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## **Rice Sector Policy Options in Guinea bissau**

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## **ABSTRACT**

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Rice in Guinea Bissau occupies a very important place in the agricultural and national economy of the country. Traditionally the main staple grain in this estuarine country, it has in recent decades become the largest food import. Government policy toward the rice sector is complicated by its relationship to cashew cultivation – while not serious competitors in terms of land, the majority of households grow at least some cashew which is bartered for rice at a rate of exchange which de facto sets the relative prices between the two crops. This paper discusses the relative merits of alternative policies to promote growth in rice production in light of these considerations.

# Rice Sector Policy Options in Guinea Bissau<sup>1</sup>

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## I. Introduction

### A. *Current Situation in Guinea Bissau*

Guinea Bissau is a low lying estuarine country which is very suitable for all types of rice cultivation. In coastal areas, the numerous river estuaries and their tides (up to 7 m) play an important role providing major channels for transport and irrigation. In the interior, the fresh watercourses diminish substantially during the dry season. Groundwater sources are abundant and of variable qualities.

Three main agro-ecological zones can be distinguished – the Eastern, Northern and Southern. The Eastern agro-ecological zone is characterized by a Sudan climate with two distinct seasons – a dry season between November and May and the rainy season from June to October. Average annual rainfall varies between 1200-1500mm in 107 rainy days. Average annual evapotranspiration is 2,507mm. The annual average temperature is 27.4°C with relative humidity of 26%. Because of the irregularity of precipitation this zone has the lowest potential for rainfed upland rice but there is great potential for irrigated rice with an estimated potential of more than 25,000ha of irrigable lowland in the Geba River valley alone.

The Southern agro-ecological zone comprises the regions of Tombali, Quinara and Bolama/Bijagos and is characterized by a humid subtropical climate. Average precipitation is 2,000-2,500mm in 125 rainy days with 70% of the precipitation in July, August and September. Annual average temperature is 26.9°C with relative humidity of 70% and annual evapotranspiration of 1,458mm. This is the agro-ecological zone with the greatest agricultural potential in Guinea-Bissau particularly for mangrove swamp rice. It contains Cumbidja River valley which is considered the main mangrove swamp rice-growing area with an estimated potential of 22,000 ha.

The Northern agro-ecological zone (Oio, Cacheu, Biombo) is characterized by a Guinean maritime climate. Average annual precipitation varies from 1500-1877mm in 122 rainy days with annual evapotranspiration of 1,837mm. Average annual temperature is 26.6°C. The zone has good agricultural potential for mangrove as well as lowland rice production. The Mansoa River valley represents the main rice-growing potential, estimated at 19,000 ha. (See

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<sup>1</sup> Funding for this paper was received from the World Bank. All errors/omission or opinions are solely due to the author.

Spencer and Djata 2008 for a detailed description of hydrology and suitability for rice cultivation)

### *B. Cashews, Rice and Vulnerability to Crises*

The experience of the past several years has demonstrated several basic facts about Guinea Bissau's rural economy:

1. The farmgate price of cashew is and will remain the single most important determinant of incomes in rural areas. Most rural households are net sellers of at least a small amount of cashew and changes in this price translate directly into changes in income for many (indeed most) of the poorest in rural areas. What data is available strongly supports this point. In a 2013 survey of Guinea Bissau, the World Food Program found that 80% of households benefits from cashew sales. No other single commodity or policy has anywhere near the broad impact that cashew prices do.
2. This salient role of the cashew price is a two edged sword – While it provides a readily usable lever through which policy can strongly affect rural incomes and welfare, it also is a source of vulnerability. Indeed, fluctuations of the cashew price generate more uncertainty and risk than almost any other source. Cashew price declines can drop many below poverty levels of income and indeed have done just that in recent years.
3. Fluctuations and risk due to cashew price changes need not come only from world markets. Government policy can just easily cause problems, especially when stop-go policies make it difficult to rely on any particular price even within a single growing season.
4. Rice remains the single most important grain crop in the country. It is widely grown though most growers do not sell a significant amount into the market. It is also widely used by cashew traders to barter for raw cashew supplies, though these supplies are almost exclusively supplied via imports. Imports also are sold in some urban areas.
5. One implication of Point 4 above is that rice presents some difficulties for policy that complicate potential initiatives in the sector. It is at once an important agricultural output as well as a major item in most Guineans' consumption basket, which means that price changes are good for some and bad for others. It is also at the same time a major import and a major potential

export crop (in the longer term). Again, there are winners and losers from various potential policy initiatives.

### *C. Political Situation and Problems with Governance*

The political economy of Guinea Bissau when coupled with the extremely poor governance that has become a standard fact of life in this country mean that there can be no expectation that the policy levers available to the government (e.g. cashew policy) will be used with any long run optimal view in mind. Rather, short run rent seeking is a far more likely outcome, as demonstrated by the experience of FUNPI, a mechanism designed to promote cashew processing development through levies on exports of raw cashew. While clearly defensible from an economic point of view, this mechanism is just as clearly capable of abuse, with accumulated funds diverted from their intended developmental targets. Worse still, politically inspired changes in the terms of the levy have gone far toward destroying any semblance of stability in the cashew market.

### *D. The Question to be Addressed by this Paper*

All of these considerations together with the recent experience with FUNPI in Guinea Bissau have given cause for a search for ways to diversify rural incomes so as to reduce vulnerability to policy induced (or indeed market induced) gyrations in rural cashew prices. In particular, attention has been drawn to the traditional staple grain of Guinea Bissau – rice. Given that crises in rural incomes, whether they originate in cashew policy or elsewhere – manifest themselves in widespread hunger and malnutrition, it is perhaps natural to ask whether interventions in the most important food crop can in some way alleviate the problem. The question to be addressed can be stated as follows:

Given extreme vulnerability to cashew price level and fluctuation, can rice policy do anything to alleviate this, especially for the most vulnerable third of the population?

The question is perhaps more obvious to close observers of Guinea Bissau than might be apparent at first glance. This is due to the fact that the rice and cashew markets have been closely linked over the past several decades due to the mechanism through which cashew exporters acquire raw cashew for export. In essence, they have instituted a barter system in which cashew is traded directly for rice which is provided by cashew exporters. In many cases

this results in an entirely non-monetized transaction in which the price of cashew is implied in the terms of trade offered for the barter for rice. Indeed most of the rice imported into the country is used in exactly this way. This means that the cashew trade not only has a direct link to the farmgate price of cashew – it has a direct link to the rural price of rice as well.

The answer to the above question will be analyzed in two parts – interventions that can have an effect in the short run and those which can have an effect in the long run. Obviously, there are different constraints and possibilities depending on the time frame chosen, with equally obvious implications for what is really possible if the goal is to alleviate crises of hunger and poverty in the short run vs. the more developmental question of long run growth.

Short run policy must take the current economic structure, (i.e. farm level land tenure, productivity and related indicators), the marketing system, and infrastructure as given. Long run policy should be based on comparative advantage and looks at how GB's long run investment plan can best exploit this in a way to benefit the largest number of people possible. It is worth making clear at the outset that Guinea Bissau's current situation means that the ability of policy to make a significant offset to adverse developments in the cashew sector is limited in the short run. The extremely poor infrastructure coupled with lack of technological progress at the farm level mean that only a limited response to price incentives can be expected. But existing measures of comparative advantage show that the long run potential in rice is very attractive and should be exploited if possible.

The next section of this paper provides an overview of the current situation in Guinea Bissau in terms of rice cultivation and consumption. A brief history of rice cultivation is followed by a discussion of the main production systems for rice after which trends in consumption, imports and marketing are examined. The next section analyzes how rice prices are set in Guinea Bissau, together with a review of the policy options for affecting these prices. This is followed by a section looking at the long run potential for rice in the country and the obstacles to exploiting the comparative advantage that the country clearly possesses. Finally, the paper concludes with a section discussing what interventions are possible in the short run (i.e the next 2-3 years) and what results can reasonably be expected.

## II. Rice in Guinea Bissau

### A. *History of rice cultivation*

Rice cultivation in Guinea Bissau started with mangrove rice cultivation in the Mansoa River valley in the Northern agro-ecological zone in the pre-colonial period over 500 years ago when there was abundant rain and high soil fertility. The traditional Balanta farmers claimed fields from the sea, desalinated them by constructing dykes around them, allowing leaching by rain water before cultivating rice. Rice production was for domestic use with rice often battered for other commodities and imported items.

The colonial war of pacification in 1915 worsened the rice-growing situation as whole villages were burnt, flocks were slaughtered and the maintenance of rice-growing systems was compromised. Forced labor that followed the pacification wars aggravated the rice-growing crisis in the North. Labor was relocated to construction of buildings and houses for the colonial civil servants as well as bridges and roads. Because of the repressive conditions imposed by the Colonial regime in the North there was massive migration of peoples of the “mother country” to new areas in the south, in the area of Catio, Tombali Region where the immigrants established rice growing systems where the agro-ecological conditions were suitable. In these systems rice was produced for commercial purposes in addition to subsistence production. As a result national rice production rose between 1930 and 1960 and the country exported small quantities with a peak between 1940 and 1955. Average annual production was estimated at 45,000 tons of paddy or 30,000 tons of clean white rice, out of which 7,000 tons of white rice were exported.

During the national liberation war (1955-1960) and the civil war that followed (1963 – 1973) rice production again declined as there was social disturbances, terror and fright. Rice fields were bombed by the Portuguese military destroying hydraulic infrastructures (bridges and anti-salt dykes) in order to cut off food supplies to the liberated zones. Also the relationships of authority between the old and youths, one of the pillars on which rice-growing sustained itself was eroded with consequent migration of mangrove rice cultivators ending in total abandonment of many mangrove swamp rice perimeters. Urban centers under the control of the colonialists had to import rice and in the liberated zones controlled by PAIGC, the producers were forced to develop subsistence rice cultivation on the much less productive uplands (Mpam-pam).

The period immediately after the National Liberation war (1973-1987) was characterized by a program to re-launch agricultural production. One of the main pillars in the attempt to reach food self-sufficiency was to expand the area of mangrove swamp rice cultivation by the rehabilitation of sea dykes, construction of sluice gates and mangrove swamp rice perimeters. Thirty-nine dykes and sluices were constructed during the period with nine more after 1988 totaling 48 anti-salt sluices protecting more than 100.000 ha with an average investment per



sluice estimated by FAO at around US\$40,000. However, it is estimated that rehabilitated areas served by 23 of the sluice gates were not cultivated which corresponds to 50% of the area of abandoned mangrove swamp cultivation in the country. Lowland rice cultivation in small valleys was also encouraged in the in the East with women predominating in the activity and an estimated 29.400 ha being put under cultivation by 1995. Upland rice cultivation was actively discouraged by the Government.

Table 1 shows the current situation in terms of food production in Guinea Bissau. As can be seen, rice is the dominant staple grain – Note that the difference between net and gross production includes not only losses but also the need to hold back seed for the following crop season.

**Table 1. Average and recent net crop production**

Crops	Average	Campaign	Net Production 2012/2013	
	5 yrs *	2012/2013	Tons	(% difference from gross)**
Rice Plateau	49,735	53,915		
Rice valley and <i>Bolanha</i>	68,808	97,083		
Rice mangrove	48,292	43,506		
Rice (produced in Bissau)	3,760	4,000		
<b>Total Rice</b>	<b>170,595</b>	<b>198,504</b>	119,102	<b>-40%</b>
Corn	8,339	7,195		
Sorghum	17,066	23,547		
Millet	18,055	16,954		
Fonio	478	580		
Dry cereals (produced in Bissau)	1,474	2,000		
<b>Total Dry cereals</b>	<b>45,412</b>	<b>50,276</b>	<b>42,735</b>	<b>-15%</b>
<b>Total Rice and Cereals</b>	<b>216,007</b>	<b>248,781</b>	<b>161,837</b>	<b>-35%</b>
Cassava	44,197	20,755	15,774	-24%
Sweet Potato	18,253	13,340	11,459	-14.1
Peanut	34,695	45,214	45,214	0
Bean <i>Mancanha</i>	1,531	565	565	0

\* 5 years average (2007-2011)

\*\* The difference between gross and net production is due to either lost production or seed retention

Source: Harvest Evaluation Mission 2012/2013, GoGB/CILSS/WFP/FAO, 2013,

### *B. Rice production systems in Guinea Bissau*

Rice is the main staple food for Guinea-Bissau, accounting for 37% of the value of food consumption and about 40% of daily calorific intake of the average household. According to the

International Rice Research Institute (IRRI), Guinea Bissau’s rice consumption per person per year was estimated at 87.3 kg in 1999. With a population currently estimated at 1.6 million and, using current rice consumption rates per person per year, the country requires 139,680 tons of milled rice annually equivalent to about 235,000 tons of paddy to reach national rice self sufficiency.

Table 2 shows the evolution of domestic rice production in Guinea Bissau in recent decades indicating that production peaked in the second half of the 1990s before the recent civil war and only recovered in 2007, rising to about 200,000 MT/year in the most recent years.

In Guinea-Bissau, rice is currently produced in three ecosystems – rainfed uplands, lowlands (rainfed and irrigated) and mangrove. The descriptions below are taken from Spencer and Djata (2008). Table 3 shows the yields achieved in each of these systems.

Table 2: Area Harvested, Yield and Average

Annual Production of Rice (paddy) in Guinea Bissau

<b>Year</b>	<b>Area</b>	<b>Yield</b>	<b>Production</b>
	Ha	Kg/ha	Metric Tons
<b>1961/65</b>	66,200	741	48,400
<b>1966/70</b>	34,000	1,187	40,100
<b>1971/75</b>	44,400	859	37,800
<b>1976/80</b>	70,000	734	52,400
<b>1081/85</b>	102,600	1,024	95,630
<b>1986/90</b>	53,707	2,037	109,370
<b>1991/95</b>	65,084	1,959	127,413
<b>1996/2000</b>	65,613	1,512	98,746
<b>2001/05</b>	66,384	1,354	89,767
<b>2006</b>	65,000	1,631	106,000
<b>2007</b>	70,087	1,816	127,250
<b>2008</b>	82,197	1,810	148,757
<b>2009</b>	89,305	2,037	181,894
<b>2010</b>	100,510	2,082	209,240
<b>2011</b>	106.300	1,648	175,213
<b>2012</b>	107,000	1,855	198,504

Source: FAOStats

### Upland rice

The traditional slash and burn system of upland rice production is practiced in all agro-ecological zones. The usual practice is multiple cropping of rice, maize, grains, leguminous cultures, fruits and roots, etc. After one year of cultivation the land is either planted to cashew or left fallow for 5 – 15 years depending on population density and availability of arable land in the community. The system has a negative impact on the environment causing loss of vegetation cover and biological diversity. It is estimated that there are less than 40,000 upland rice farms cultivated annually in Guinea Bissau covering about 26,000 ha with yields of 400 – 600 Kg per ha, and normally producing about 10% of national paddy production ( 46% in 2008) with no purchased inputs used by farmers.

### Lowland rice

Although found in all agro-ecological zones, the lowland or inland valley rice production system predominates in the Eastern agro-ecological zone. Rice is grown in depressions which have hydromorphic conditions during part of the year. It is estimated that there are more than 200,000 ha potential suitable for rainfed and irrigated lowland rice production, out of which about 27,000 ha are cultivated under rainfed conditions by small farmers with yields ranging between 800 to 1,200 kg/ha.

Some of the lowlands and river terraces in the East particularly of the Geba River have been developed further into irrigated perimeters usually with Government or foreign donor funding and divided into 0.25 ha plots which are leased to farmers on a long term basis. Irrigation is almost exclusively by motor pump and improved varieties and purchased inputs are used. Land preparation is often by tractors. Presently irrigated production centers are in Bafata (154 ha), Carantaba (35 ha) and Contubuel (135.5 ha). With proper management two crops are taken a year with yields ranging from 3-5 tons in each crop season and up to 7 tons/ha in the dry season. This production system has accounted for about one third of total production in recent years.

### Mangrove Swamp Rice

This is the most extensive system of rice cultivation in Guinea Bissau and is widely practiced in coastal regions. Rice paddies are established by building anti-salt dykes along the banks and parallel to the estuaries with sluice gates. These anti-salt dykes prevent salt water intrusion into the rice fields and retain fresh water from rain necessary for the process of rice growth. Dykes are usually constructed by manual labor. Mechanical construction has also taken place using a service provided in the past by the Government but is currently unavailable.

It is estimated that there are more than 106,000 ha potentially suitable for mangrove rice production, out of which 50,000 ha have been reclaimed and are partially managed by the farmers. However only 16,564 ha are estimated to be cultivated in 2007 due to poor rainfall conditions with yields of 1,800 to 2,600 kg/ha. Fields are puddled and rice transplanted. No mineral fertilizers are applied. Mangrove swamp rice has historically provided the bulk of production in the country (80% according to Spencer and Djata 2008) but due to lack of repair and maintenance of infrastructure, especially following the civil war in the late 1990's, now accounts for less than 25%.

Table 3: Average Rice Yields in Guinea Bissau

Rice crop type	Yield Range (bad year – good year)	Mean yield
	Tons/ha	Tons/ha
Mangrove – N	1.8-2.6	2.2
Mangrove – S	1.8-2.6	2.2
Irrigated - rainfed	3.0-4.0	3.5
Irrigated - Pump	5.0-6.0	5.5
Lowland	0.8-1.2	1.0
Upland	0.4-0.6	0.5

Source: National Statistics Service

### III. Marketing and Pricing Rice in Guinea Bissau

#### A. How does the price get set in this small open economy?

As noted in the introduction, there is substantial domestic production most of which is consumed by the producers themselves. However, some of this output does reach local markets, though not enough to supply national needs. Imports make up the rest of domestic availability with about two thirds of imports bartered directly for raw cashew and a third sold into mainly urban domestic markets. Details of marketing channels for domestic and imported rice are detailed in this section. Table 4 shows the overall production/import/consumption balance for the principal crops. Figures 1 and 2 show marketing channels for domestic and imported rice.

**Table 4 Total food surplus/deficit projected for 2012/13**

Forecasts 2012/2013	Rice	Blé	Millet/sorghum corn/other	Total
	Tons	Tons	Tons	Tons
<b>Domestic availability</b>	<b>122,602</b>	<b>656</b>	<b>4,3363</b>	<b>166,621</b>
Gross production	198,504		50,276	248,780
Net production	119,102		42,735	161,837
Initial Stocks	3,500	656	628	4,784
<b>Needs</b>	<b>229,508</b>	<b>15,864</b>	<b>64,023</b>	<b>30,9395</b>
<b>Gross surplus/deficit</b>	<b>-106,905</b>	<b>-15,208</b>	<b>-20,660</b>	<b>-142,774</b>
<b>Balance of imports and exports</b>	<b>101,291</b>	<b>9,203</b>	<b>5,131</b>	<b>115,625</b>
Foreseen imports	<b>100,055</b>	<b>9,203</b>		<b>109,258</b>
Foreseen aid	1,236	0	5,131	6,367
Foreseen exports	...	...	...	...
<b>Total surplus/deficit</b>	<b>-5,614</b>	<b>-6,005</b>	<b>-15,529</b>	<b>-27,149</b>

Source: Harvest Evaluation Mission 2012/2013, GoGB/CILSS/ PAM/FAO, 2013

#### Marketing Channels for Locally Produced Rice

It estimated that the majority of rural households engage in rice production. Of these, less than a third market any of their production. (See Table 5) Essentially, this local rice economy functions much as it has for centuries: Rice is produced through mainly traditional

Table 5: Percent of Farmers Reporting Sales of Domestic Rice in 2007

Rice Production System	Percent Farmers Making Sale
Mangrove Swamp – North	13
Mangrove Swamp – South	36
Irrigated – Rainfed	0
Irrigated – Pumping	31
Upland	20
Lowland	8

Source: Field survey from Spencer and Djata 2008

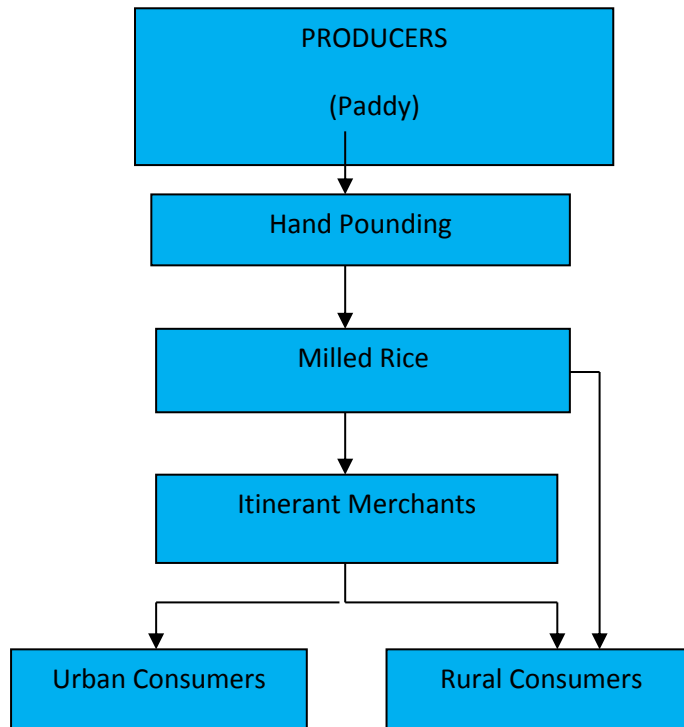


Figure 1: Marketing Channels for Domestic Rice in Guinea Bissau

methods with little or no purchased inputs, and is eaten by those who grow it. However, some small amounts are often sold, usually in provincial market towns. It is reported that some of this output finds its way to the city of Bissau, but amounts are very small.

There are very few traders engaged in rice trade apart from those who use it to barter for cashew. Much of what output is marketed is brought to market by farmers themselves, who rarely travel very far from their homes. This lack of an effective marketing system is the single most important characteristic of the market for locally produced rice. It is worth emphasizing this point:

*- For the two thirds of rice producers who sell no output off-farm, urban rice prices are irrelevant, at least in the short run. They each exist in economic isolation from the rest of the country and cannot respond to production incentives because they never SEE these incentives.*

#### *B. Marketing Channels for Imported Rice*

Rice imports into Guinea Bissau is controlled and licensed by the government. As of 2008, four Government licensed merchant houses (Gomes and Gomes, Cogequi, Socobis and Agencia Bijagos) sourced most of their supplies from China, Vietnam and Thailand. According to Spencer and Djata (2008) it is estimated that 50% - 70% of imported rice is used in barter trade for cashew which is a non-monetized exchange of one product for another. As discussed below, pan-territorial prices for imported rice are set by the government based on CIF prices and assorted markups.

More recent information (Pereira personal communication 4-2-14) lists 10 licensed traders:

- 1 - GOMES & GOMES
- 2 - BÁ IRMÃOS
- 3 - SOCOBIS
- 4 - ETG-BISSAU
- 5 - ADJ IRMÃOS
- 6 - SANTY COMERCIAL
- 7 - CHETA - GUINÉ
- 8 - CAR SILVA
- 9 - GETA BISSAU
- 10 - MARIAMA TUNKARA

There is no reliable estimate of the number of rice retailers/traders around the country. Anecdotal information indicates that the majority of them are foreign nationals (e.g. Mauritians, Guineans) but this could not be verified. Also impossible to verify is the extent to which these traders may represent a substantial change from the information revealed in the 2008 field survey performed by Spencer & Djata. Given the fact that this information is in no way inconsistent with the picture painted by that survey (i.e. that there are a number of rice importers who both sell in urban areas and also barter for cashew) and there is no evidence that any large change has occurred, there is no reason to suppose the market structure has changed to any great degree. Indeed, the WFP rapid survey of 2013 reports on barter terms of trade and is entirely consistent with this view.<sup>2</sup>

The retail price of rice is set by the Government in consultation with the importers, and is the same throughout the country. In negotiating the retail price importers arrive at a cost per bag ex-warehouse in Bissau by adding a markup on the CIF cost per bag. From information supplied by one of the importers this totaled about 18% of the CIF value in the first quarter of 2008, made up of customs duty (12.5% in 2007, reduced to 2.5% in March 2008 to cushion the effect of global rice price increases on consumers), port charges (CFA 2800/ton), cost of Letters of Credit and suppliers fees (5%), transfer fee (1.25%), stevedoring (CFA 110 per bag), transport from the port to importer's warehouse (CFA 100 per bag), administrative costs (3%), SGS import inspection fee (1.7%), transportation to retailers (1%), and shortage (1%)

The importers usually transport milled rice from their warehouses to those of their retail customers located in most urban areas of the country in their own fleet of trucks at no additional cost to the retailers. This situation is acceptable by the importers as they are all exporters of cashew and the trucks usually return to Bissau loaded with cashew.

It is important to note that though the price is based on the world price of rice in international markets, the government has some scope for affecting the price by reducing import duties or other fees associated with the imports. Though there is no evidence that it has ever actually happened, the government could in theory mandate prices even lower than the CIF price so long as the barter terms of trade resulted in an adequate net profit for the import licensees. Two unavoidable side effects should be emphasized which would limit the effectiveness of such a policy:

- For the 30-40% of rice imports that are sold directly into urban or provincial markets, a reduced price would translate directly into lower retail prices. The analytics of a tariff reduction are so well known as not to require exposition here, but suffice it to say that a reduced tariff (or other

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<sup>2</sup> The World Food Program's rapid rural survey of 2012-2103 was conducted after the disruptions of the April 2012 coup d'etat and was based on surveys in the provinces of Olo, Biombo and Quinara. Information was based on quantitative data collection at the household level, key informant interviews at the community level and secondary sources for national level data. See WFP 2013 for a full description as well as a copy of the survey instrument used.



fee or levy which amounts to the same thing) would result in a lower retail price conditioned by the elasticity of demand for rice. Consumers would clearly gain insofar as they have access to these market outlets while producers would suffer insofar as they produce (or could produce) for these same markets. The government would lose revenue, which would limit the sustainability of the policy.

- The effects on the rice/cashew barter system is a bit more complicated. To the extent that rice prices are lower, what this means to the barter terms of trade is that more rice is exchanged for a given amount of cashews. While this would clearly be a good thing for farmers who engage in rice/cashew barter, it would amount to a tax on the cashew trade if the government forced the rice/cashew traders to absorb the price drop, reducing the profit margin on the entire transaction.

Given that world cashew prices are set by world market conditions, the higher the price paid to farmers, the less the margin is between that price and world prices. Those licensees engaged in the rice/cashew barter would then want very much to recoup these losses somewhere else in the process or else face reduced incentives overall to engage in the trade. To put it in simple terms, for the 60-70% of imported rice that is used in the cashew barter trade, a change in the rice price is the same thing as a change in the barter terms of trade and ends up affecting the whole in much the same manner as a cashew levy or tax on another stage of the process, or simply a higher price. Of course, if the government itself absorbs the price decrease via decreased fees or taxes, rice/cashew traders would see what amounts to a subsidy, increasing their demand for raw nuts.

The 2013 crop year demonstrates that there is no “free lunch” when it comes to the rice/cashew price ratio on international markets and the barter terms of trade at the farm level. In this year (See Figure 3) the barter terms of trade for farmers deteriorated from 1kg of raw cashew exchanged for 1kg of rice (i.e. 1:1) to a level of 1:3. Not only is this experience key in understanding the motivation for the current desire for lower rice prices, but the result of it is also important. The WFP (See WFP 2013) reported that more than a third of the cashew crop remained unsold at this price late in the season and that traders had stopped operations due to lower international prices and demand even at these more favorable terms of trade.

The lessons are clear:

1. International prices DO affect internal prices in rural Guinea Bissau
2. Both farmers and cashew traders are responsive to incentives

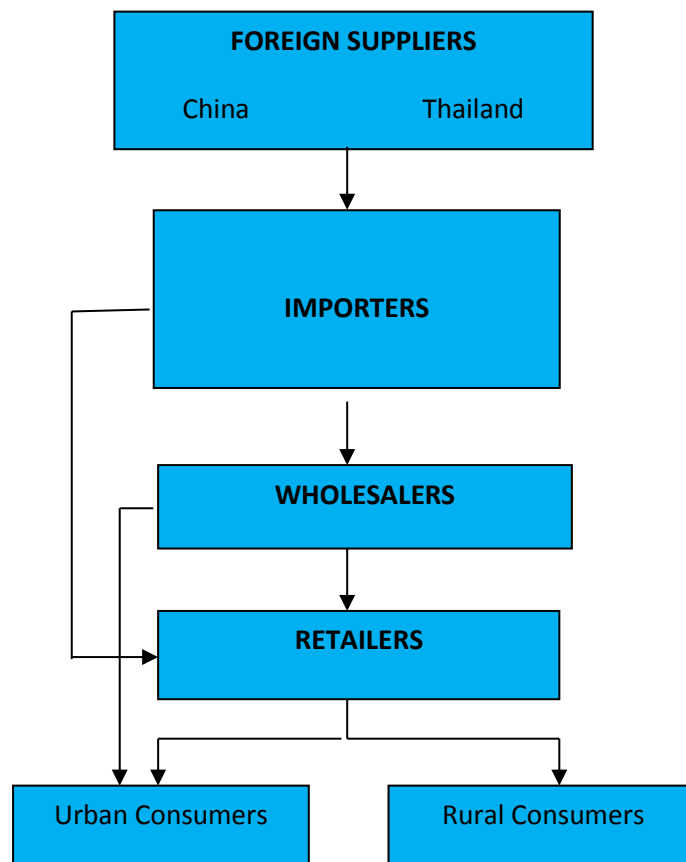
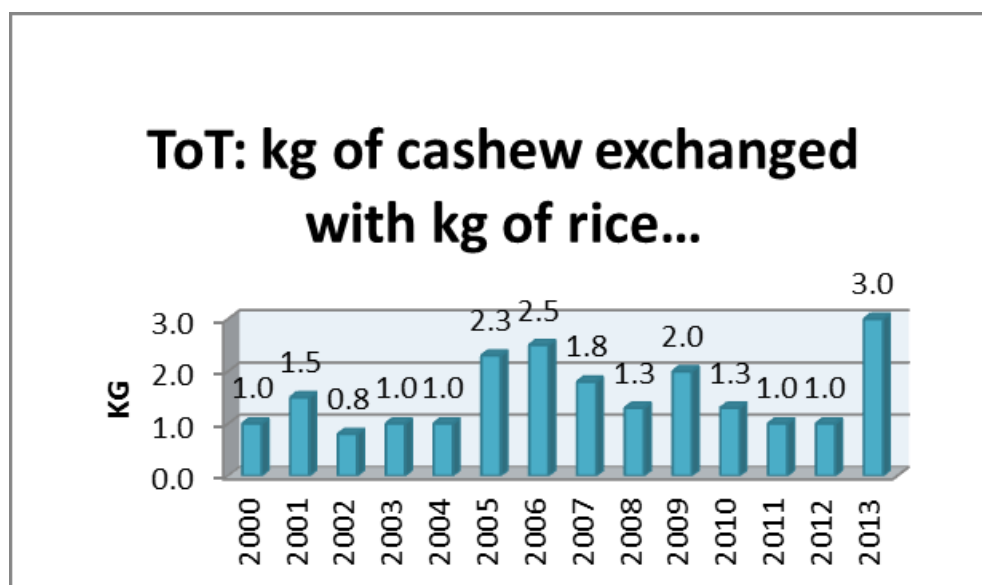


Figure 2: Marketing Channels for Imported Rice in Guinea Bissau

It is important to emphasize that the two points above relate to the expected impact of changes in border taxes or fees on rice – i.e. policies which directly affect the ex-port landed price of imported rice. Other policies which seek to affect domestic rice prices via expanding the supply of locally produced rice cannot hope to achieve anything so long as the economy remains open to imports which compete with domestic production. Again, the analysis is so well known as to not require repeating here, but so long as the urban retail price is anchored by the world price then increased domestic production can only increase the proportion of local rice in the market, and not its price. Local producers could certainly gain, but consumers would not.

**Figure 3: Cashew/Rice Barter Terms of Trade in Guinea Bissau**



Source: WFP Synthesis of Rapid Food Security Assessment – Guinea Bissau June 2013

### *C. The non-existent middlemen – Implications of a dysfunctional marketing system*

One of the key problems facing any effort to affect rural welfare via price incentives is the inability of the marketing system to actually transmit these prices to the household level. On a basic physical level the truly awful condition of much of the secondary and tertiary rural road network makes it literally impossible to access large parts of the countryside through many months of the year. Even in the dry season access is difficult and the physical transport of goods that would result in actual price changes doesn't happen. The PNIA (National Program for Agricultural Investment) concluded in 2010 emphasized the importance of this problem.

The role of cashew traders in bartering for product with rice rather than paying for it with cash plays a powerful role in perpetuating this situation. Why would a trader looking to buy rice from farmers for resale in towns or other rural areas risk damage to his or her own transport equipment much less take the risk of an uncertain marketing margin in a situation where demand has already been satisfied by cashew traders bartering rice for raw nuts? Furthermore, bartering for raw cashew with rice rather than paying for it means that the rural economy is to a large extent non-monetized – there is no scope for selling other items such as small consumer goods, agricultural inputs, etc. if the rural population have no cash to buy it with. Furthermore, the natural market that would be supplied by local producers: the city of Bissau and provincial market towns – are precisely the areas where importers' distributors are active in retail markets.

All of this adds up to a situation in which even if policy makers *could* affect the price of rice in the city of Bissau or in provincial capitals, there can be no expectation that this would have any measurable effect on the incentives actually facing farmers. Without a marketing system connecting them to the greater rice economy, each of them exists as an island, not just in terms of the rice market, but also in terms of the goods and services they might wish to buy if they could produce a rice surplus and monetize it through cash sale.

One other note is relevant to this discussion: the term “poor governance” must be understood to apply not only to the central government in the capital city but also to extend more generally to encompass a frame of reference shared by everyone in a position of authority no matter how small or remote. Potential marketing agents face not only adverse physical conditions and impoverished people in the countryside – they also face rapacious police and local authorities at every major intersection who exact their own “fees” before allowing passage. The extent of this is unknown but even a casual observer touring the countryside cannot help but note its pervasiveness.

#### *D. Welfare considerations*

The most important fact about the welfare effects of rice price changes is that (unlike cashew) the country has significant numbers of poor who are net sellers while at the same time there are significant numbers of poor who are net consumers. Clearly, any change in rice prices will have a short run benefit to one group but a loss to the other group. In particular, any attempt to provide an immediate benefit to poor populations in rural areas might well center on either lowering the price of rice, or equivalently, increasing the quantity of rice to be bartered for a given amount of raw cashew.

Unfortunately, and inevitably, any attempt to do this (if it can even be successfully achieved) would have an adverse impact on all who grow rice and/who could potentially grow rice in the future. In contrast, efforts to increase rice production via improved seed, better technology, improved roads, etc. would provide benefits to growers by lowering their costs of production while avoiding negative consequences for consumers. At worst (from the consumer point of view) prices would remain linked to the international market via the effects of the large share of domestic consumption that is imported while the supply of the preferred domestic rice varieties is expanded.

#### *E. Graphical Analysis*

To help clarify the discussion above, Figures 4, 5 and 6 show a graphical analysis of the rice market both in the short run and in the long run as well as the cashew market.

Figure 4 shows the current situation in which rice is imported at two different prices set by the government based on their ability to alter taxes, fees, and also to impose requirements on rice importers. At a high import price, domestic production is at point A while domestic consumption is at point B. If, as proposed, the government were to impose a lower import price, then production would be lower at point C while consumption would rise to point D. The important aspects to note are that while consumers would clearly gain (consuming more rice at a lower price) producers would lose, selling less rice and getting a lower price for it. This analysis presumes that the government will forgo the various fees and taxes in order to make this lower price effective.

If the government does not absorb the cost of lowering the price of rice, and simply forces the price decrease on importers, the ramifications are rather more complex. On the consumption side, if consumers also face the lower price then they will behave as above in Figure 4 and consume a greater quantity at a lower price. However, the rice/cashew traders now face a situation in which de facto they are facing a higher price for cashew and will therefore act accordingly.

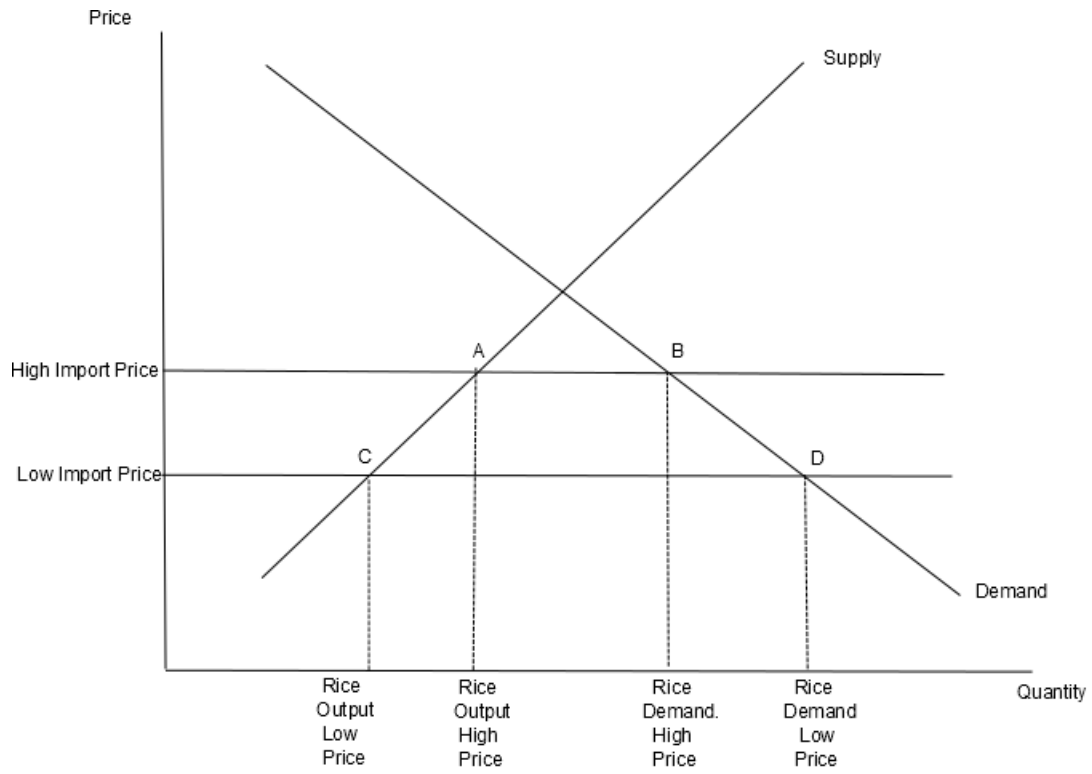
Figure 5 shows a depiction of the market for cashews in which the price of cashews is the barter terms of trade between rice and cashew. The supply curve represents smallholder production of raw nuts while the demand curve, labelled ED, is the demand of exporters for these nuts. Without any government intervention in the market we see an initial equilibrium at point A with (for the sake of argument) an initial barter terms of trade of 1 kg of rice for 1 kg of raw cashew.

If the government wants to enforce a higher price (say, 2kg of rice for 1 kg of cashew) it can do so in one of the two ways discussed above: It can either absorb the cost itself by eliminating fees and taxes or it can force the rice/cashew traders to absorb the loss themselves. We can see clearly the difference between the two cases, first where the government absorbs the cost of cheaper rice and second when the lower price is instead forced on the traders who import rice to exchange it for cashew.

In the first case, the effect on the cashew market is quite simple – Offering more rice in exchange for cashew is in effect a higher price and should elicit greater production. If the cashew exporters are bearing no extra costs, then their effective demand is shifted out by the amount of the subsidy to ED\* and there is a new equilibrium production and export quantity at point C.

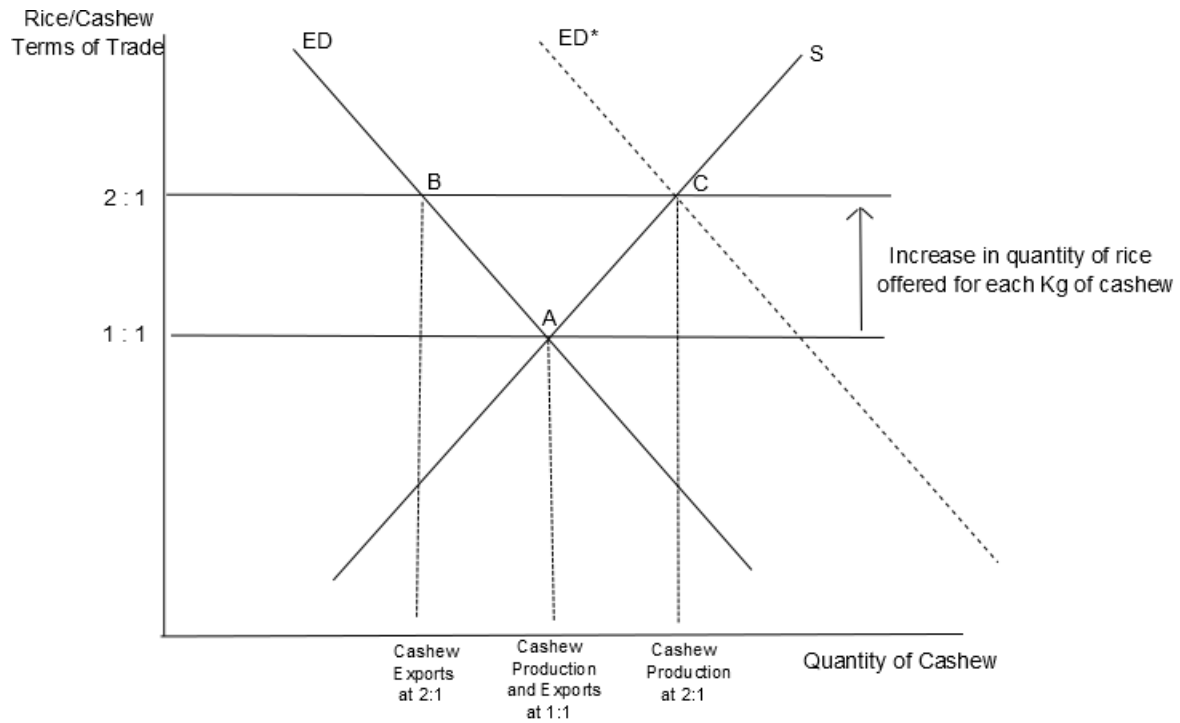
If, on the other hand, exporters are forced to pay the higher price themselves, it is equivalent to simply moving back up their demand curve and they will only want to purchase the amount indicated graphically as point B. The difference between production and purchases, B-C, is excess supply that is not bought by traders. This is clearly not a solution to the problem at hand, nor will it achieve the government's goals: The government will not have an expanded export volume which can be taxed, and growers will be reluctant to produce product that ends up unsold.

**Figure 4**



The Market for Rice  
in the Short Run

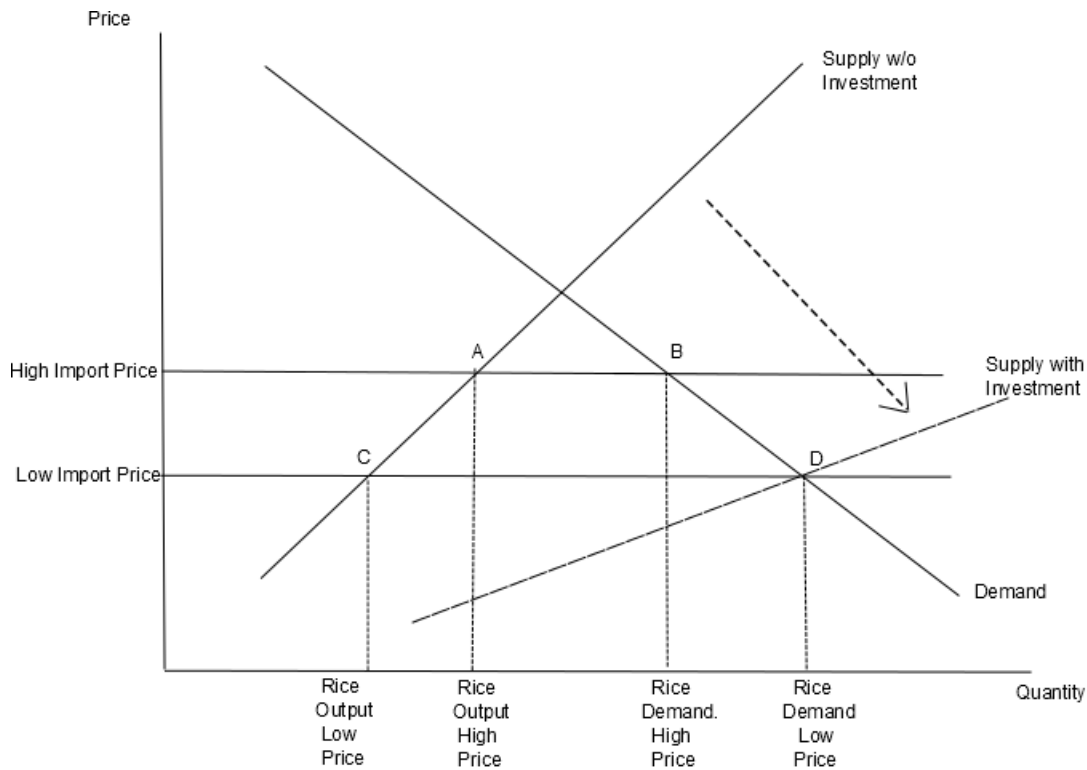
**Figure 5**



Response of Cashew Supply and Exporter Demand for Cashew to Enforced Change in Terms of Trade Between Cashew and Rice

Figure 6 shows a longer term view of the rice market in which investment in increased production (See alternatives discussed below in the next section) shifts the market supply curve to the right. The graph as drawn shows supply expanded to the point where domestic production can satisfy all of domestic requirements at the lower of the two prices from Figure 4. It is important to note that all during the traverse from the initial production point A (or C at the higher import price) to the production point D (or B at the higher price) internal prices are still governed by the world market price – the only adjusting mechanism is the quantity imported which will depend on the difference between domestic supply and domestic demand at the world price. Indeed, the world price would continue to be the operative domestic price even if the domestic supply expands sufficiently to generate exports to the right of point D (or B at the higher price) with the quantity still performing the role of adjustment, though via export quantities rather than imports.

**Figure 6**



The Market for Rice  
in the Long Run with  
Investment in Productive  
Capacity



## **IV. Rice in Guinea Bissau in the Long Run**

### *A. Does Guinea Bissau Have a Comparative Advantage in Rice Cultivation?*

Guinea Bissau is essentially an estuarine country. That is, a large percentage of the country is composed of areas which are well watered and through which various river deltas pass. Traditionally, many of the ethnic groups comprising the majority of the population have been centered on rice cultivation, meaning that the human capital inherent in long term cultivation of a crop is well developed. Rice is well known, and the “tricks of the trade” useful in cultivating it in traditional ways are well known. This means that adoption of improved rice growing technologies should be relatively easier to promote than in areas where the crop is unknown.

Recent measures of comparative advantage were provided in the Diagnostic Trade Integration Study for Guinea Bissau completed in 2010. While these estimates were of necessity based on extremely sparse data and only very limited surveys of production areas, the results were nevertheless strong enough to make very clear that Guinea Bissau has a strong comparative advantage in rice production. Tables 6, 7 and 8 below, taken from Spencer and Djata 2008, shows that both lowland irrigated rice and traditional mangrove production systems have very markedly favorable Domestic Resource Cost estimates. DRC’s are generally accepted as reasonable empirical indicators of comparative advantage, and we present here estimates both for DRC’s in Guinea Bissau and also for other countries in the region producing rice.

Realizing the potential indicated by the DRC calculations will require investment. These are discussed below. However, it is worth noting at the outset that though there are some short run interventions that would make a difference, there should be no illusions that results with a detectable macro impact could be expected within a short time span.

### *B. Farm level interventions*

- Improved seed - The first and most obvious intervention at the farm level is the introduction of improved varieties of seed adapted to local conditions. This is a clear case of “low hanging fruit” in that Guinea Bissau has not had a significant agricultural research capacity for a period of decades. This means that there are significant “off the shelf” improvements which could be readily adapted for introduction at the farm level. While this is obviously not something that can be done from one year to the next, it is equally clear that the potential gains are very large. The Africa Rice Center (formerly the West African Rice Development Association) is the most obvious point of contact for this and the relationship between them and the Guinean research establishment should be funded and promoted as a matter of the first priority.

Table 6: Estimated competitiveness of existing rice production systems in a normal rainfall year with 2007 rice prices

INDICATORS	Mangrove Swamp - N	Mangrove Swamp - S	Irrigated - Rainfed	Irrigated – Pump	Lowland	Upland
<b>Farm/Plot Size (ha)</b>	2.62	4.20	0.62	0.70	0.50	1.20
<b>Family Labor per ha (person days)</b>	319	184	1,755	923	1,148	906
<b>Hired Labor per ha (person days)</b>	74	29	29	29	29	23
<b>Paddy Yield (Kg per ha)</b>	2,200	2,200	3,500	5,500	1,000	500
<b>Returns to Fam Lab per farm (CFA)</b>	490,212	805,625	202,707	159,334	14,150	-2,392
<b>Returns to Fam Lab per ha (CFA)</b>	187,104	191,815	326,946	227,620	28,301	-1,994
<b>Returns to Fam Lab per day (CFA)</b>	587	1,045	186	247	25	-2
<b>Private Profits (CFA/kg) (PP)</b>	189	249	204	205	104	76
<b>Social Profits (CFA/kg) (SP)</b>	100	161	130	127	45	-47
<b>Private Cost Ratio (PCR)</b>	0.19	0.15	0.16	0.24	0.30	0.37
<b>Domestic Resource Cost (DRC)</b>	<b>0.45</b>	<b>0.33</b>	<b>0.35</b>	<b>0.43</b>	<b>0.65</b>	<b>2.40</b>
<b>Nominal Protection Coeff (NPC)</b>						
- On tradable Outputs	114.29%	114.29%	114.29%	114.29%	114.29%	114.29%
- On tradable Inputs	92.75%	87.34%	90.20%	75.18%	111.32%	84.06%
<b>Effective Protection Coeff (EPC)</b>	129.16%	121.43%	121.72%	120.94%	118.55%	358.08%

Notes:

- PP = (Private Revenue - Overall Costs @ market prices)
- SP = (Social Revenue - Overall Costs @ social prices)
- PCR = (Non-Tradable Costs) / (Revenue - Tradable Costs) @ market prices
- DRC = (Non-Tradable Costs) / (Revenue - Tradable Costs) @ social prices
- NPC = (Private Revenue @ market prices) / (Social Revenue @ social prices)
- NPC = (Tradable Costs @ market prices) / (Tradable Costs @ social prices)
- EPC = (Private Revenue - Tradable Costs @ market prices) / (Soc Rev - Trad Costs @ social prices)

Table 7: Estimated competitiveness of existing rice production systems in a bad rainfall year with 2007 rice prices

INDICATORS	Mangrove Swamp - N	Mangrove Swamp - S	Irrigated - Rainfed	Irrigated - Pump	Lowland	Upland
Farm/Plot Size (ha)	2.62	4.20	0.62	0.70	0.50	1.20
Family Labor per ha (person days)	319	184	1,755	923	1,148	906
Hired Labor per ha (person days)	74	29	29	29	29	23
Paddy Yield (Kg per ha)	1,800	1,800	3,000	5,500	800	400
Returns to Fam Lab per farm (CFA)	333,012	604,025	165,507	159,334	2,150	-16,792
Returns to Fam Lab per ha (CFA)	127,104	143,815	266,946	227,620	4,301	-13,994
Returns to Fam Lab per day (CFA)	399	783	152	247	4	-15
Private Profits (CFA/kg) (PP)	163	236	195	205	54	19
Social Profits (CFA/kg) (SP)	72	147	119	127	-1	-115
Private Cost Ratio (PCR)	0.22	0.16	0.17	0.24	0.46	0.71
Domestic Resource Cost (DRC)	0.53	0.36	0.37	0.43	1.01	-2.36
Nominal Protection Coeff (NPC)						
- On tradable Outputs	114.29%	114.29%	114.29%	114.29%	114.29%	114.29%
- On tradable Inputs	92.75%	87.34%	90.20%	75.18%	111.32%	84.06%
Effective Protection Coeff (EPC)	135.76%	123.57%	123.43%	120.94%	122.62%	-185.58%

Table 8: West African DRC Comparisons for Rice

Country	Rice System	1978	1996	2003	2006	2007
Cote D'Ivoire	Irrigated	1.68	0.73			
Mali	Irrigated	0.69	0.40			
Senegal	Irrigated	1.66	1.12			
Sierra Leone	Irrigated	0.83	0.70	0.20		
	Mangrove	0.84	0.42	0.68		
Guinea Bissau	Mangrove					<b>0.33</b>
	Irrigated					<b>0.43</b>
	Lowland					<b>0.65</b>
Liberia	Lowland				0.30	

Sources: Spencer and Djata 2008

- Infrastructure - On-farm infrastructure is a key necessity for reestablishment of the domestic rice production capacity. Dykes and sluiceways in the mangrove production system as well as improvements in irrigated perimeters already envisioned in existing project proposals can make a significant long term difference to Guinea Bissau's food balance. It is important to note that labor availability is a very important constraint to realization of this potential. This is particularly so with respect to initial infrastructure works where project assistance can do much to help create adequate initial conditions for reactivation of production.

However, there are also heavy labor requirements in any of the favored rice production systems (mangrove, irrigated or lowland). There has been a presumption in recent discussion that this labor requirement has been a zero-sum problem where farm labor cannot be allocated to rice because it has been allocated to more profitable cashew instead. There are several important observations and caveats to this view of the problem:

1. No actual labor allocation research has established that this tradeoff really exists or is binding. Indeed, cashew is grown in many other SSA countries in conjunction with staple grains and nowhere else is this tradeoff seen to be a major problem. Therefore, it is worth looking at the Guinea Bissau situation a bit more closely to determine what the real constraint is.

It is important to recognize that there are actually two separate labor allocation issues. The first is the one-off labor inputs needed to reconstruct the various dykes, sluiceways and other infrastructure needed for rice production. Cashew similarly requires one-off labor inputs to establish plantings but in neither case do these inputs recur on an annual basis. The second question is whether, once established, the two crops compete with each other for labor inputs. Rice is obviously a labor intensive crop as grown in traditional systems in Guinea Bissau and elsewhere while cashew is able to be produced with minimal labor inputs once trees are established. Though some cultural practices are recommended (pruning, etc.) they are not required for low levels productivity.

2. If, as seems reasonable, the primary goal of rural households is to ensure adequate food availability, then there really is no mystery why labor is allocated to cashew but not to rice:

- Cashew traders are a reliable source of rice supplies and demand raw cashew as payment for it
- Rice production systems are in a state of disrepair; further, inputs (including seed) are often unavailable and/or not available in a timely manner.
- Marketing systems for sale of on-farm surplus rice are rudimentary at best and non-existent in many areas

All of these considerations make it clear that allocating labor to cashew and not to rice is very possibly a perfectly reasonable response to the high cost of reestablishing rice infrastructure coupled with the relative difficulty in marketing rice surpluses, together with the ready availability of a crop – cashew – which requires much less in terms of up-front inputs of labor and capital to establish viable production systems.

But this is not something that is immutable or incapable of being affected by policy and investment. Indeed, the DRC calculations for rice discussed above, together with the obvious failures in infrastructure repair, input supply and marketing suggest that BOTH rice and cashew are potential money makers for rural households and that BOTH crops would be grown if there were reasonable conditions, both institutional and in terms of infrastructure for growing both of them.

However, at the present time the very high cost of reconstructing rice infrastructure prevents progress in this area. The relatively low cost of propagating cashew presents no such problem, and the result is a heavy reliance on cashew production for rural incomes. But it bears emphasizing that this is a situation that is capable of being overcome if the necessary one-off infrastructure investments can be made, perhaps with outside assistance.

### *C. Off farm interventions*

Rural Roads – Though Guinea Bissau has an adequate system of primary highways in many areas of the country it would be difficult to overemphasize the abysmal state of secondary and tertiary rural roads, or the importance of improving them. Until this is accomplished it can be taken for granted that many areas in the southern “breadbasket” will remain isolated through the rainy season and accessed only with difficulty the rest of the year. Isolation implies that they cannot respond to incentives and cannot integrate with the larger national economy.

Marketing System - As noted above, the non-existent rural marketing system prevents farmers from even seeing market signals, much less allowing them to respond to them. Establishment of a rural marketing system has as a necessary condition the improvements in roads noted above, but also includes additional measures such as improved security in rural transport, better governance and control of petty corruption, improved credit availability and market infrastructure.

### *D. Services*

As noted above, both research and input supply are areas where a concerted effort is needed to achieve minimum conditions for an output response in terms of marketed rice. Extension services to make this possible are currently near non-existent. Given the difficulties in establishing government run extension services that can be relied on to adequately address these issues on a sustained basis, there is reason to promote the use of NGO’s with experience in performing these kinds of functions.

Indeed, given the fact that interventions and improvements are needed along virtually the entire supply chain, from infrastructure through seed, cultivation, and marketing, there is a likelihood that coordination of all of these efforts would require an implementing organization capable of encompassing them all since failure of any one of the links could (and in the past probably has) render the whole effort a failure. Thus, a filiere approach as has been used with some success in other neighboring countries could be usefully considered here.

## V. What Does This Mean We Can or Should Do Now?

### A. *Short Run Options are Limited*

The bottom line is that there is only so much policy can accomplish if the basic productive capacity is undeveloped – and that is exactly the situation we see in the rice sector in Guinea Bissau. Though there is a strong comparative advantage and a long historical record of rice production, the current situation is one where much of the available resource base is unused and the potential that is clearly there is not readily accessible.

#### Can manipulation of the retail price of rice alleviate poverty?

In terms of poverty alleviation there are no easy levers to pull when large segments of the poor population are:

- producers and so are made worse off when prices go down
- consumers and so are made worse off when prices go up
- trying to have it both ways (high prices for producers but low prices for consumers) is prohibitively expensive in terms of the cost of such a subsidy
- Supply response in rice is inhibited both by the very high front-end cost of rehabilitating rice infrastructure as well as the difficulties posed by the extremely low level of development of the rural marketing system

Short run price policy then becomes a political exercise in choosing which group to assist and which to damage. No easy solution is available.

#### Can the government even hope to successfully manipulate the rice price?

In short, no, and for two reasons:

- Guinea Bissau is an open economy; the international price will continue to be the anchor for domestic rice prices as long as a large share of domestic

consumption is imported, and will continue to be the anchor if the country makes enough progress to become an exporter

- The dysfunctional marketing system means that transmission of urban prices to rural areas cannot be taken for granted – Not only will producers fail to respond to incentives they do not even see, but they can do little to affect the domestic production/consumption balance if their potential surpluses cannot be marketed.

It might be tempting to say that a dysfunctional marketing system means that a lower rice price would benefit consumers while not materially affecting producers. However, this is a very mistaken presumption for three reasons:

- A subsidized rice price is a policy that has been tried in many places and times and which has well known problems associated with it. Basically, there is no easy ‘exit strategy’ from such a policy. It is expensive and can come to dominate what balance can be achieved in government spending and revenue, and the political economy of the policy creates extremely powerful vested interests in its continuation.

- To embark on such a path means giving up on the idea of promoting domestic production. Improvements in seeds, infrastructure, etc. cannot hope to bear fruit if the rewards for making these improvements are limited ex ante through price policy.

- Finally, the rice/cashew barter system that is common in Guinea Bissau today complicates such a policy immensely. Trying to force an “improved” barter terms of trade on cashew traders and the rural economy amounts to little more than a roundabout tax on cashew trade and has the very real potential to damage the cashew trade without significantly helping improve rice availability.

### *B. What to Do?*

The above difficulties in implementing a short run price policy capable of improving welfare in rural areas do not mean that there is nothing that can be done. Rather, they mean that there are few easy or painless policies in a situation where there really is very little scope for



improvement without an improvement in basic productivity. In short, there is no “free lunch”. Nevertheless, the strong comparative advantage that has been estimated in recent studies in Guinea Bissau and demonstrated over the course of history suggests that a longer term policy based on comparative advantage could well start to yield positive returns sooner than many might imagine. Among the initiatives that could be considered are:

- Implement a project aimed at providing assistance for the investments needed to rehabilitate rice infrastructure. This is an area where outside help in the form of project aid could make a real difference.
- Push for a research/extension effort to promote improved rice varieties in both mangrove and lowland rice production systems. Guinea Bissau has not had an effective capacity to take advantage of existing off-the-shelf seed improvements for a period of decades. Current yields are well below those that have been demonstrated to be attainable in other African countries, particularly in mangrove production systems. Given the fact that only local adaptation is required (that is, the basic research and breeding lines already exist) this can be expected to yield benefits as soon as it can be extended to farmers.
- As discussed at length above, we cannot expect farmgate incentives to be effective until the dysfunctional marketing system is addressed; It would make sense to start planning for an integrated research/extension/marketing development plan that could be implemented by NGO's (to avoid governance issues)
- Rural road improvement is a key element of any successful long term strategy. Though this is not an area where improvement can be expected overnight, and though road improvement is obviously quite expensive, there really is no way to avoid this issue. Fortunately, Guinea Bissau is relatively flat and relatively small. Donor assistance could go far toward addressing these problems as they clearly have in the area of primary roads.
- Efforts to monetize rural economy should be looked at carefully to alleviate short term crisis vulnerability. One sure way to provide an incentive for marketing system development is to inject cash into the local economy. In addition, the need to move beyond the current pure barter system where rice is exchanged for raw cashew is unavoidable. As a purely short term crisis response, this has much to recommend it.

For the foreseeable future the cashew price will remain the single most important policy lever for the rural economy in Guinea Bissau. The higher it is the better for smallholders; The more stable it is the less risk is transmitted to rural economy. The fact that world cashew price fluctuations can severely impact rural areas in Guinea Bissau even to the point of provoking a crisis points to the need for diversification and development. Unfortunately, there are no easy answers in terms of policy options for food crops to counterbalance these problems. The experience of the past years shows clearly that there are major problems associated with attempts to manipulate and/or extract rents from the price at which cashews are traded. Adding policies which attempt to manipulate the prices of still more crops will most probably simply add new problems to the situation without resolving any of the existing problems.

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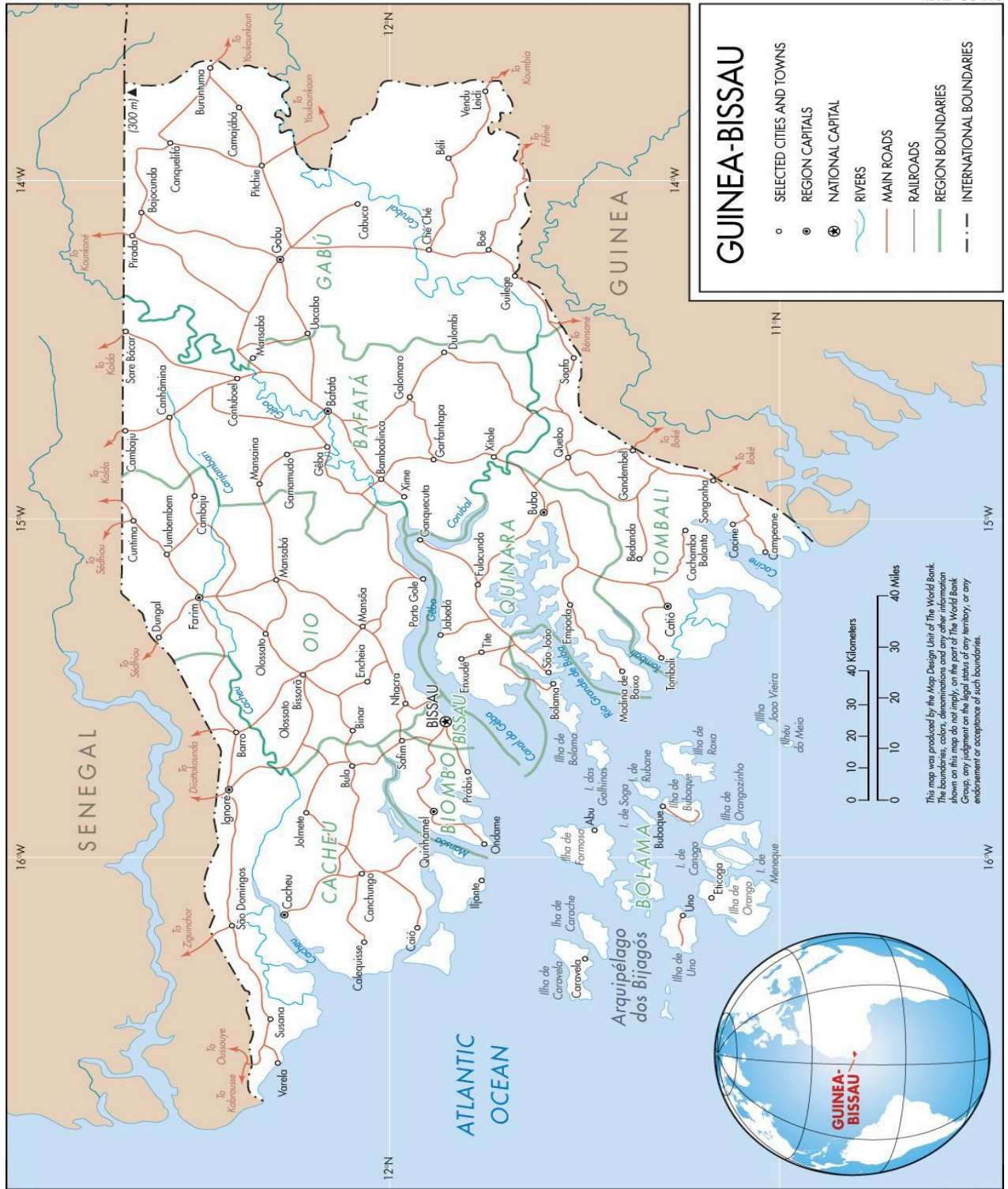
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