

**Market and Welfare Effects of Food Security Policies on
Small Holder Rice Farmers
in Sierra Leone**

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BY

MOHAMED AJUBA SHERIFF (PhD candidate, Agricultural Economics Njala
University)

KEPIFIRI ALPHA LAKOH (Lecturer, Department of Agricultural Economics,
Njala University)

Outline

- Background and Justification
- Problem Statement
- Objective
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- Result
- Conclusion

Background and Justification

- Assessment of food security policies, Agricultural markets and Smallholder farmers Welfare have increasingly been of concern to policy makers and development practitioners in developing countries (Adeleke Salani et al (2011), Kim, Suane et al (2016), Chrispin et al (2009).....
- Food security policies in Sierra Leone have been influenced by donor preferences or political interest notably PL480 rice programme in 2010, Sierra Leone Produce Marketing Board (SLPMB) initiative in 1994, Cooperatives in 1970s, Integrated Agricultural Development Programme (IADPs) in 1970s.

Background and Justification

- The absence of a sustained and coherent national food security agenda that is informed by empirical research and decades of best practices/lesson learnt has led to perpetual failure of interventions
- Some notable donor and ad-hock food security policies that have failed Sierra Leone over the last three decades include the Green Revolution in the 70s, PL480 rice program in 2010 and IADPs in 1970s.

Policy Choices over the Years (Interventions)

- I. Increase domestic rice production
- II. The provision of basic infrastructure required for agricultural development (feeder roads, irrigation facilities, and market, processing and storage facilities)
- III. Promotion of the private sector in the area of agricultural investment and other related policies.
- IV. Removal of tariffs on the importation of rice.
- V. Promotion of agricultural technology through research and development.

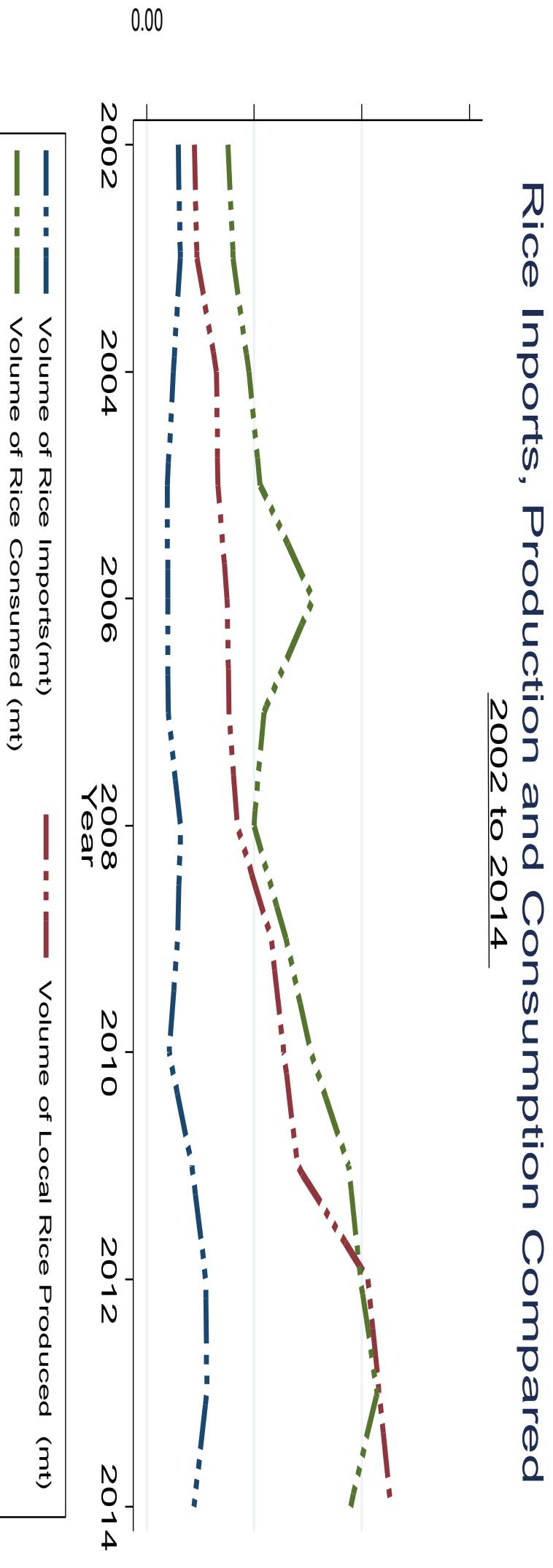
The above food security interventions can be assessed on their respective or collective merits. Most certainly, there had been some rationale for instituting them.

However, the ensued results have not been as fruitful as had been anticipated

Problem Statement and Justification

- I. Food insecurity continues to be a major problem in Sierra Leone. Despite reported increases in the production of the country's main staple crop (rice).
- II. National demand for locally produced rice continues to be low (particularly in the populated urban areas of Sierra Leone), hence accounting for the negligible effect of the increased level of production on food security (Spencer, 2009)
- III. Local rice consumption patterns, at the rural household level have been known to follow a season pattern (High during harvest months and low during planting months).
- IV. This premise may suppose that the problem at hand is a consumer's problem instead of one of a producer. However, this isn't necessarily so. The majority of rice farmers in Sierra Leone cannot compete with imported rice in the domestic market.
- V. Sierra Leone Government spends over \$ 187 Million to import rice on annual basis (2017)
- VI. No rice policy for informed decision making

Rice Imports, Production and Consumption Compared 2002 to 2014



Problem Statement Cont.

- I. The striking revelation however is that some amounts of the inflows (imports and production) are not been consumed locally. That is, rice supplies into the local market outweigh consumer demand.
- II. These three related market patterns, to a great extent, can be seen as being counterintuitive, as they tend to contradict each other.
- III. 1) Increased production of locally produced rice, 2) An irresponsible local rice demand to the increased production level 3) Increased consumer demand for imported rice.

SPECIFIC OBJECTIVES

The three policy options We seek to analyse are :

- I. The effects of reinstating tariffs on rice imports
- II. The effect of providing subsidies that increase local rice production (supply) for farmers (A value-chain, multi-intervention approach)
- III. The effects of instituting a quota on rice imports.

OBJECTIVE CONT.

To analyse the three food security policy options and the associated welfare implications with the aim of making recommendations for the formulation of rice policy in Sierra Leone.

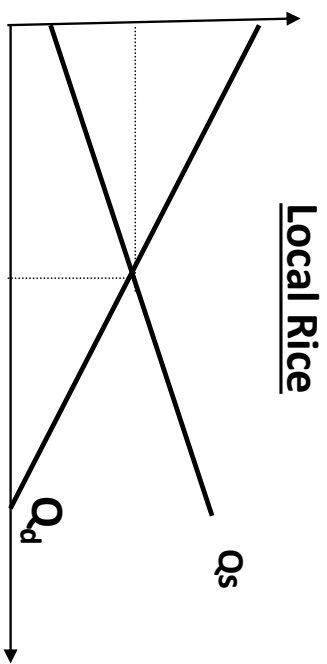
METHODOLOGY

- Equilibrium-Displacement Models (EDM) was utilised.
- The Equilibrium Displacement Models uses general equilibrium theory as a basis for the analysis of displacement to an equilibrium system.
- The objective is to use the known parameters to calculate the unknown parameters.
- The known parameters are mainly elasticities and market shares of both local and imported rice while the unknown parameters are the market effects (changes in quantity demanded, supplied and prices).

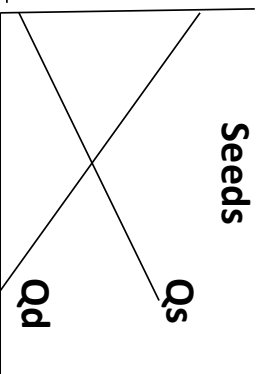
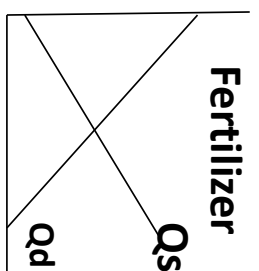
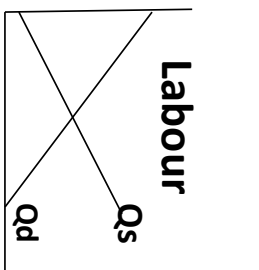
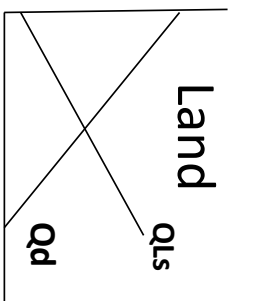
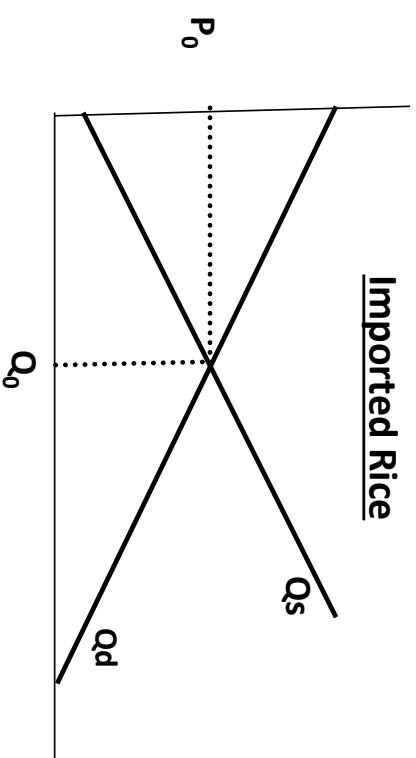
METHODOLOGY Cont'd

- Using comparative static analysis, we show the effect of shocks to a general equilibrium system and how this system changes when the shock is introduced.
- We assume two up-stream markets (Imported Rice and Locally Produced Rice) and four downstream input markets (Land, Labour, Fertilizer and Other).
- The inputs will be used only in the production of locally produced rice and linked by a production function (represented as a cost function) $C(Q_L, W_L, W_Lb, W_O, Wf)$.

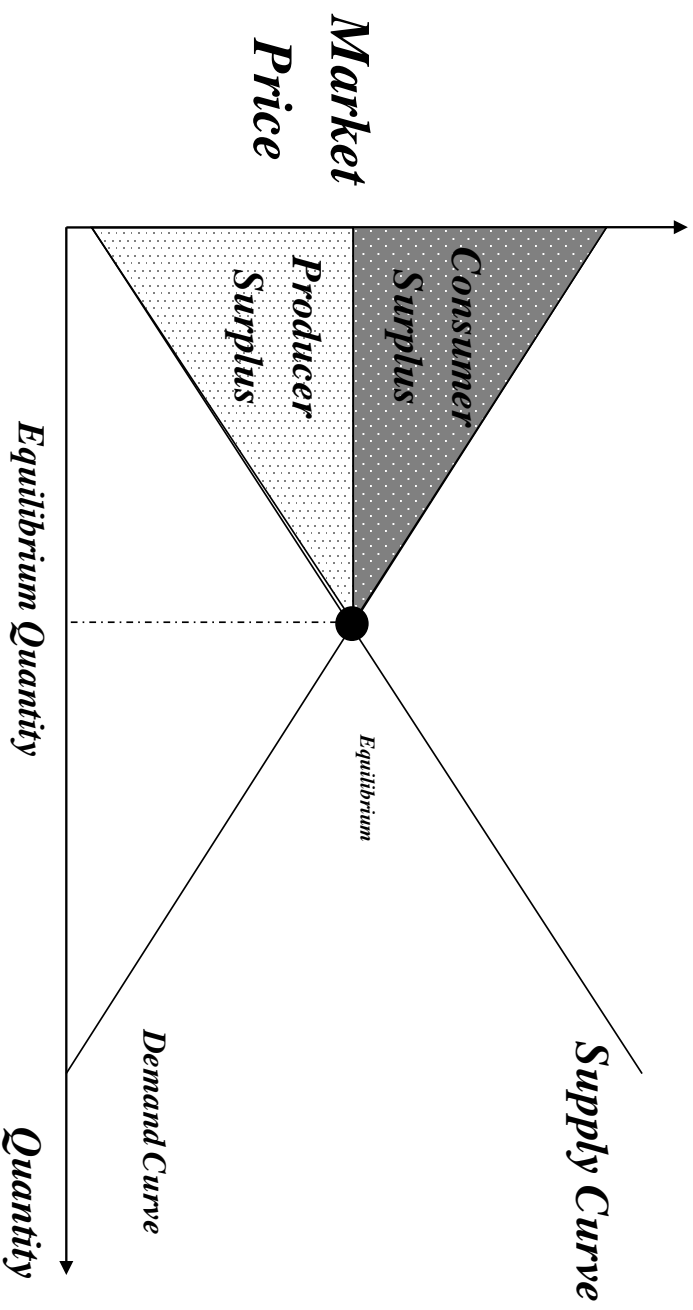
— Rice Multi-Market General Framework



$C(Q_L, W_L, W_{Lb}, W_O, W_F)$



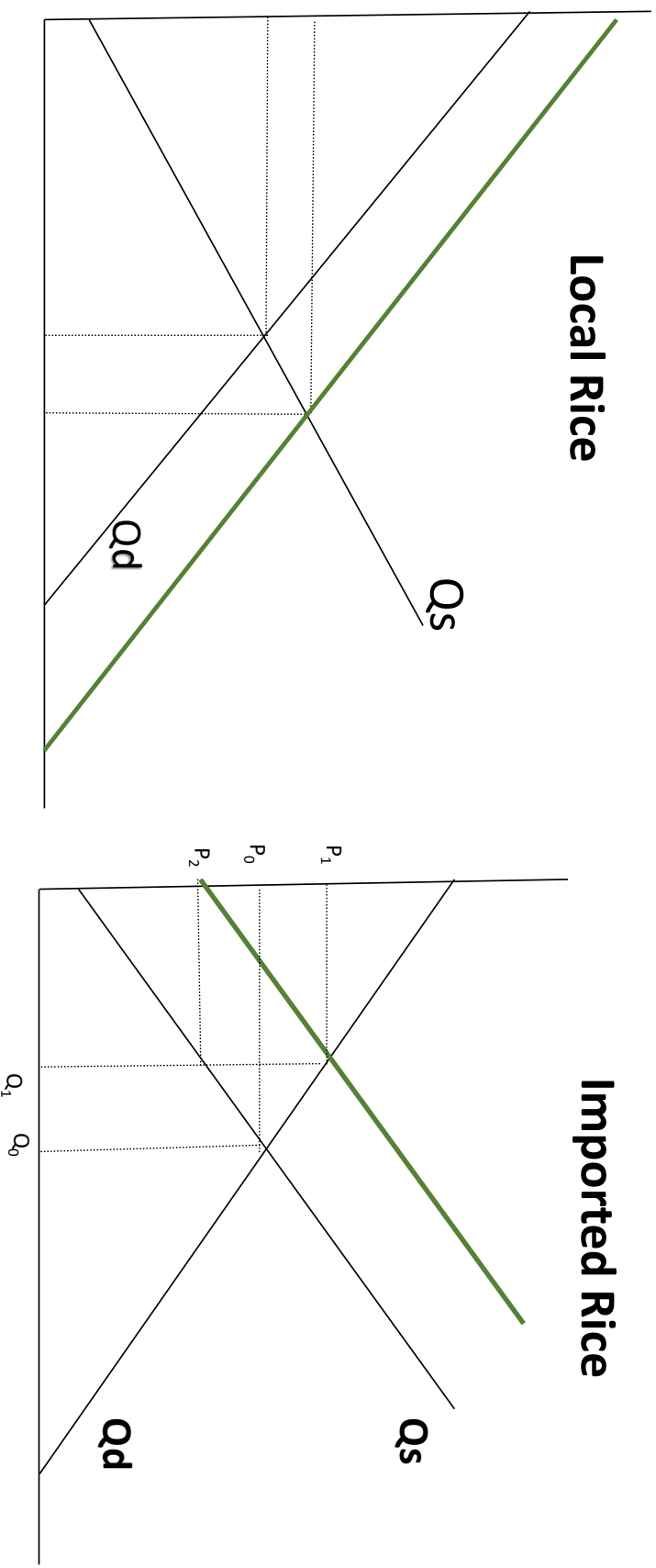
WELFARE MEASURE



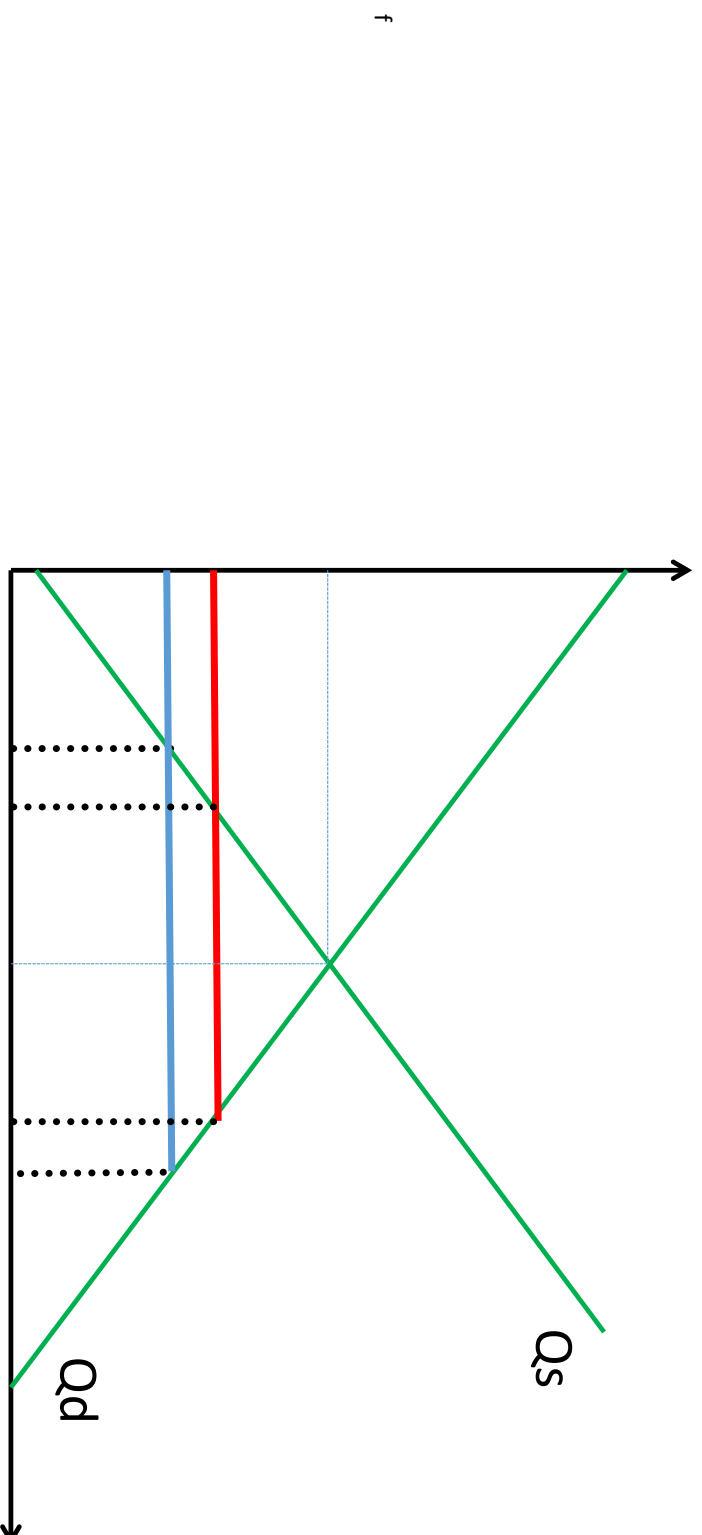
WELFARE MEASURE CONT.

- The welfare effects of an equilibrium change are generally approximated as the changes in consumer and producer surplus.
- If the producer surplus is positive, then the food security policies have improved the smallholder rice farmers welfare
- If the producer surplus decline (negative), then the food security policies have not improve the welfare of smallholder rice farmers.
- If the loss on producer surplus is less than the gain in consumer surplus then the food security policies intervention has been successful in improving the national welfare.

Effect of Reinstating Tariffs



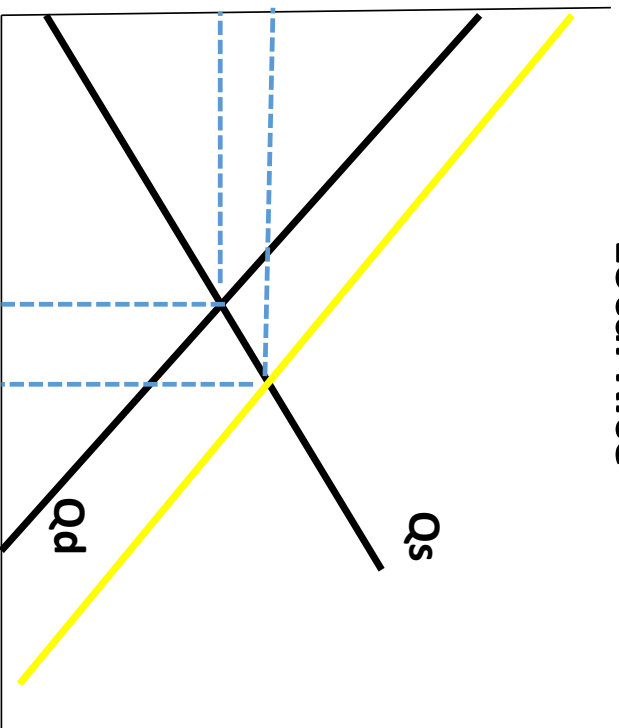
Single Market Model (Effect of Reinstating Tariff)



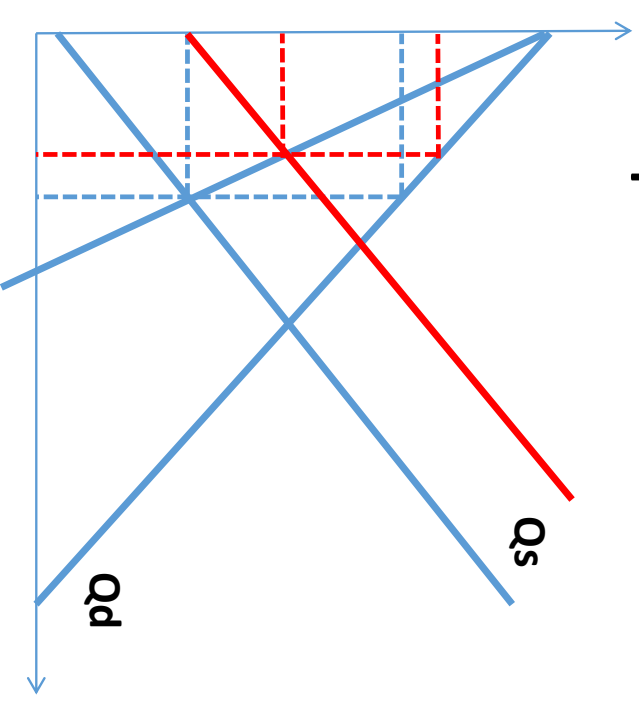
Multimarket model with oligopolistic rice

Importation market

Local Rice



Imported Rice Market



RESULT – POLICY REVIEW 1

1 Two main results when a tariff is reinstated

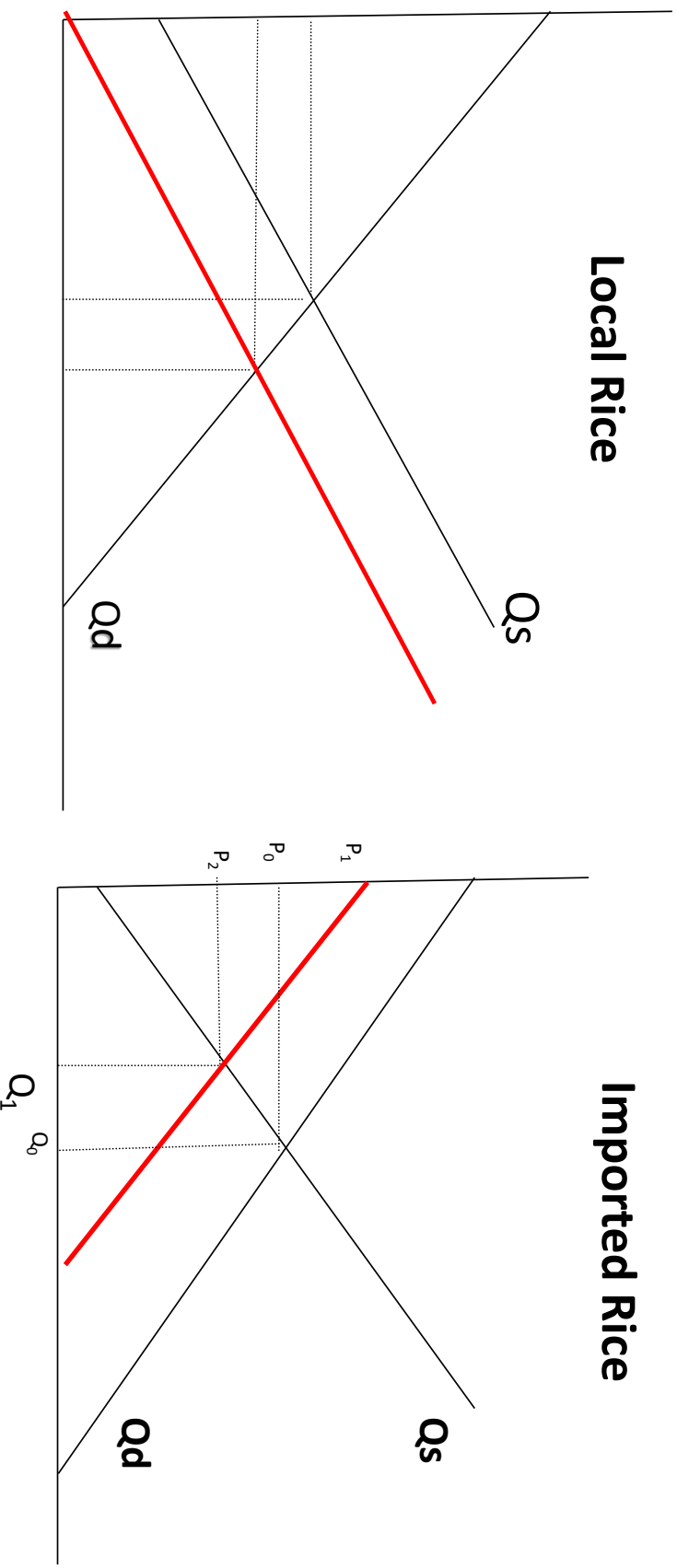
1) Farmers' welfare is enhanced.

2) Consumers' welfare is dis-enhanced.

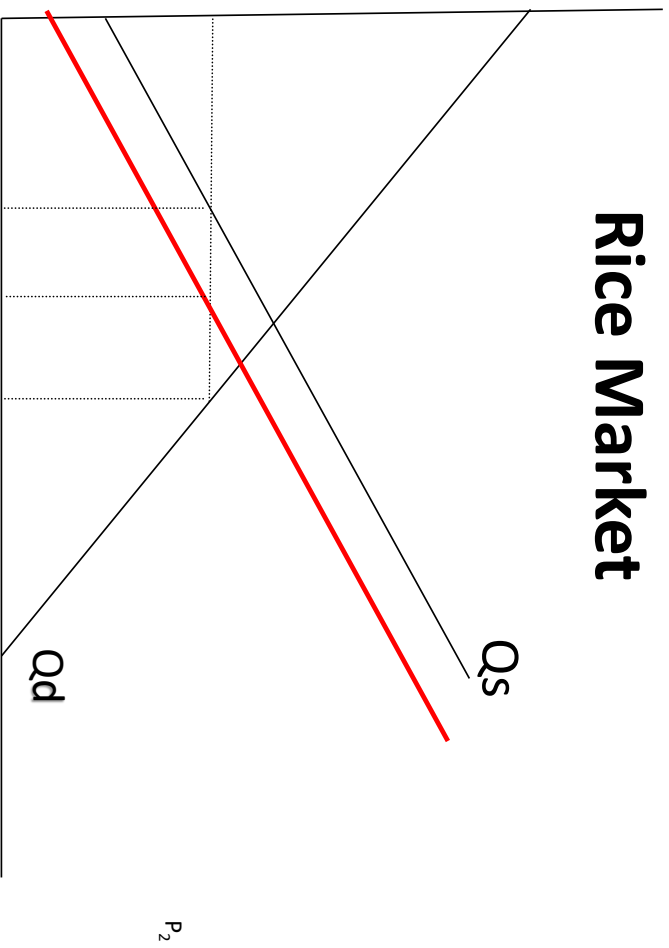
EFFECS : Socio-political and economic,

Suggested policy option: A more feasible option is having the tariff reinstated over a period of say 5 year. This is done such that minute proportions are levied annually (4% annually). Every year the effects are reviewed and an incremental percentage instituted.

Effect of Increased Production



Effects of Increased Production Single Market



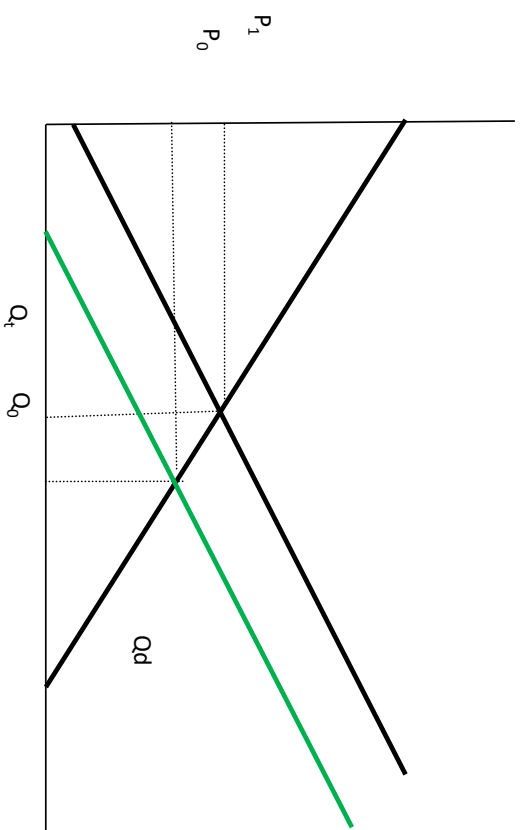
RESULT - POLICY REVIEW 2

- **Policy Review 2: Two main results when subsidies are provided (Multi-market comparison)**
 - (1) Consumer's welfare enhanced**
 - (2) Producer's welfare slightly (Single market framework)**
 - (1) Consumer's welfare remains unchanged**
 - (2) Producers welfare is significantly enhanced.**
 - (3) EFFECTS : Producers and consumers do not lose any thing.**

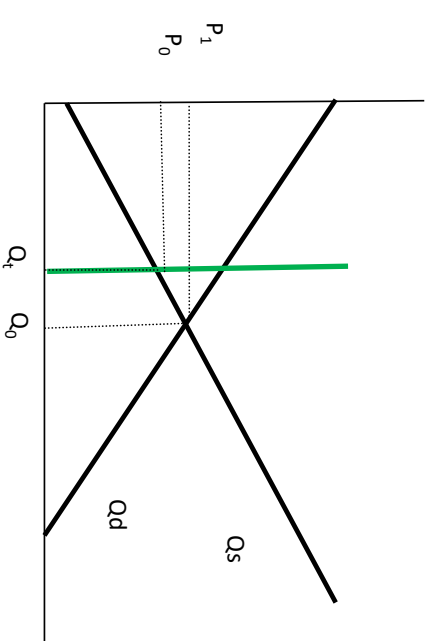
POLICY REVIEW/ 2 CONT.

- *Suggested policy option :*
- *More visible option than reinstating tariffs*
- *Producer welfare is enhanced*
- *Intervention along the value chain*
- *Government pay cost*
- *Separate research on specific type of subsidies*

Effect of a Quota



Imported Rice



RESULT - POLICY REVIEW 3

3. Result : A quota leads to a win-win solution both producers and consumers.

EFFECTS :

- (1) Producer's welfare enhanced
- (2) Consumer's welfare enhanced

Suggested policy option :

A quota option provided there is enough local rice.

Given the current landscape, coupled with the low level of production and productivity in last year's production cycle (as a result of Ebola) It is best that a quota is not levied in the next three years to allow the sector to recover completely.

CONCLUSION

- **Initial results reveal that the most win-win gains can be obtained by the use of multiple food security policies at different times.**
- **Welfare of consumers and producers of locally produced rice is enhanced significantly by the third policy option (increase in production of locally produced rice)**
- **The use of gradual introduction of the tariffs on imported rice, particularly after the effects of the Ebola Virus Disease (EVD) have been cancelled would be the best way to proceed.**

CONCLUSION CONT.

- **That rice trade flows (across boarders) is causing the unexplained high demand for locally produced rice and the prevailing market structure which gives market power to few retailers of locally produced rice.**
- **Clearly, the above results suggest separate studies focusing on these two factors for the whole country.**
- **An in-depth research on the types of subsidies and strategies that can trigger local rice production and at the same time promote the welfare of smallholder rice farmers is recommended.**

THANK YOU FOR YOUR ATTENTION