10	40.48	0.51	3.14	3.65	36.71	0.13
1973	Tariff Only	93.68	37.93	0.47	2.93	3.40	34.25	0.27	40.48	0.51	3.13	3.63	36.56	0.28
1974	Tariff Only	106.25	43.01	0.54	3.31	3.85	38.67	0.50	40.48	0.51	3.11	3.62	36.39	0.47
1975	Tariff Only	128.37	21.49	0.10	0.52	0.62	17.12	3.75	16.74	0.07	0.41	0.48	13.33	2.92
1976	Tariff Only	182.73	16.65	0.04	0.07	0.11	4.49	12.05	9.11	0.02	0.04	0.06	2.46	6.60
1977	Tariff Only	296.69	27.04	0.06	0.14	0.20	8.76	18.07	9.11	0.02	0.05	0.07	2.95	6.09
1978	Tariff Only	177.03	28.39	0.12	0.56	0.68	19.17	8.53	16.03	0.07	0.32	0.38	10.83	4.82
1979	Tariff Only	316.98	50.83	0.22	1.12	1.33	38.28	11.21	16.03	0.07	0.35	0.42	12.08	3.54
1980	Tariff Only	495.33	79.42	0.34	1.63	1.96	55.63	21.83	16.03	0.07	0.33	0.40	11.23	4.41
1981	Tariff Only	665.29	106.68	0.45	2.25	2.70	77.01	26.97	16.03	0.07	0.34	0.41	11.57	4.05
1982	Tariff Only	718.91	115.28	0.49	2.27	2.76	77.57	34.95	16.03	0.07	0.32	0.38	10.79	4.86
1983	Tariff Only	645.51	103.51	0.44	2.32	2.76	79.43	21.32	16.03	0.07	0.36	0.43	12.30	3.30
1984	Tariff Only	781.83	125.36	0.53	2.95	3.48	100.84	21.05	16.03	0.07	0.38	0.45	12.90	2.69
1985	Tariff Only	1074.46	172.29	0.73	4.54	5.27	155.29	11.73	16.03	0.07	0.42	0.49	14.45	1.09
	Period Average 1970-1985	367.37	62.92	0.35	1.92	2.26	48.59	12.06	22.85	0.20	1.18	1.38	18.58	2.90
1986	Tariff (Low) + Ban	1591.11	1063.38	27.43	133.27	160.69	761.22	141.47	66.83	1.72	8.38	10.10	47.84	8.89
1987	Tariff (Low) + Ban	2731.69	1568.13	31.75	171.75	203.50	1244.84	119.79	57.41	1.16	6.29	7.45	45.57	4.39
1988	Tariff (Low) + Ban	4860.96	3148.02	77.04	425.49	502.53	2558.89	86.61	64.76	1.58	8.75	10.34	52.64	1.78
1989	Tariff (Low) + Ban	9676.34	5275.72	98.96	569.21	668.17	4449.29	158.26	54.52	1.02	5.88	6.91	45.98	1.64

1990	Tariff (Low) + Ban	14451.98	11105.34	369.40	1908.74	2278.14	8510.01	317.19	76.84	2.56	13.21	15.76	58.88	2.19
1991	Tariff (Low) + Ban	25175.84	19469.05	655.83	3365.13	4020.95	14821.21	626.88	77.33	2.60	13.37	15.97	58.87	2.49
1992	Tariff (Low) + Ban	42309.92	32745.07	1104.78	5693.63	6798.41	25038.54	908.13	77.39	2.61	13.46	16.07	59.18	2.15
1993	Tariff (Low) + Ban	58713.09	48592.17	1888.37	9461.70	11350.07	36325.43	916.68	82.76	3.22	16.12	19.33	61.87	1.56
1994	Tariff (Low) + Ban	31108.99	21068.43	555.79	2988.27	3544.05	16695.61	828.77	67.72	1.79	9.61	11.39	53.67	2.66
1995	Tariff (Low) + Ban	43083.32	32148.33	1010.06	5276.32	6286.38	24860.43	1001.52	74.62	2.34	12.25	14.59	57.70	2.32
	Period Average 1986-1995	23370.32	17618.36	581.94	2999.35	3581.29	13526.55	510.53	70.02	2.06	10.73	12.79	54.22	3.01
1996	Tariff (High) + Ban	84705.74	69236.92	2617.86	12840.33	15458.19	50606.67	3172.06	81.74	3.09	15.16	18.25	59.74	3.74
1997	Tariff (High) + Ban	87580.77	71116.68	2650.80	12928.37	15579.17	51655.57	3881.93	81.20	3.03	14.76	17.79	58.98	4.43
1998	Tariff (High) + Ban	109877.81	94987.70	4084.64	19292.68	23377.32	67273.98	4336.40	86.45	3.72	17.56	21.28	61.23	3.95
1999	Tariff (High) + Ban	111318.53	36750.27	356.46	1803.53	2159.99	27155.40	7434.88	33.01	0.32	1.62	1.94	24.39	6.68
2000	Tariff (High) + Ban	128072.70	47336.57	527.55	2427.24	2954.79	31822.40	12559.38	36.96	0.41	1.90	2.31	24.85	9.81
2001	Tariff (High) + Ban	129470.18	83566.52	2033.78	9217.96	11251.74	55736.70	16578.08	64.54	1.57	7.12	8.69	43.05	12.80
2002	Tariff (High) + Ban	154985.00	107122.01	2927.22	14014.75	16941.96	75648.78	14531.27	69.12	1.89	9.04	10.93	48.81	9.38
2003	Tariff (High) + Ban	144039.48	76867.61	1397.67	6888.38	8286.05	55527.36	13054.19	53.37	0.97	4.78	5.75	38.55	9.06
2004	Tariff (High) + Ban	189192.03	110159.11	2278.82	10841.80	13120.62	76931.97	20106.52	58.23	1.20	5.73	6.94	40.66	10.63
2005	Tariff (High) + Ban	298279.18	190651.29	4566.38	22293.04	26859.42	136928.19	26863.68	63.92	1.53	7.47	9.00	45.91	9.01
2006	Tariff (High) + Ban	306664.41	189389.54	4292.62	21466.57	25759.20	139205.60	24424.75	61.76	1.40	7.00	8.40	45.39	7.96
2007	Tariff (High) + Ban	235860.01	94765.14	1173.63	5452.12	6625.75	64351.37	23788.02	40.18	0.50	2.31	2.81	27.28	10.09
2008	Tariff (High) + Ban	440170.78	70914.94	303.79	1437.03	1740.82	48934.38	20239.74	16.11	0.07	0.33	0.40	11.12	4.60
2009	Tariff (High) + Ban	409770.47	90663.08	551.62	2504.94	3056.57	60074.47	27532.04	22.13	0.13	0.61	0.75	14.66	6.72

2010	Tariff (High) + Ban	431523.29	166842.69	1967.67	9104.10	11071.76	112817.12	42953.81	38.66	0.46	2.11	2.57	26.14	9.95
	Period Average 1996-2010	217434.03	100024.67	2115.37	10167.52	12282.89	70311.33	17430.45	53.82	1.35	6.50	7.85	38.05	7.92

Note: CL = consumer loss and this also equals the Tullock/Posner loss (T/P) when it is assumed that both the producer and the government gains will be wasted on unproductive lobbying and administration; CDL =consumption distortion loss; PDL=production distortion loss; Harberger loss is the addition of the CDL and PDL; PG=producer gain and GG is the government's revenue from tariff or rent from quota.

Appendix 7A: The Costs and Benefits of Rice Import Prohibition (Detailed year-by-year Analysis) –Cont'd

	Domestically Milled Rice VS Imported Parboiled Rice								As a % of Expenditure					
Year	Form of Restriction	Expend (N'm)	CL (N'm)	CDL (N'm)	PDL (N'm)	Harberger loss(N'm)	PG (N'm)	GG (N'm)	CL	CDL	PDL	Harberger loss	PG	GG
1970	Tariff Only	68.60	32.00	4.57	2.02	6.59	25.35	0.05	46.64	6.67	2.95	9.61	36.95	0.08
1971	Tariff Only	81.62	38.07	5.44	2.41	7.85	30.20	0.02	46.64	6.67	2.95	9.62	37.00	0.02
1972	Tariff Only	79.45	37.06	5.30	2.31	7.61	29.01	0.44	46.64	6.67	2.91	9.58	36.51	0.56
1973	Tariff Only	78.21	36.48	5.21	2.30	7.52	28.86	0.11	46.64	6.67	2.94	9.61	36.90	0.14
1974	Tariff Only	96.68	45.10	6.45	2.81	9.26	35.24	0.60	46.64	6.67	2.91	9.57	36.45	0.62
1975	Tariff Only	131.24	23.06	1.18	0.60	1.78	20.88	0.40	17.57	0.90	0.45	1.36	15.91	0.30
1976	Tariff Only	162.86	15.21	0.41	0.19	0.60	12.78	1.83	9.34	0.25	0.12	0.37	7.85	1.12
1977	Tariff Only	332.25	31.04	0.83	0.24	1.07	15.84	14.13	9.34	0.25	0.07	0.32	4.77	4.25
1978	Tariff Only	360.46	60.52	2.97	0.74	3.71	27.15	29.67	16.79	0.82	0.20	1.03	7.53	8.23
1979	Tariff Only	343.59	57.69	2.83	0.81	3.64	29.92	24.12	16.79	0.82	0.24	1.06	8.71	7.02
1980	Tariff Only	363.13	60.97	2.99	0.97	3.96	35.64	21.37	16.79	0.82	0.27	1.09	9.81	5.89
1981	Tariff Only	598.65	100.51	4.93	1.48	6.41	54.41	39.69	16.79	0.82	0.25	1.07	9.09	6.63
1982	Tariff Only	586.39	98.45	4.83	1.65	6.48	60.81	31.16	16.79	0.82	0.28	1.11	10.37	5.31
1983	Tariff Only	618.78	103.89	5.09	1.89	6.98	69.41	27.49	16.79	0.82	0.31	1.13	11.22	4.44
1984	Tariff Only	713.34	119.76	5.87	2.48	8.35	91.26	20.15	16.79	0.82	0.35	1.17	12.79	2.83

1985	Tariff Only	769.11	129.13	6.33	2.90	9.23	106.41	13.49	16.79	0.82	0.38	1.20	13.84	1.75
	Period Average 1970-1985	336.52	61.81	4.08	1.61	5.69	42.07	14.05	25.24	2.58	1.10	3.68	18.48	3.07
1986	Tariff (Low) + Ban	870.98	321.12	35.79	13.57	49.37	218.80	52.95	36.87	4.11	1.56	5.67	25.12	6.08
1987	Tariff (Low) + Ban	1452.78	-18.05	0.06	0.03	0.09	-13.53	-4.61	-1.24	0.00	0.00	0.01	-0.93	-0.32
1988	Tariff (Low) + Ban	1938.68	-47.50	0.33	0.16	0.49	-41.83	-6.16	-2.45	0.02	0.01	0.03	-2.16	-0.32
1989	Tariff (Low) + Ban	2554.56	-2535.16	557.90	335.01	892.92	-2712.10	-715.98	-99.24	21.84	13.11	34.95	-106.17	-28.03
1990	Tariff (Low) + Ban	2856.33	-1309.11	151.81	83.80	235.61	-1298.05	-246.66	-45.83	5.31	2.93	8.25	-45.44	-8.64
1991	Tariff (Low) + Ban	3618.38	-3574.61	783.94	469.38	1253.32	-3813.33	-1014.61	-98.79	21.67	12.97	34.64	-105.39	-28.04
1992	Tariff (Low) + Ban	5849.64	-6847.18	1702.94	997.18	2700.13	-7120.02	-2427.29	-117.05	29.11	17.05	46.16	-121.72	-41.49
1993	Tariff (Low) + Ban	8812.49	-5518.01	838.54	454.80	1293.34	-5363.93	-1447.42	-62.62	9.52	5.16	14.68	-60.87	-16.42
1994	Tariff (Low) + Ban	12493.36	228.03	1.18	0.54	1.71	186.58	39.74	1.83	0.01	0.00	0.01	1.49	0.32
1995	Tariff (Low) + Ban	20076.14	8575.40	1116.77	460.02	1576.79	6339.99	658.62	42.71	5.56	2.29	7.85	31.58	3.28
	Period Average 1986-1995	6,052.33	(1,072.51)	518.93	281.45	800.38	(1,361.74)	(511.14)	(34.58)	9.71	5.51	15.22	(38.45)	(11.36)
1996	Tariff (High) + Ban	27613.57	9486.31	981.37	415.17	1396.54	7213.46	876.32	34.35	3.55	1.50	5.06	26.12	3.17
1997	Tariff (High) + Ban	33785.96	13899.20	1739.50	657.37	2396.87	9430.47	2071.86	41.14	5.15	1.95	7.09	27.91	6.13
1998	Tariff (High) + Ban	35846.30	17718.56	2693.47	1014.43	3707.90	11960.14	2050.53	49.43	7.51	2.83	10.34	33.37	5.72
1999	Tariff (High) + Ban	54962.97	-37893.28	6241.38	2676.51	8917.89	-29096.41	-17714.76	-68.94	11.36	4.87	16.23	-52.94	-32.23

2000	Tariff (High) + Ban	55846.15	-34251.22	5114.50	2222.81	7337.31	-26684.40	-14904.14	-61.33	9.16	3.98	13.14	-47.78	-26.69
2001	Tariff (High) + Ban	83083.06	15970.73	900.45	255.65	1156.10	8164.48	6650.15	19.22	1.08	0.31	1.39	9.83	8.00
2002	Tariff (High) + Ban	133390.17	104177.91	25595.69	7576.10	33171.79	54777.92	16228.20	78.10	19.19	5.68	24.87	41.07	12.17
2003	Tariff (High) + Ban	157137.36	98284.16	19159.72	5632.08	24791.80	51598.60	21893.76	62.55	12.19	3.58	15.78	32.84	13.93
2004	Tariff (High) + Ban	162102.57	88704.24	15017.35	4740.65	19758.01	50121.32	18824.92	54.72	9.26	2.92	12.19	30.92	11.61
2005	Tariff (High) + Ban	194432.80	77142.82	9291.60	3218.18	12509.78	47983.19	16649.85	39.68	4.78	1.66	6.43	24.68	8.56
2006	Tariff (High) + Ban	221646.67	112482.86	17582.87	6308.62	23891.49	72309.57	16281.81	50.75	7.93	2.85	10.78	32.62	7.35
2007	Tariff (High) + Ban	269539.03	164756.13	31350.01	9958.24	41308.25	93507.36	29940.51	61.13	11.63	3.69	15.33	34.69	11.11
2008	Tariff (High) + Ban	338386.06	-20800.49	355.69	147.89	503.58	-15583.24	-5720.83	-6.15	0.11	0.04	0.15	-4.61	-1.69
2009	Tariff (High) + Ban	393358.25	94788.58	6760.07	2427.29	9187.36	61256.26	24344.97	24.10	1.72	0.62	2.34	15.57	6.19
2010	Tariff (High) + Ban	443158.98	197619.70	26936.57	8677.81	35614.38	114224.40	47780.92	44.59	6.08	1.96	8.04	25.78	10.78
	Period Average 1996-2010	173,619.33	60,139.08	11,314.68	3,728.59	15,043.27	34,078.87	11,016.94	28.22	7.38	2.56	9.94	15.34	2.94

Note: CL = consumer loss and this also equals the Tullock/Posner loss (T/P) when it is assumed that both the producer and the government gains will be wasted on unproductive lobbying and administration; CDL =consumption distortion loss; PDL=production distortion loss; Harberger loss is the addition of the CDL and PDL; PG=producer gain and GG is the government's revenue from tariff or rent from quota.

Appendix 8A: Impact of Rice Import Restriction on Food Processing Industry (Detailed year-by-year Analysis)

Year	Annual Actual Food Processing Industry Output	Annual Rice price change (%)	Annual Output Loss	Annual Percent Loss	Annual Hypothetical Food Processing Industry Output	Actual Food Processing Employment	Annual Hypothetical Food Processing industry employment	Annual Estimated employment loss in Food Processing
2004	35,249,770,000.00	22.22805989	(5,563,091,391.10)	(15.78)	40,812,861,391.10	62,668	72,558.63	(9,890.27)
2005	46,080,040,000.00	2.401492073	(785,692,040.65)	(1.71)	46,865,732,040.65	79,436	80,790.76	(1,354.44)
2006	57,611,870,000.00	16.58229206	(6,782,891,665.33)	(11.77)	64,394,761,665.33	97,510	108,990.18	(11,480.26)
2007	72,839,430,000.00	31.99819602	(16,548,185,551.67)	(22.72)	89,387,615,551.67	98,073	120,354.42	(22,281.02)
2008	86,058,679,822.27	87.59701033	(53,523,229,766.57)	(62.19)	139,581,909,588.83	140,376	227,680.87	(87,305.12)
2009	98,961,714,481.43	296.9199965	(208,624,354,614.07)	(210.81)	307,586,069,095.50	166,985	519,010.28	(352,025.65)
2010	113,791,814,051.27	262.5417638	(212,113,235,334.72)	(186.40)	325,905,049,385.99	176,474	505,430.03	(328,955.93)
Period Average	72,941,902,622.14	102.90	(71,991,525,766.30)	-73.06	144,933,428,388.44	117,360	233,545.02	(116,184.67)

Appendix 9A: Evaluation of External Effects of Rice Import Restriction (Detailed year-by-year Analysis)

YEAR	Total CSR Expenditure	CSR in Turnover (%)	Agriculture-Related	Education	Health/Environment	Infrastructure /Industrial	others	Social Organisations	Staff Related
1994	146,400	0.002	37,200			9,200		100,000	
1995	369,150	0.008		50,000		120,000		199,150	
1996	94,000	0.001				82,000		12,000	
1997	226,200	0.002	80,000	76,200			20,000	50,000	
1998	170,000	0.001	50,000	75,000				45,000	
1999	720,000	0.003		400,000	75,000		150,000	95,000	
2000	10,000	0.000						10,000	
2001	75,000	0.000		75,000					
2002	8,020,000	0.019	230,000	675,000	4,235,000		2,800,000	80,000	
2003	1,303,360	0.003	200,000	150,000	265,000		638,360	50,000	
2004	12,870,000	0.024		12,025,000	215,000		50,000	80,000	500,000
2005	2,475,000	0.004		100,000		75,000		650,000	1,650,000
2006	2,900,000	0.003	150,000	800,000	500,000			1,050,000	400,000
2007	15,733,060	0.015	300,000	750,000	700,000		10,000,000	120,000	3,863,060
2008	19,930,000	0.016	1,450,000	2,600,000	2,780,000	1,100,000	500,000	1,000,000	10,500,000
2009	20,219,000	0.011	400,000	4,235,000	5,250,000	750,000	3,634,000	5,950,000	
2010	19,180,000	0.009	1,500,000	7,750,000	1,550,000	2,000,000	4,360,000	2,020,000	
Total	119,611,170		5,447,200	39,761,200	17,020,000	4,686,200	23,172,360	12,611,150	16,913,060

INTERVIEW QUESTIONS ON THE STUDY OF IMPACT OF NIGERIA'S RICE IMPORT RESTRICTIONS

(1) Analysis of the operation of the rice import restrictions, including full record of waivers granted if any

Questions for Public Sector Stakeholders (Government)

- What is the / are the rationale/s for rice import restrictions?
- What is the/are the rationale/s for the granting of waivers and concessions on importation of rice (to few firms)?
- How are restrictions on rice importation determined?
- How is ban on importation of rice imposed and administered?
- What criteria inform the ban on rice? Who decides? Are all relevant stakeholders involved, or is crucial input missing?
- To what extent have policy decisions been taken to transform, strengthen or phase out current import restrictions?
- Which role does import substitution play in government policy thinking today, as contrasted to broader industrial/agricultural policy design?
- Does the government envisage a gradual transition, or rather a more radical move to eliminate restrictions/ban on rice importation?
- To what extent have import restrictions on rice been effective and necessary in the past?
- To which extent are ban on imported rice effective/needed?
- To what extent are alternative measures, such as tariffs, subsidies or more indirect measures, being considered?
- Is there a standardised policy on how waivers and concessions are granted on importation of rice? Why is the outcome of granting waivers and concessions not usually made public?
- Is there a standardised way of measuring or determining import quotas? If not why? Or do you rely completely on private sector information?
- Can you make available the records on prohibition/waivers on rice and is public access to these being considered?

Questions for Private Sector Stakeholders (Firms)

- What is the / are the rationale/s for ban on imported rice?
- Do you agree with the rationale/s? Explain why?
- How can private sector input into decision-making be optimized?
- To what extent has the ban on imported rice been effective? What has been the impact of the removal/addition of ban on rice importation on production and sales?

- Is the ban on imported rice desirable in the future from a business perspective?
- What alternatives could work for Nigerian businesses? e.g. tariff
- What impact does the granting of waivers and concessions on importation of rice (to few firms) have on businesses?

Questions for Civil Society Stakeholders (Individuals)

- What is the / are the rationale/s for ban on rice importation?
- Do you agree with the rationale/s?
- How can civil society input into decision-making be optimized?
- To what extent are consumers negatively affected by the ban/restrictions (in whatever form) on imported rice?
- To what extent are other areas of public concern affected (e.g. supply shortages of inputs, higher prices or both)?
- What impact does the granting of waivers and concessions on importation of rice (to few firms) have on consumers?

(2) Comprehensive quantification of the total economic benefits, i.e. the value of the protection for the rice industry, ideally separating the value accruing to capital holders (owners) and the added value accruing to workers (including job creation/job security).

Questions for Public Sector Stakeholders (Government)

- To what extent have import restrictions on rice affected government revenue? Has this impacted on the provision of social amenities?
- What are the actual (or estimated) benefits of the import restrictions on rice industry?
- To what extent have import restrictions on rice impacted on government ability to provide social services? What of employment?

Questions for Private Sector Stakeholders (Firms)

- To what extent have import restrictions on rice impacted on firms' productivity and profitability?
- Have the import restrictions on rice increased the number of people employed in the industry?
- What are the actual (or estimated) benefits of the import restrictions on rice industry?
- Is there any other potential benefit that protection can yield (e.g. job security, increased expertise, corporate social responsibility etc)? Provide some indication from your records/experience?

Questions for Civil Society Stakeholders (Individuals)

- To what extent have the import restrictions on rice yielded additional employment?
- Is there any other potential benefit that protection can yield to consumers (e.g. job security, increased expertise, corporate social responsibility etc)?
- To what extent have the import restrictions on rice impacted on product quality?

(3) Comprehensive quantification of the total economic costs to Nigeria's economy associated with the import restriction, including:

- **Direct price gap losses to consumers**
- **Impact of restriction on the Nigeria fast food industry including costs, growth of the industry and employment created by the industry.**
- **Medium-/long-term inefficiencies**

Questions for Public Sector Stakeholders (Government)

- To what extent have the import restrictions on rice impacted on the government expenditure on construction? What of provision of social services?
- How have the import restrictions affected the quality of rice? What of government programmes (e.g. poverty alleviation or housing for all etc)?
- What impacts do import restrictions have on the environment?
- What other medium/long term inefficiencies do you think import restrictions on rice can have?

Questions for Private Sector Stakeholders (Firms)

- To what extent have the import restrictions on rice impacted on the cost of production in the fast food industry? What of the growth of the industry?
- How have the imports restrictions on rice affected the employment created by the fast food industry?
- How have the import restrictions affected the quality of rice? What of market/business expansion?
- What impacts do import restrictions have on the environment?
- What other medium/long term inefficiencies do you think import restrictions on rice can have on the fast food industry?

Questions for Civil Society Stakeholders (Individuals)

- To what extent are consumers affected by the ban on imported rice?
- To what extent are other areas of public concern affected (e.g. supply shortages of inputs, higher prices or both)?

- How have the import restrictions affected the quality of rice?
- What other medium/long term inefficiencies do you think import restrictions on rice can have on the consumers?

(4) Comprehensive evaluation of the social benefits and costs of the protection.

Questions for Public Sector Stakeholders (Government)

- What specific impacts do import restrictions on rice have on social amenities?
- What specific impacts do import restrictions on rice have on employment generation?
- What specific impacts do import restrictions on rice have on government revenue?
- How have import restrictions on rice affected government corporate social responsibility (e.g. expenditure on community development, education, health etc.)?
- What impacts do import restrictions have on the environment?

Questions for Private Sector Stakeholders (Firms)

- What specific impacts do import restrictions on rice have on social amenities?
- What specific impacts do import restrictions on rice have on employment generation?
- What specific impacts do import restrictions on rice have on government revenue?
- How have import restrictions on rice affected corporate social responsibility (e.g. expenditure on community development, education, health etc.)?
- What impacts do import restrictions have on the environment?

Questions for Civil Society Stakeholders (Individuals)

- What specific impacts do import restrictions on rice have on social amenities?
- What specific impacts do import restrictions on rice have on employment generation?
- What specific impacts do import restrictions on rice have on government revenue?
- How have import restrictions on rice affected government corporate social responsibility (e.g. expenditure on community development, education, health etc.)?
- What impacts do import restrictions have on the environment?

(5) Comprehensive quantification of the value of waivers granted (costs and benefits).

Questions for Public Sector Stakeholders (Government)

- What is the/are the rationale/s for the granting of waivers and concessions on importation of rice?
- How are quotas on rice importation determined?
- How are waivers and concessions on imported rice granted and administered?
- What criteria inform the granting of waivers and concessions on imported rice? Who decides? Are all relevant stakeholders involved or carried along?

- What values are available (or estimated) for import waivers and concessions granted on importation of rice from 1980-2012?
- What values are available (or estimated) for rice import quotas granted from 1980-2012?
- How much did firms pay for import licences (waivers and concessions)? Why not consider bidding for import licenses? When licences are cancelled, does government return the fees paid to firms?
- Can import quotas be carried over to other years?

Questions for Private Sector Stakeholders (Firms)

- What values are available (or estimated) for import waivers and concessions granted on importation of rice from 1980-2012?
- What values are available (or estimated) for rice import quotas granted from 1980-2012?
- How much did your firm pay for Import licences (waivers and concessions)? When licences are cancelled, are the fees paid refunded?

Questions for Civil Society Stakeholders (Individuals)

- What impact does the granting of waivers and concessions on importation of rice (to few firms) have on consumers?
- What impact does the granting of quotas on importation of rice have on consumers?

(6) Quantification of the potential benefits of tariffication as an alternative measure to import prohibitions.

Questions for Public Sector Stakeholders (Government)

- What are tariff rates on importation of rice since 1980s to date?
- What government policies informed the major changes in tariff rates?
- Are there any potential benefits that tariffication can yield instead of import prohibitions?
- Given the current policies (both domestic and international), is there any feasibility of implementing full tariffication?

Questions for Private Sector Stakeholders (Firms)

- What criteria do firms follow in getting waivers and concessions on imported rice? Are all relevant stakeholders involved or carried along?
- Are there any potential benefits that tariffication can yield instead of import prohibitions?
- What are tariff rates paid on the importation of rice since 1980s to date?
- Are there any other potential benefits that tariffication can yield to firms?

Questions for Civil Society Stakeholders (Individuals)

- How can individual be better off with tariffication as against import prohibitions?
- Are there any other potential benefits that tariffication can yield?

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