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Minor Field Study

Efficiency of the rice market channel in the Office du Niger

Master thesis NEKM01

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Abstract

The Office du Niger is the most important rice production area in Mali. It plays an important role in ensuring food security for the country's rapidly growing population. In order for the Office du Niger rice sector to keep supplying consumers with sufficient amounts of rice, an efficient market channel (i.e. the chain through which the rice must pass from producer to final consumer) is needed. In an attempt to meet the growing demand for rice the Government of Mali in 2008 launched the "Rice Initiative" program, which principally consists of heavy subsidization of fertilizer and improved access to input credit. This thesis evaluates the efficiency of the market channel of the Office du Niger. It also briefly evaluates how it has been affected by the Government's "Rice Initiative" program. Evaluation is done through analysis of the structure and reforms of the Office du Niger rice market channel, with a main focus on efficiency in terms of competition, concentration and vertical coordination between market channel participants. Lastly, it assesses the effect of the "Rice Initiative" program on this level of efficiency. The thesis concludes that the level of competition in the market channel is very high, but that coordination is lacking. Efficiency could be improved if vertical coordination were to be encouraged, at the cost of higher market concentration and decreased competition. This should be considered when further developing the "Rice Initiative" program.

Key words: Rice, Office du Niger, Concentration, Coordination, Competition, Market channel, Agricultural policy, Subsidization

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List of abbreviations

BVG Bureau du Vérificateur Général

CIR Cellule Initiative Riz

CIRAD Centre de Coopération Internationale en Recherche Agronomique pour le Développement

DNCC Direction Nationale du Commerce et de la Concurrence

IER Institut d'Économie Rurale

IR Initiative Riz (Rice Initiative)

OMA Observatoire du Marché Agricole

ON Office du Niger

OPAM Office des Produits Agricoles de Mali

PRMC le Programme de Restructuration du Marché Céréalière (Cereal Market Restructuration Program)

SSA Sub- Saharan Africa

VA Village Association

VC Vertical Coordination

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1. Introduction

1.1) Background and purpose of study

Mali has one of the highest population growth rates in the world. This, in combination a shift in dietary habits in favor of rice, means demand for rice is continuously increasing. The Government of Mali's latest approach to this challenge is a large subsidy on fertilizer combined with improved access to input credit under the so called "Rice Initiative" program.

As world market prices for rice peaked in 2007 with a 19- year high, it implied a serious threat against food security and an aggravated trade deficit. However, this price increase, in combination with an earlier privatization of the rice sector, also meant that the market prospects for domestic producers improved. So did the opportunities for Mali to exploit its comparative advantage in rice production. In this context the Government of Mali (GOM) has introduced the Rice Initiative ("Initiative Riz") program in an attempt to increase domestic production in such a way that self-sufficiency can be reached. This is an ambitious goal given the ever-increasing demand.¹

If domestic production cannot suffice, Mali will become dependent on ever-increasing quantities of imports in order to ensure food security. Imported rice presently accounts for about 15% of total consumption. In order to avoid imports (i.e. to achieve self sufficiency), the Malian rice sector must be viable and able to sustain production growth over time. In this context the Office du Niger production area, being by far the largest and most efficient in the country, plays a crucial role in achieving self sufficiency. The efficiency of its market channel will determine how well it can continue to respond to future changes in demand.

¹ (Baris, Zaslavsky and Perrin (2005: 7) estimate a minimum growth in demand for rice of 3.5 % annually, which would imply that in order to be self- sufficient, Mali would need to produce 275 000 tons of rice by 2015, and by 2020 the need would be 430 000 tons).

The efficiency of the market channel can be evaluated through the analysis of relationships between market channel members, in terms of their ability to coordinate actions along the market channel, as well as the level of concentration and competition between them.

The purpose of this thesis is to evaluate the performance of the Office du Niger (ON) sub sector in terms of economic efficiency. It also aims at evaluating the effect on the level of efficiency of recent market measures undertaken by the GOM, notably the subsidies under the Rice Initiative program. This is done by answering the following research questions;

- How efficient is the rice market channel of Office du Niger in terms of coordination and competition?
- How is efficiency affected by the Government of Mali's "Rice Initiative" program?

Chapter two provides the theoretical framework of the thesis. Chapter three describes the Office du Niger Market Channel, its structure, and the reforms that have shaped it. It also introduces the Rice Initiative program. Chapter four analyses the efficiency of the market channel by the level of coordination and concentration, and their effect on process- and outcome indicators. Chapter five analyses the effect of the Rice Initiative on the market channel. Chapter six concludes the thesis.

1.2) Methodology and delimitations

The most desirable for this type of study would have been a statistical survey with standardized questionnaires and a large sample of stakeholders in the market channel in order to explore their economic margins, their linkages to other stakeholders etc. This has not been possible given constraints in time and resources. This thesis is therefore a qualitative literature study using quantitative data and interviews as complements to support or contradict the findings in the literature reviewed.

I use a theoretical framework based on the recent economic research describing the market channel in terms of the degree of vertical coordination, concentration and competition between

channel members, and their effect on the performance of a number of key indicators used to measure efficiency of the market. The theory is interesting as it to some extent contradicts the traditional economic theory where a market with perfect competition leads to Pareto- efficient allocations of resources. Instead, it suggests a trade- off between concentration and competition in order to reach the best possible coordination in the market channel. It is based on empirical findings, which is why I have found it reliable.

In order to find some indicators with which to analyze the level of efficiency, I have turned to the only source providing such a tool. Poulton distinguishes between *process indicators* and *final outcome indicators* to evaluate competitiveness (i.e. efficiency) of a sector. Process indicators such as input provision, quality control, credit recovery, extension, and research are thought to influence final outcome indicators like yields, returns to farmers, cost efficiency, overall competitive position in the market, and macro impact. This framework is used to assess the change in concentration and vertical coordination between the actors of the sector resulting from the Rice Initiative, and the effect of this change on the indicators. It would have been desirable to have compared this framework with other sources, providing other suggestions for which indicators to look at, but I have not found any.

As for the interviews, I have tried as far as possible to cover the various indicators analyzed. At the Malian Ministry of Agriculture, an interview was conducted with the Rice Initiative Unit (CIR) which is responsible for the implementation of the RI. In the ON administration, I interviewed Fafré Diarra at the technical unit in order to gain knowledge of equipment used, fertilizer, quality, and production credits. At the regional chamber of Agriculture in Ségou a group interview was held with the director and his staff, also on the topic of production credit, fertilizer, and the RI. From the private sector, interviews were conducted with two credit institutes (CVECA and FCRMD) in order to gain information on credit repayment and the functioning of the system of production credits and the effect of RI on it. Two semi- wholesalers of the Niono market and two farmers were also interviewed separately. The farmer interviews were not used since the farmers had been chosen by the ON administration and I feared their answers were biased. At the importer/wholesale level I interviewed a representative from Groupe Ami, one of the four large importers/wholesalers in the market. I regret not having interviewed any retailers. I also interviewed the director of Faranfasi So, a cooperative providing extension

services to farmers. Finally, the interview with the National Direction of Trade and Competition (DNCC) was thought to provide information on the level of competition, concentration and coordination in the market channel. Interviews were not standardized, since I have sought different types of information from each interviewee. I have at times suspected answers in some of the interviews to be unreliable, and have therefore, as far as possible, tried to compare these answers with information in other sources or interviews. Where comparison has not been possible, I have not used the information in question. Answers in interviews also differ widely regarding some issues, for example the number of farmers ineligible for production credit.

The collection of statistical data and reliable documentation has been difficult, given the lack of proper documentation shown by Malian governmental agencies. In combination with the lack of conformity in the answers in interviews, this has in turn made the analysis difficult. In the case of local price trends, no exhaustive data was available for lower quality domestic rice. I have therefore used price trends for better quality Gambiaka, although a lower quality variety would have been preferable. I have not had access to good enough data to be able to assess cost efficiency and macro impacts.

2. Agricultural market channels - Theoretical aspects

The agricultural market channel and its functioning are described below in terms of vertical coordination, concentration and competition. The chapter concludes by discussing how an efficient market channel is defined. This will provide the theoretical framework of the thesis.

2.1) Defining the market channel

The market channel can be seen as a set of interdependent organizations involved in the process of making a product or service available for consumption or use. The process connects producers and final consumers and influences competition and prices within the market. Johnson et al. (1996:119) considers the link between the actors involved in the transformation of a good as a *chain or a sequence* where the different steps, through which a product must pass to reach the final consumer, are analyzed. In an agricultural context this typically means producing, collection, processing, storing, transporting, wholesaling and retailing of the good in question.

2.2) Vertical coordination in the market channel

Definition of vertical coordination

Vertical coordination refers to strategies undertaken to make actors of a market channel work towards a common goal. Requirements on standardization of output as a result of increased competition, higher demands of consumers for quality and safety, and stricter legislation on safety and quality aspects of agricultural products have strengthened the need for coordination in agricultural markets, both in developed and in developing countries. (Bijman et al 2008:4)

Sporleder (1992:1227) describes a *vertical coordination spectrum* where open markets with *spot market exchanges* lie on one side of the spectrum, and *complete vertical integration* on the other side of it. In the case of spot market exchanges, the price is the only coordinating mechanism. In the case of vertical integration, hierarchical decision- making within a system or a firm coordinates all functions. Swinnen and Maertens (2007: 91) describe this degree as lying on a scale between 0 (spot market exchanges where bargaining takes place in every transaction, and no vertical relationships are established) and 1 (full ownership integration, where a company coordinates all functions of the channel within its own system).

It is possible to identify three broad categories of contractual forms relating to the degree of vertical correlation; spot markets, different types of bilateral contracts, and vertical integration. For food supply chains, these categories have been analyzed in a developing country context mainly in the relationship between producers (farmers) and buyers of farmers' output (processors or traders); for example bilateral contracts in the form of contract farming, and vertical integration in the form of producer organizations (see e.g. Bijman and Wollni 2008) or plantation arrangements (see e.g. Benfica 2006). In a developed country context, the analysis incorporates retailers to a larger extent (see e.g. Dobson and Waterson 1999, or McCorriston 2002), possibly because of the growing importance of retailer concentration on markets in developed countries. Theoretical literature on vertical organization of market channels is scarce (Cotterill 2001: 682), and the bulk of the existing literature concerns vertical coordination analysis on two successive stages of a market channel, i.e. producer- processor, or manufacturer- retailer (Cotterill 2001:680). The nature of the contractual relationships between actors of the market channel determines how they share risk, and also quality and distribution to final consumers.

Coordination versus competition

In agricultural markets, processors and traders may engage in vertical coordination with farmers through supplying inputs and credit in exchange for the exclusive rights to purchase their produce. This is a result of the need of the intermediaries to secure their supply when farmers cannot provide themselves with inputs and credits, and there are no institutions to provide them either. It is also a result of the need to reduce transaction costs involved with spot exchanges. In this respect, coordination increases economic efficiency by providing access to vital inputs needed to expand production, (Swinnen and Vandeplass 2007:2), and also leads to greater financial security and risk reduction for the farmer in that the purchase of produce is guaranteed (Swinnen and Maertens 2007:10). However, the very nature of the contracts, where the processor or trader in fact becomes a monopsonist buyer of the farmer's produce, signifies an entry barrier against possible competing buyers and decreases the bargaining power of the farmer.

Competition among buyers in the supply chain has positive efficiency effects as well as positive effects on equity (rent distribution). The reason is that buyer power is restricted, so that farmers'

bargaining power increases, and buyers have to compete among each other both by offering higher prices and services like input assistance and credit programs to farmers. In this case, private vertical coordination serves as a substitute for services earlier provided by the state-controlled supply chain, and corrects market failures in terms of accessibility to inputs (Swinnen and Vandeplass 2007).

In a case like this, however, there are incentives for farmers (suppliers) to engage in free-riding. Once having been supplied with inputs or financing services by a processor, the farmer might be induced to sell his produce to a higher-bidding processor (one that has not incurred the extra cost of supplying the input services). This is more likely to occur in a situation where many processors compete for suppliers' produce, since penalty from breaking contracts in terms of lost business is not a credible threat. With many actors in the market, information is costly to spread, and it will therefore involve high costs for buyers to find out whether a farmer is honest or not. This may lead to failure of the arrangement; processors will no longer want to provide the extra services (Swinnen and Vandeplass 2007). Failures of arrangements may also arise from information asymmetries and the lack of ability to write contracts that take all possible future outcomes into account (contracts are incomplete) (Barry et al 1992: 1220). All in all, competition among buyers of agricultural produce increases productivity by improving contract terms for farmers, but input and credit programs are threatened by too fierce competition, which will harm productivity.

Poulton et al (2003:521) suggest there is a trade-off between coordination and competition in terms of system performance. The equilibrium (the optimal level of coordination) is an outcome where these two desirable objectives are balanced against each other. The efficiency of policy reform should be assessed taking this trade-off into account. Swinnen and Vandeplass (2007: 16) suggest a number of institutional arrangements that could be used in order to deal with failure of arrangements without decreasing competition. Arrangements suggested are the building of informal relationships between producers and buyers with frequent monitoring, coordination among buyers to avoid strategic cheating on contracts, and offering incentive premiums to farmers who keep to the agreements.

Goel and Bhaskaran (2006: 105) stress the special importance of *private* vertical coordination in developing country market channels. The reason is that these markets are under- developed, and their market channels complicated and fragmented. Also, the authors claim that long- term informal relationships may increase efficiency of the market channel through mutual trust and risk sharing, especially in developing countries where formal institutions work poorly and personal relationships may be valued higher than formal contracts (ibid. 2006: 107). The need for coordination also depends on market structure, the nature of the product line, and market development.

2.3) Market concentration

Definition of market concentration

Poulton and Tschirley (2009:45) distinguish between two types of sectors: “*market-based*” and “*regulated*” sectors. In regulated sectors national monopolies and local monopolies can be further distinguished. In these systems only one firm has the full market power either in the entire country (national monopoly) or over a delimited geographic area (local monopoly)

Poulton and Tschirley (2009:46) further make a distinction between competitive systems and concentrated systems within the market-based sector. Competitive systems are characterized by a large number of buyers and open market competition. In concentrated systems a few larger stakeholders exercise significant market power.

Concentration versus competition

Within many agricultural markets there has been an increase in concentration during the latest decades. Empirical studies of various sectors show that anti-competitive effects are a result of high concentration of markets, but that these effects also are more than offset by a cost efficiency effect (Azzam, 1997). Whitley (2003:1) points out that the potential costs of concentration must be weighed against the potential benefits that concentration can give rise to in order to evaluate efficiency.

According to Whitley (2003) one of the main benefits of higher degree of concentration is lower average per unit production cost as a result of economies of scale. Also, a negative correlation between concentration and cost of production can arise through the development of lower cost methods of production, which in turn expand output through increasing the market share of the stakeholder in question. It is also claimed that concentration does not necessarily need to hinder competition; instead, concentration or oligopoly may lead to a maximized level of competition as the competition between firms may not be monotonic in the number of firms. Demsetz (1995:3) further claims that it is not always optimal to assume that competitive behavior never yields oligopoly or monopoly power, although in many cases such power may be exercised not by creating entry barriers, but through the natural frictions and ignorance that characterize any real economy. If competitors succeed in finding better ways to fulfill buyers' needs or to produce a product, then the reward for their efforts is likely to be some sort of short term market power which may be associated with increased concentration. To destroy such power when it arises may reduce or even remove the incentive for progress and efficiency.

2.4) Efficient market channels

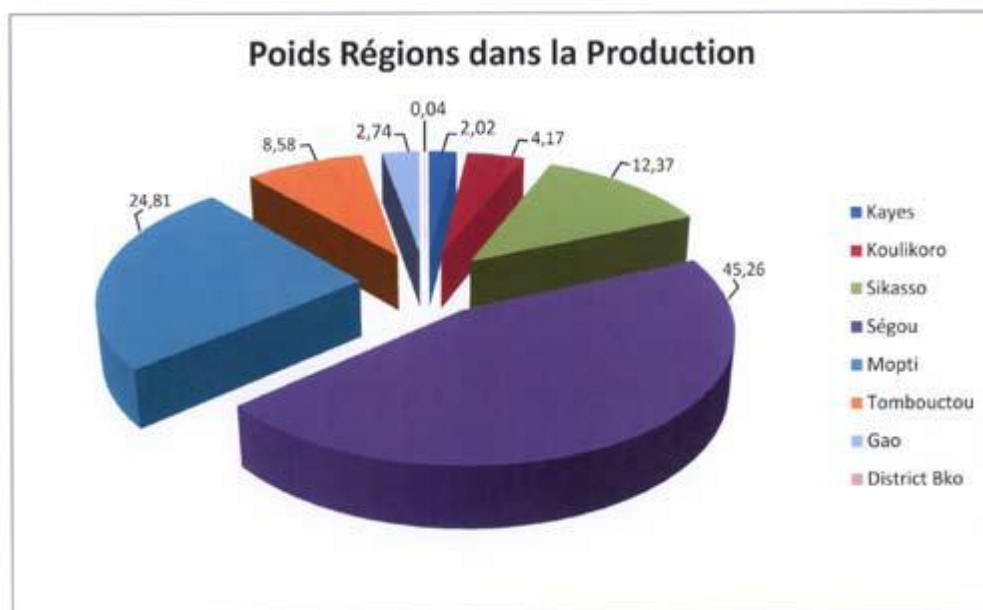
Poulton et al. (2009) draw the conclusion that fully competitive sectors initially give rise to higher prices to producers, which implies good incentives for increased production, but that they fail to provide production credit, inputs and extension services because of free riding on the part of farmers. Monopolies do secure the provision of inputs and extension, but are slow in adapting to changes in changes in market prices. Market based concentrated systems seem to be the ones showing best overall performance in input provision and price incentives for expanded production. However, concentrated systems tend to be unstable and move towards competitive systems when prices paid by existing companies decline; new companies will enter the sector, and credit and extension services will suffer. To maintain the efficiency of these systems Poulton et al. propose regulatory structures, for example the erection of entry barriers through a license system where licenses are given to those companies which can assure provision of credit and extension services to farmers (2009: 80). A system with numerous small players, and which lacks involvement of the state, will have difficulties assisting smallholders with services that allow them to raise yields and become more productive.

3. The Office du Niger rice market channel- reforms and interventions

3.1) Introduction to the Office du Niger

The Office du Niger is the largest of several government established rice production areas in Mali. It was founded in 1932 as a public autonomous enterprise, originally intended to produce cotton for the textile industries of colonial France, and to become the main production area for rice in West Africa. The Office du Niger is situated in the Ségou region in the fertile Niger delta, in which the much smaller Office Riz Ségou is also found. Together they account for about 45% of total rice production in the country.

Figure 1: Distribution of rice production in Mali, (2008/2009)



Bilan Initiative Riz 2008-2009, Ministère de l'Agriculture:16.

It is estimated that the Office du Niger alone accounts for about 40% of total domestic rice production, although the quantity produced is not to be confused with the quantity brought to market. 37 % of locally produced rice is auto consumed in the zones of production (Baris,

Zaslavsky and Perrin 2005: 22). The ON is one of the production zones where auto consumption is most important. Nevertheless, it remains the area from which the bulk of domestically traded rice originates. Also, it has the best prospects for increased production both per hectare and in total amounts given its size, its comparatively well developed irrigation system and fertile soil.

Most producers in the ON are subsistence farmers cultivating less than three hectares. The area cultivated decreases steadily over time as families grow larger.

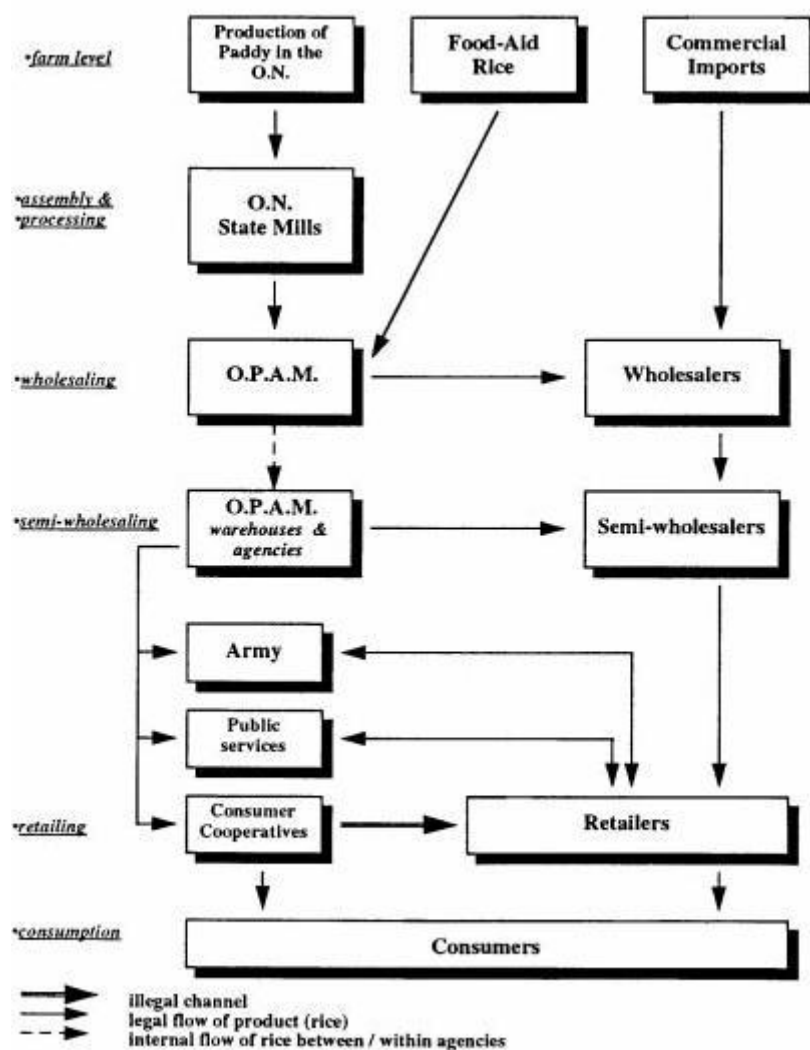
3.2) History of reforms and interventions affecting the ON market channel

State monopoly

The Malian rice sector, the ON sub sector included, was controlled by a state monopoly until 1987. The Government- owned OPAM (Office des Produits Agricoles de Mali), which handled stocking and marketing, would make advance payments to the ON. The ON would buy the rice paddy from farmers, mill it, and pass it on to OPAM. A large number of small- scale farmers were provided inputs, equipment and production credit from the monopoly/monopsony in exchange for committing to the production of rice paddy only, and the exclusive sale of output to the Office (Diarra et al 1999:2). This way, credit was always repaid.

From the mid 1970s and onwards, rice production in the ON stagnated, partially as a result of poor weather conditions and partially because of a lack of incentives for increased production. These incentives were in turn a result of poor organization of the supply chain in terms of marketing, production and processing (ibid. 1999:4). In addition to this, an overvaluation of the CFA franc in combination with import subsidization in neighboring countries encouraged smuggling of rice into Mali in the mid 1980s and hurt the competitiveness of local rice (Diarra et al 1999:7). The VC system in the ON was completely state-controlled until 1987, when the liberalization process was under way and farmers first began to sell their produce to private actors. The Office continued to provide inputs and credit services as well as guaranteeing purchase of produce up until the mid 1990s (ibid. 1999: 5).

Figure 2: Institutional structure of the ON rice sector before liberalization.



Diarra et al (1999: 8)

Liberalization

Under the pressure of the International Monetary Fund, and the World Bank, the Government of Mali agreed at the beginning of the 1980s to liberalize agricultural sectors through the PRMC (Programme de Restructuration du Marché Céréalière). The main objectives of the PRMC were to provide incentives to private actors to efficiently produce cereals, in order to attain food security (Dembélé and Staatz 1999: 8). The rice sector (and especially the ON sub-sector) had a late liberalization with an actual start in 1987 (Bonneval et al 2002:89). In the process of

liberalization, the ON eventually also ceased to provide inputs, harvest services and storage (USAID 2009: 7).

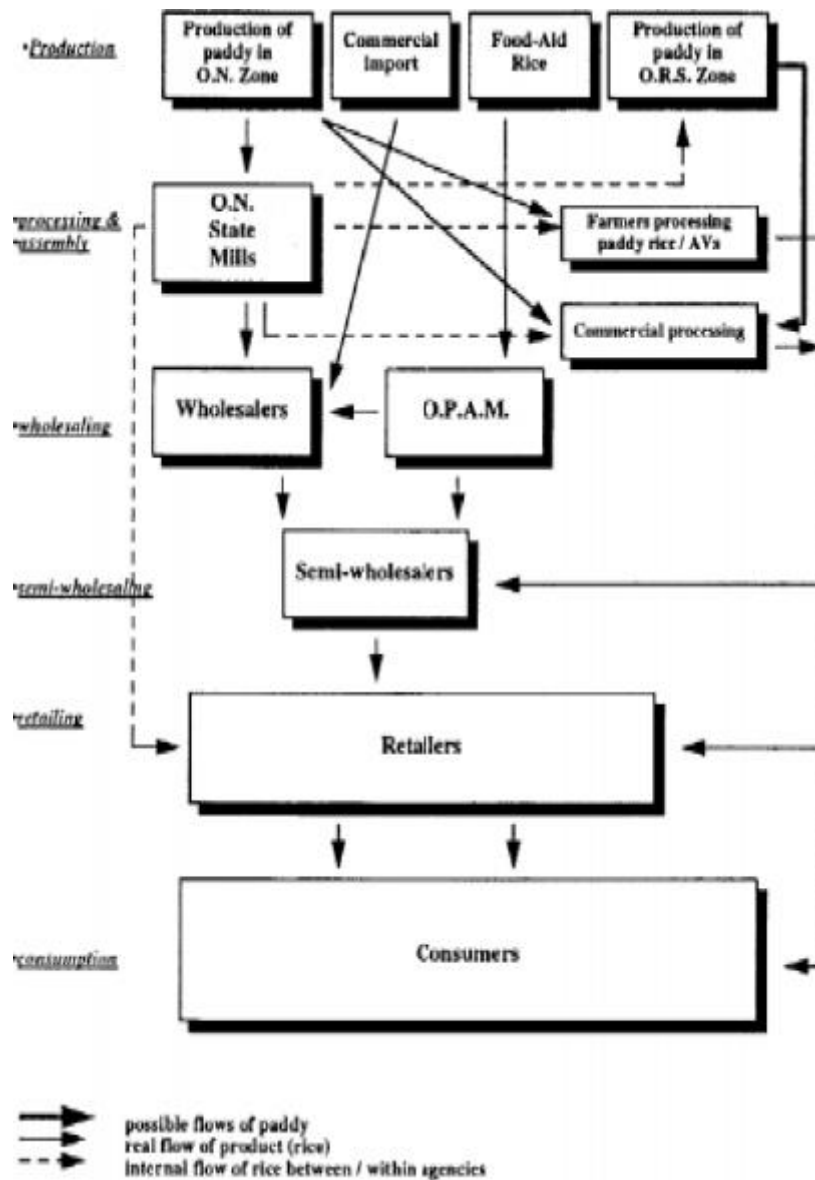
The four large state-owned rice mills were sold off to private actors. These actors were large wholesalers/importers from Bamako who controlled the totality of imported rice. Acquiring domestic rice mills also led to the complete control of the procurement of domestic rice, as well as substantial market power. Prices were jointly agreed upon and fixed by these actors in a kind of cartel behavior (Interview CIR 30.6.2010). All downstream actors had no choice but to purchase their rice from these traders. Thus concentration in the processing/wholesaling stage of the market chain was very high at the beginning of liberalization. In effect, this oligopoly/oligopsony functioned much like the late state monopoly providing fertilizer on credit to farmers, purchasing, processing, and marketing (Interview CIR 30.6.2020).

To address this problem a large number of small Chinese rice mills were eventually imported, which led to a dramatic reduction in concentration (Diarra 1994: 8). The small mills were taken over either by private independent entrepreneurs, or cooperative village associations (VAs), and quickly started decreasing the market share of the ON mills (Diarra et al 1999: 9). Farmers now had the choice of selling their paddy to private millers, or to mill it and sell the milled rice. With a substantial number of processors, market power and margins of farmers increased. In addition to a higher selling price, small rice mills also made available for farmers the by-products as fodder for livestock (Interview CIR 30.6.2010).

With the new small rice mills, smaller wholesalers and semi-wholesalers had the opportunity to purchase their rice directly from VAs or private millers (Diarra et al 1999:11). The large rice mills with their high production costs did not have much to put up in the competition with small Chinese mills and were eventually driven out of business. The large wholesalers then turned towards the international market for their supplies, and still largely do so. It seems that the number of importers/wholesalers remains at about 4-5.

Thus, at the beginning of liberalization, ON rice could travel through two different channels or segments to final consumers; one through the large wholesalers/ importers, and one more direct channel between village associations and traders in Bamako (Bonneval et al 2002: 136).

Figure 3: Institutional structure of the ON rice sector after liberalization



The small rice mills were a determining factor in increasing competition in all stages of the market channel; competition among rice millers increased revenues for farmers, competition for rice supplies among retailers secured profits for the private small mills, and increased competition among retailers as a result of free entry to the market meant lower prices for consumers (Diarra et al 1999: 11).

The decrease in concentration also brought about a corresponding decrease in private coordination, the major downside of which is a failure of the private market to efficiently provide production credit and inputs due to a lack of formal enforcement between traders and VAs. There are low incentives for actors of the market channel to enter any long term relationships (Demele and Staatz 1999: 19). During monopoly production credit was recovered through monopoly marketing of rice.

Inefficient provision of production credit and extension services leads to quality deteriorations as well as the lost opportunity to make the best possible use of land to maximize production, since production growth is highly correlated with efficient use of fertilizer. With sufficient provision of inputs there is scope for further efficiency gains both with regards to quality and output.

The ON rice market liberalization in a larger context

The development of a market channel in the Malian rice sector is comparable to that of several other agricultural vertical coordination systems in many developing and transition economies. Swinnen and Maertens (2006: 91) describe the supply chains of agricultural sectors in several developing and transition economies as having been fully integrated and state- controlled before the process of liberalization and globalization got under way in the 1980s and 90s. Central planning authorities or a para- statal organization often controlled the whole of the supply chain, from production to processing, marketing and retailing, and also provided inputs and credit to farmers. In fact, the only supplier of input and credit was the state- controlled VC, and it was also the only legal buyer of agricultural produce. Many of these systems were inefficient in providing incentives for increased production, and also in terms of credit recovery. (ibid. 2006: 92).

The liberalization of agricultural sectors in the 1980s and 90s led to a collapse of the vertical coordination systems previously managed by the state. Access to inputs such as fertilizers, seeds, and capital was severely restricted as state-owned companies and institutions disappeared from the market, and farmers lost their source of inputs and extension services. However, new private actors entered the market and eventually started to contract with farmers, providing inputs and credit in return for stable supplies. Thus, private vertical coordination has served to overcome market imperfections and increase economic efficiency of supply chains where institutions are lacking. In many countries (for example in SSA), rural financing is most commonly organized through private vertical coordination (Swinnen and Maertens 2007:8). The most common forms of support are credit, inputs, prompt payments, transportation and quality control (Swinnen and Maertens 2006: 93). However, in SSA, as well as in several other regions and countries, the government still takes part in the system, for example by owning shares in food processing companies and banks (ibid. 2006:95).

Current policy interventions

The GOM has three major responses to meeting the challenge of increasing demand and improving food security. These interventions consist of a national security stock, tax exemptions on rice imports, and subsidized fertilizer within the Rice Initiative program.

The national intervention or security stock consists of 100, 000 tons of cereals out of which 20, 000 tons are rice. The rice security stock largely consists of imported rice and food aid, although under the Rice Initiative scheme the nationally produced share of the stock has increased. The security stock is managed by the Office des Produits Agricoles du Mali (OPAM), which buys the produce from private actors (importers, wholesalers or POs) when prices are low, and releases it onto the market in times of scarcity by re-selling it to private actors. The security stocks have different effects on the market channel depending on the degree of domestically produced rice in the stock, when and to whom the rice is sold, and at what price.

In times of scarce supply on the market the GOM grants a temporary and complete exemption on customs tariffs (as opposed to 10% of value), and VAT (18% of value) (Direction Nationale des Douanes; 2010). This exemption is made during a few months of the year when the local supply

drops and prices rise, usually in the period before the current year's harvest when stocks run short. If this period coincides with Ramadan supply runs particularly short since consumption increases sharply during that month (DNCC 2009: 1)². USAID notes that import exemptions strongly discourage private vertical coordination, since they provide wholesalers with large quantities of cheap and homogenous rice without having to meddle with upstream actors of the market channel. In this way, exemptions have a clear effect on the functioning of the market channel and (in the long run) local production levels. In 2005, imported rice accounted for 45 % of the commercialized rice, and 50 % of the rice sold in Bamako was imported (Baris, Zaslavsky and Perrin 2005: 22).

IER (1994: 8) observes that consumption of imported rice increases substantially as prices for local and imported rice approach one another, and claims that imports during 1991 and 1992 substantially decreased demand for local rice at production centers, and also forced down producer prices for local rice. In supporting farmers' to sell their produce and be able to repay input credits, care must be taken regarding tax exemptions on imported rice.

The latest and most debated government intervention is the Rice Initiative, which is the focus of this thesis, and is analyzed in greater detail.

3.3) the Rice Initiative

In 2008 the Malian Government launched the Rice Initiative as a campaign in collaboration with Canada, the Netherlands and the African Development Bank (Ministère de l'Agriculture, 2009:4). The main objective of the campaign is to exploit Mali's comparative advantage and expand rice production so as to make Mali self-sufficient in rice and secure food security. It is also to make the country a net exporter of rice by 2012 (Ministère de l'Agriculture, 2009:5). According to the government, the potential to reach these goals lies in the country's large endowments of land, water from the Niger River, and human capital, as well as a demand

² As an example, in 2009 124 399 tons of exempted rice was imported between 1 March and 31 May, out of which 13 636 tons was delivered to the OPAM as a part of the national intervention stock. For 2008 the quantity exempted was 105 799 tons (DNCC 2009: 2), for 2007 5 504 tons, for 2006 nothing at all, and for 2005 201, 194 tons. About two thirds of imported rice has been imported with exemptions over the last few years (USAID 2009: 8).

potential from the surrounding countries and the preference of domestic consumers for local rice (Ministère de l'agriculture, 2009:5).

A production target of 1 000 000 tons of rice was set. The government of Mali did not only aim at covering the needs of domestic consumption (900 000 tons) but also at generating a reserve stock of 100 000 tons of cereals, of which 20 000 tons would consist of rice. Today, this rice stock is governed by the former agricultural marketing agency known as "Office des Produits Agricoles du Mali" (OPAM). The rice stock of OPAM mainly consists of imported rice and food aid provided by Japan. As a part of the new rice initiative, OPAM also strived to purchase 46 000 tons of Malian rice during spring of 2009 with the aim of releasing this rice into the market in order to lower the consumer prices (USAID, 2009:9).

In the ON, technical equipment in the form of five mini rice mills has been provided as part of the Rice Initiative, although not subsidized but on credit. Five producer organizations, one in each of the ON production zones, have each acquired a mini rice mill, and the credit is to be managed by the micro credit agency FCRMD situated in Niono. This credit was financed during the campaign of 2008- 2009 but not during 2009- 2010 (Plan d'Opération 2009-2010: 16).

However, the major instrument used to boost local rice production within the scope of the Rice Initiative is a heavy subsidy for mineral fertilizer. This subsidy constitutes the lion's share of the costs of the program. The reasons for this is the fact that input provision has been failing, and that fertilizer, as mentioned earlier, makes up the bulk of farmers' costs, and is also proven to be highly correlated with output quantities. Thus, the Rice Initiative can in part be looked upon as the government policy response to the inability of the liberalized, private market structure to coordinate such supply. Both base coat fertilizer and Urea (top coat fertilizer) are subsidized within the scope of the Rice Initiative in such a way that a 50-kilogram sack costs 12500 FCFA irrespective of the current market price.

Another important instrument was making micro finance institutes provide all producers with fertilizer credit. This included the ones dropped earlier by institutes as a result of failure to repay their credits (so called ineligible farmers).

4. Evaluating efficiency of the market channel

The efficiency (competitiveness) of the market channel is investigated below by analyzing in turn the market channel structure; coordination, competition and concentration; process indicators and outcome indicators.

4.1) Structure of the market channel

The ON market channel for rice is at present complex and made up of a large number of actors who are sometimes involved in several stages in the channel at the same time. It is impossible to assess the number of actors in the market channel, nor the exact relationships between them; they are simply too many (Interview DNCC 30.7.2010). Bonneval et al (2002: 138) identify three distinct market channels or segments for rice to flow from producer to consumer, while USAID (2009: 15-16) suggests there are at least six different channels. The discrepancy in these findings is consistent with the general lack of knowledge among interviewees on the exact structure of the market channel. According to USAID (2009: 14-15), which has performed the latest study of the ON sub- sector, the major stages in the market channel are the following;

- **Input supply and financial services** are usually provided to farmers through producer organizations, in the form of Village Associations or cooperatives. These are in turn organized into “second level groups” supported by different donor organizations. VAs seek production credit through banks and credit institutes on behalf of their members, and reimburse the bank after harvest at an interest of about 11- 13 % (Interview CIR 30.6.2010; FCRMD 12.7.2010; CVECA 14.7.2010). Purchase of inputs is through tenders (Interview FCRMD 12.7.2010). Farmers and producer organizations who have not been able to repay their production credits to the banks purchase their inputs up front, or turn to another actor in the market channel for credit (i.e. engage in private vertical coordination). This actor could be a wealthier farmer, a family member, a trader etc (Interview FCRMD 12.7.2010), and in this case reimbursement will be in kind in the form of paddy and a much higher interest rate.
- **Production.** Most farmers in the ON are smallholders who lease, on an annual basis, a few hectares of land and the right to use water and irrigation services from the Office du Niger

(Diarra et al 1999:5). Most of them are, as mentioned above, organized into some sort of producer organization, of which there are many different types. There are also larger commercial farms, ranging in size from 5 to more than 100 hectares, which have a longer leasing period. These farms are generally large enough to own their own mills.

- **Assembling.** Private collectors or wholesalers' agents purchase rice either directly from farms, or from local markets, and bring it to major market centers. Collectors sell their rice to either wholesalers, semi- wholesalers or directly to retailers (interview semi- wholesaler 1, 15.7.2010)
- **Processing.** Processing can be performed either in private mini rice mills, within farmer organizations (generally Village Associations or cooperatives), or in the case of larger farms, at the farm level. One of the largest wholesalers also mills rice on a small scale.
- **Wholesaling.** Usually wholesalers are also importers, as well as traders in other cereals such as wheat.
- **Semi- wholesaling.** Semi- wholesalers purchase rice from the major wholesalers, as well as from collectors who bring the milled rice to market centers.
- **Retailing.** Retailers get their supplies either from semi- wholesalers or from traveling collectors.

None of the interviewees seem to fully grasp the flow of rice from producer to consumer. For example, Adama Koné at Direction Nationale du Commerce et de la Concurrence claims that at least five to six intermediaries intervene between the producer and consumer stage of the market channel. These are in order primary collectors, who collect small amounts of rice (from a couple of kilograms to a couple of 50 kg sacks); secondary collectors/ semi- wholesalers; tertiary collectors/ transporters; wholesalers; semi- wholesalers; and retailers. The length of the chain and the high number of actors involved in it are considered reasons for high consumer prices. The second market channel passes through OPAM, which buys security stocks through public tenders either from producer organizations or from traders. DNCC does not have a clear apprehension of

the exact flows from producer to consumer, but claims that it is difficult to tell exactly what happens in between, and how many actors intervene. On the other hand, the market channel for imported rice is shorter; importers/ wholesalers; semi- wholesalers and retailers. At times when rice prices peak, the government will grant tax exemptions on rice imports. On these occasions actors who do not usually deal with rice will engage in importing rice and the market channel for imported rice will become longer for some time (Interview DNCC 30.7.2010).

4.2) Coordination, concentration and competition in the ON market channel

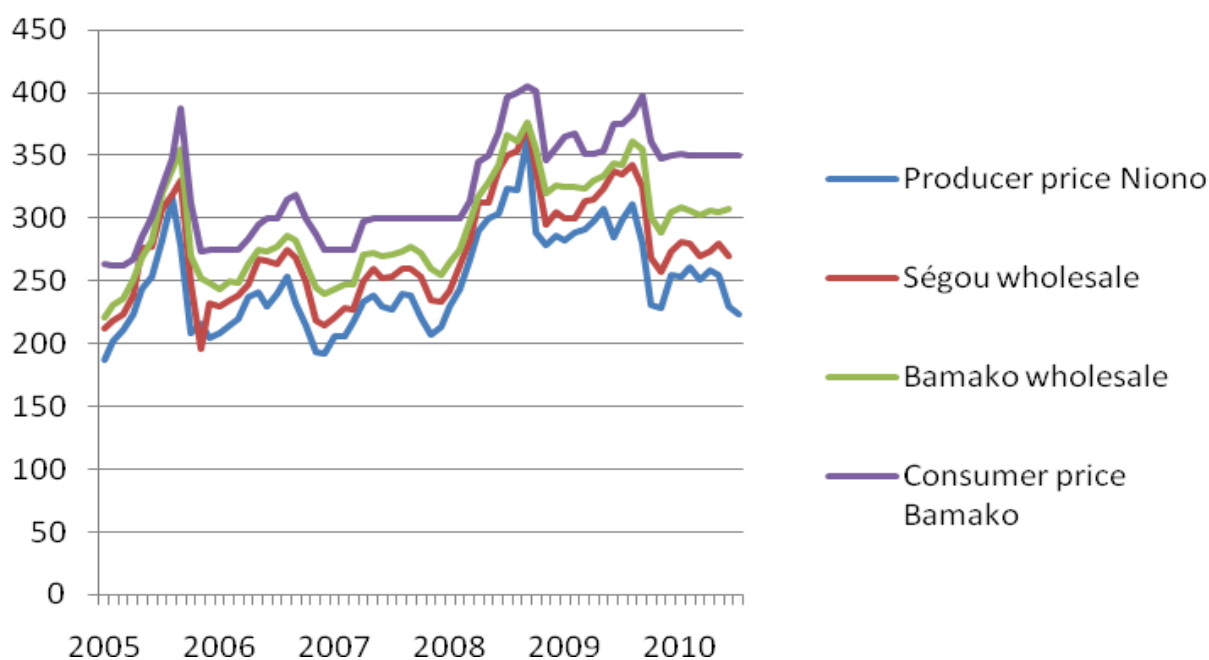
Dembélé and Staatz (1999: 19) note that the creation of a well- functioning system for provision of production credit became a huge challenge after liberalization. Private vertical coordination between the newly established VAs and traders failed since contracts could not be enforced. VAs would sell paddy on credit to traders, who would later fail to reimburse them, which meant VAs in turn failed to repay their production credit to the banks. Thus, there is a problem of input provision stemming mainly from insufficient coordination between actors in the channel.

The present market channel is a highly competitive system with weak coordination, low concentration and many alternative channels for rice to flow from producer to consumer. Overall, coordination between actors is lacking, due largely to the sheer number of actors in the market (Diarra et al 1999: 16). Since actors at all levels of the channel have multiple choices of buyers, there is a poor incentive structure for entering binding contracts (USAID 2009:22). Coordination takes place mainly through the price mechanism; market prices depend solely on supply and demand (IER; 2009: 65, interviews with semi- wholesalers 1 15.7.2010 and 2 15.7.2010, Christian Corniaux at CIRAD 22.6.2010).

There seem to be no entry barriers, and the number of actors in all stages of the chain is significant. There is a fairly efficient price transmission, where increases and decreases in production costs are immediately reflected in consumer prices. This implies a general lack of market power among all actors in the market channel (Bonneval et al 2002: 139). However, the length of the channel may imply that consumer prices may still be higher than necessary (Interview DNCC 30.7.2010).

Hence, the ON rice market channel is a market-based, competitive sector following the introduction of Chinese rice mills. Consistent with the findings of Poulton et al (2009) regarding this type of sector, we find an insufficient provision of production credit, inputs and extension services in the Office du Niger.

Figure 5: Price trend for local rice Gambiaka January 2005- July 2010. Prices in FCFA/ kg



Source: Observatoire du Marché Agricole

Note in the trend above that the largest marginal is found in the retailer stage in the market chain. The reason for this, according to Mr. Adama Koné at DNCC, is large transport costs within Bamako, and not an expression of market power.

While concentration is low in the domestic market channel, the market for imported rice is heavily concentrated to three or four large importers (Interview DNCC 30.7.2010, USAID 2009: 14, and Baris, Zaslavsky, Perrin 2005: 30). Some interviewees claim substantial market power and large margins among these wholesalers who are able to keep cereal in stock, especially those who also import rice (Interview CIR 30.6.2010). Interviewees claim that some of these will buy

large quantities of local rice and stock it, so as to create a shortfall in the market. When the shortfall occurs, the government will grant import tax exemptions in order to keep prices low. The actors can now very cheaply supply themselves from the international market. The result is a decrease in competitiveness of local rice which becomes artificially more expensive than imported rice.

Their decisions on keeping this rice in stock or releasing it onto the market will have effects on prices for domestically produced rice, which of course means that they exert some kind of market power with regards to the domestic market channel although they do not trade with domestically produced rice. Without heavy import exemptions these actors would have a stronger incentive to invest in the domestic market channel. Consistent with these findings, the wholesaler/ importer Groupe Ami claims that the reason for large wholesalers/ importers not to provide themselves from the local market is inconsistent and insufficient supplies, and that the increased production following the Rice Initiative has allowed them to do so. Trading more extensively with local rice would require vertical coordination if traders are to ensure themselves of obtaining sufficient quality and quantity, through investing in equipment and providing entering contracts with farmer organizations or other traders.

Producers and producer organizations do not have the facilities or financial capacity to stock their produce in this way and wait for prices to increase. The lack of information on how the market functions as well as lack of financing implies that market power of farmers is generally low.

According to the reviewed literature, what we would instead like to find in the Office du Niger is a concentrated, market based system with public regulatory structures to maintain it, providing incentives for improved coordination. It should be noticed, however, that this research has been performed on cotton markets, and in a context that differs somewhat from the one we are studying. Whether this research is directly applicable to the case of the rice market of the ON is difficult to say; one important difference is the fact that cotton is produced for export purposes, while rice production in the Office du Niger plays an important role for ensuring food security for the farmers themselves and the local community. This should have implications for the optimal

level of concentration and market power. Nevertheless, an improved coordination will be difficult to achieve without increased concentration in the market.

4.3) Evaluation of process indicators

Input provision, credit and credit recovery

In the ON, farmers buy the fertilizers in cash or on credit. Production credit for seeds, fertilizer and some technical equipment is mainly provided through financial institutions; two banks (the BNDA and BIM), and micro credit institutions. The largest of these institutions are FCRMD, Kafo Jignew, and CVECA. The ON plays an important role in coordinating this system through supervising bidding among fertilizer suppliers and approving budgets for farmer organizations (USAID 2009: 10).

Both individual farmers and POs are able to seek production credit through the micro finance structures, although the prospects for receiving production credit are much better for producer organizations given their size. Producer organizations seek credit for the upcoming season from financial institutions, then buy fertilizer from fertilizer suppliers and distribute it to their members. At the time of harvest, the PO collects paddy from its members, processes it, sells it and pays back the input credit (USAID 2009: 10).

POs and individual farmers who have failed to repay their loans are listed as ineligible for bank credit during the subsequent season. It is estimated that about a third of the producers in the ON are ineligible and as such do not receive any credit through the formal financial structures (banks or micro finance institutes). In the case where a PO has become ineligible, it is often broken up, and the individual producers will have to try to seek other, informal ways of obtaining fertilizer. These farmers will normally not be able to use the recommended amount of fertilizer on their fields, and thus will not attain the same yields as other farmers. In interviews, this is highlighted as a major constraint on the production levels that are theoretically attainable.

There are a few ways for ineligible producers to seek production credit outside the formal structures. Farmers who possess the means pay their inputs up front. Some of the POs with solid

relations with a micro finance institute can seek more credit than they need, and pass on some of it to an ineligible PO. Another way is to borrow money from relatives. In both these cases, it seems reimbursement can be made with or without interest; in cash or in kind (Interview FCRMD 12.7.2010).

The last approach is to enter into an agreement with a trader or a wealthier farmer, who provides the input credit. In this case, reimbursement is made in paddy. A common scenario is that the lender at the time of harvest comes to collect the paddy directly at the field. Sometimes the deal includes the condition that the harvesting has to be performed by the money lender for a fee, which is also collected in paddy. This paddy collected is then sold on by the money lender, sometimes as paddy and sometimes milled. Interviewees are unanimous in the view that this type of relationship is highly undesirable. The reason is that it makes the farmer vulnerable and powerless. All interviewees who have received the question stress the difference in conditions between formal bank credit and credit provision through private actors, and in the latter case it is argued that farmers fall deeper and deeper into debt having to pay extortionate interests on the credit given. The interest rate of micro finance institutions usually lies between 11- 13 %, while it is not unusual for the real interest rate of private actors to be 50% (Interview FCRMD 12.7.2010). Another downside of the deal, from the point of view of the farmer, is that if he had the possibility to mill the rice himself, he would both be able to sell the rice at a higher price, and to use the bi- products as fodder for his livestock.

Access to input credits and credit recovery has been difficult in the liberalized market channel (Dembélé and Staatz 1999: 19, Interview Faranfasi So 14.7.2010). Mariko, Kelly, and Chohin-Kuper (2000: 4) write that the debts of many farmer organizations and thus the difficulty in acquiring inputs threatens competitiveness of local versus imported produce. Thus it seems that improved vertical coordination is needed in order to ensure an efficient provision of inputs and improved reimbursement rates.

Quality

Quality can be assessed by several features; cleanliness and whiteness of the grain, degree of broken rice, and degree of foreign objects in the rice, such as pebbles Also, domestically

produced rice is highly appreciated for its taste (IER 2008:59). USAID (2009: 17) distinguishes two segments for rice on the Malian market, a high end segment and a mass market segment. Although there are many varieties, three main ones are of particular interest.

Gambiaka is a high quality domestically produced homogenous rice highly appreciated by domestic consumers, but far too expensive for most families. There are at least two quality levels of this high- end rice. The mass market segment contains imported, low quality rice with a lot of broken grains (although originating from different countries, the generic term is RM40); and a heterogeneous, un- cleaned local variety which is the produce of the small Chinese rice mills introduced after liberalization (called DP from *Décortiqueuses Privées*). Most of the imported rice is low quality; thus imported rice primarily competes with lower priced domestic rice (USAID 2009: 11). The local variety is less homogenous than the imported one, often containing impurities, pebbles and a mix of varieties and broken and whole grains, but has a better taste (Interview semi- wholesaler 1 15.7.2010, 2, 15.7.2010 and Groupe Ami 29.7.2010). It often requires sorting and cleaning before consumption. The imported rice sold on the market in Bamako has been stored for several years, which makes it dry out and lose its texture and taste. On the other hand, the dryness of the grains makes them swell during preparation, which is appreciated by large families with many mouths to feed.

Quality is dependent upon many factors in production, post- harvest handling and processing. If the ears are left un- harvested for too long, the grains will lose their humidity and break easily when milled, irrespective of the milling technique used. It is also difficult to assess the quality of paddy from the look of it, without knowledge of cultivation conditions (Interview CIR 30.6.2010). This implies that in order to maintain a certain level of quality, it is necessary to establish some form of coordination between producer and processor, so that production can be properly supervised. Baris, Zaslavsky and Perrin (2005: 28) describe quality of rice as dependent on many factors in the post- harvest handling. Since the bulk of farmers do not have access to proper storage facilities, a lot of the rice produced is left lying on the ground by the field, which makes the rice unclean. In addition, if the ground is wet, the grains will turn black (Interview Groupe Ami 29.7.2010).

As for processing, the type of machinery used to mill the rice has a large effect on quality levels. The output from the small portable Chinese rice mills has a large percentage of broken grains, is heterogeneous (not standardized), and often contains impurities and foreign objects. This rice needs cleaning and sorting before preparation. Thus liberalization and the shift to Chinese rice mills worsened the quality of the bulk of ON rice. In recent years a new type of de-huller, which gives a product of significantly higher quality, has been introduced. These “*mini rice mills*” or “*minirizeries*” in French, produce rice with less broken grains and provide the possibility of choosing quality and mixes of broken and whole grains; a quality fully comparable to that of the old large rice mills (interview Fafré Diarra, ON 6.7.2010). The new mini rice mills are much more expensive not only in procurement but also in operating costs; the cost of de-hulling with a mini rice mill is 6- 10 CFA per kilogram of paddy compared to 6-7 CFA per kilogram with the portable rice mills. FCRMD claims in interview (12.7.2010) that the mini rice mills often break and that spare parts are expensive to acquire. They also require large quantities of paddy to stay profitable. The high cost of a mini rice mill implies that only POs are able to acquire such a machine. Thus, a mini rice mill requires both vertical and horizontal coordination in order to keep it producing under full capacity.

All in all, it seems that, in order to improve quality, better coordination is needed to ensure proper handling of the produce in production, stocking and processing (Baris, Zaslavsky and Perrin 2005: 28).

Extension services

At the time of privatization of the Malian rice market, extension services provided by the state were brought down to a minimum. The services presently provided by the ON concern production only, not marketing of the product. A number of private organizations are providing farmers with extension services, and some of them are POs. Rice traders do not provide extension services, meaning private market coordination does not exist in this field between traders and farmers (Interview Faranfasi So 14.7.2010).

Extension services through private organizations are provided to farmers at a fee but are subsidized; one of the largest providers, Faranfasi So, receives financing from AFD in order to cover some of the costs. Faranfasi So and other providers like it mainly partner producer

organizations, which implies that farmers who are not part of a PO cannot take advantage of the services. The ON support is provided to all types of farmers; however, the ON does not possess the resources to cover even a fraction of farmers in need of these services, and as a result extension services are lacking in the Office du Niger. For example, recruitment of advisors is slow, and follow-up of outcomes is lacking (interview CIR 30.6.2010). Private actor coverage is also insufficient.

As a result of insufficient provision of extension services, many farmers do not possess knowledge of what fertilizer to use, how to use them, when to harvest and how to store their harvest. The lack of extension services is a major obstacle to both increased quality and increased output, and would need improved coordination between the producer and processor stages of the market channel in order for processors to obtain sufficient quality and quantities of rice. Improved extension services could also be provided by the government if significant funds were located to this end. Still, the feasibility of such a solution could be questioned due to budgetary constraints.

All in all, it seems that in order to improve the performance of the process indicators, improved vertical coordination is needed. The next section explores the performance of the final outcome indicators, i.e. the overall efficiency of the market channel, which is dependent on the performance of the process indicators.

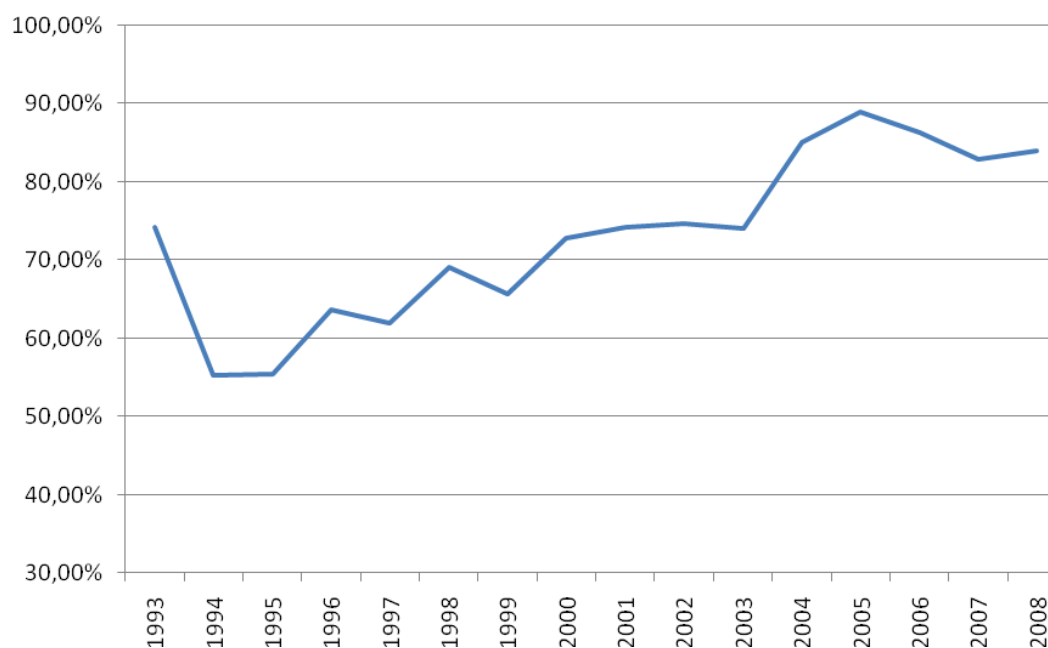
4.4) Evaluation of outcome indicators

Returns to farmers

High returns to farmers are vital for providing incentives for more efficient production. Most farmers in the ON are smallholders who cultivate for family needs and sell whatever surplus they get, which means that production for commercial purposes is scarce. Two thirds of all units in the ON are smaller than 3 hectares and on the decrease as family sizes increase. This implies that surpluses are insufficient to be commercialized (Barry, Zaslavsky and Perrin 2005: 29). Without a sufficiently high producer price, farmers will not have incentives to increase production much beyond family needs. Fousseini Diakité of the Regional Chamber of Agriculture in Ségou points

out that these subsistence farmers, in order to put more rice on the market, need capital for investments. He proposes a subsidy to this end.

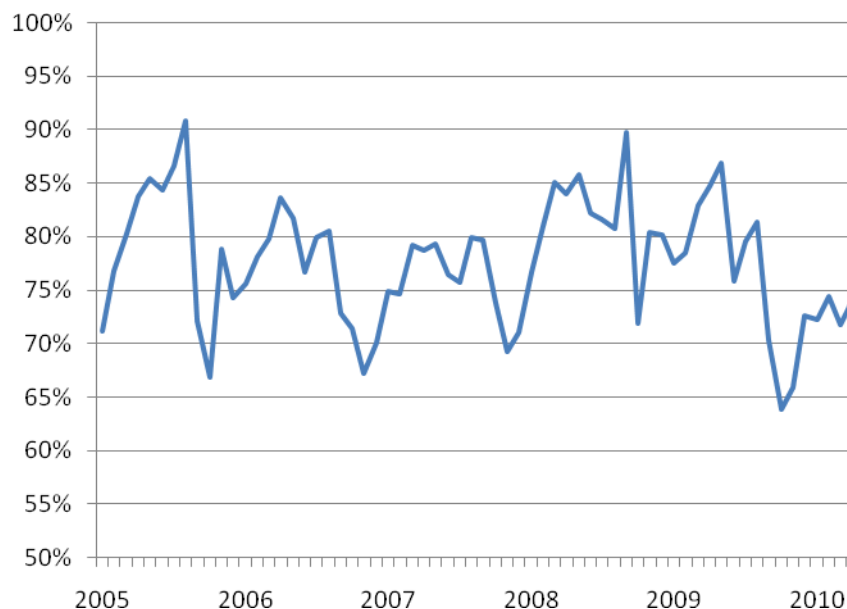
Diagram no. 6: Development of producer share of consumer prices 1993- 2008 (whole of Mali)



Source : IER, Ministère de l'Agriculture.

Since liberalization, Malian rice producers have continuously received a larger share of the final consumer price. Liberalization brought about a substantial increase in producer share of consumer prices, while the margins of other channel stakeholders diminished (Barry, Zaslavsky and Perrin 1999: 29).

Figure 7: Producer share of consumer prices 2005- 2010 in Niono, Office du Niger.



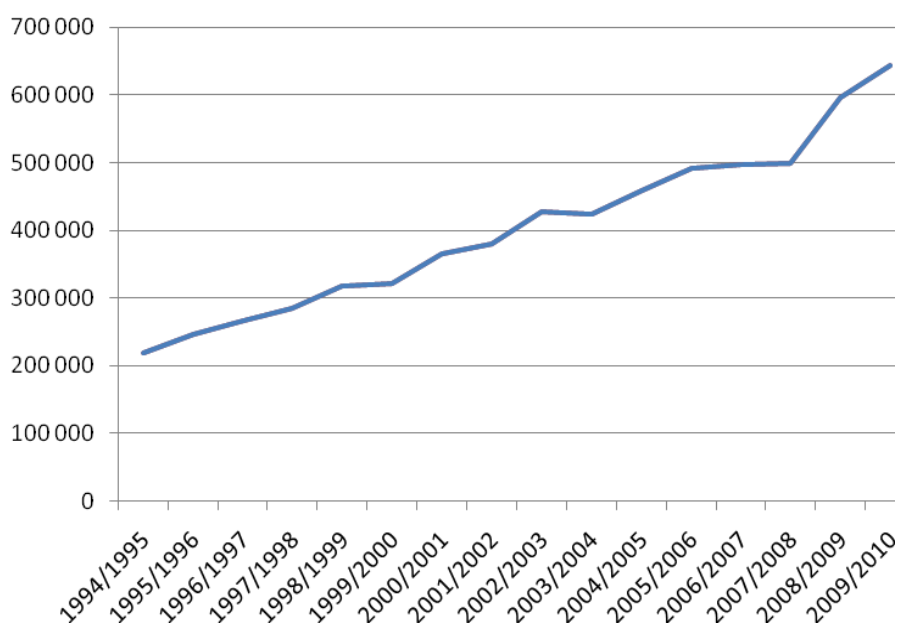
Source : Observatoire du Marché Agricole

However, in 2009 producer share of consumer price decreased in the Office du Niger, and the reason given in interviews is the substantial increase in supply following the Rice Initiative in combination with large quantities of imported rice. The downward pressure on price has mainly hit producers but seems not to have benefitted consumers in Bamako at all. In fact, farmers faced severe difficulty in selling their produce during 2010, which meant difficulty repaying the input credit received as part of the Rice Initiative scheme, while the massive supply has not managed to bring down consumer prices (Interview Chambre d'Agriculture 8.7.2010, semi- wholesaler 1 15.7.2010, and 2, 15.7.2010). This, according to Fosseini Diakité at the Regional Chamber of Agriculture in Ségou, reflects market power of importers/ traders able to stock the rice in order to keep prices high through restricting the quantity brought to market. This view is also brought up by CIR in interview (30.6.2010). The inability of the GOM to gain knowledge about the true quantities available in stock makes it difficult to regulate the market in this way without hurting local producers or creating a shortfall.

The producer share of consumer price will be higher for higher quality rice. Semi- wholesalers 1 and 2 claim that they experience a worse bargaining position for the higher qualities of Gambiaka than for the low- end DP variety. Improving quality is therefore interesting from a producer perspective and should provide incentives for increases in production.

Yields and self- sufficiency

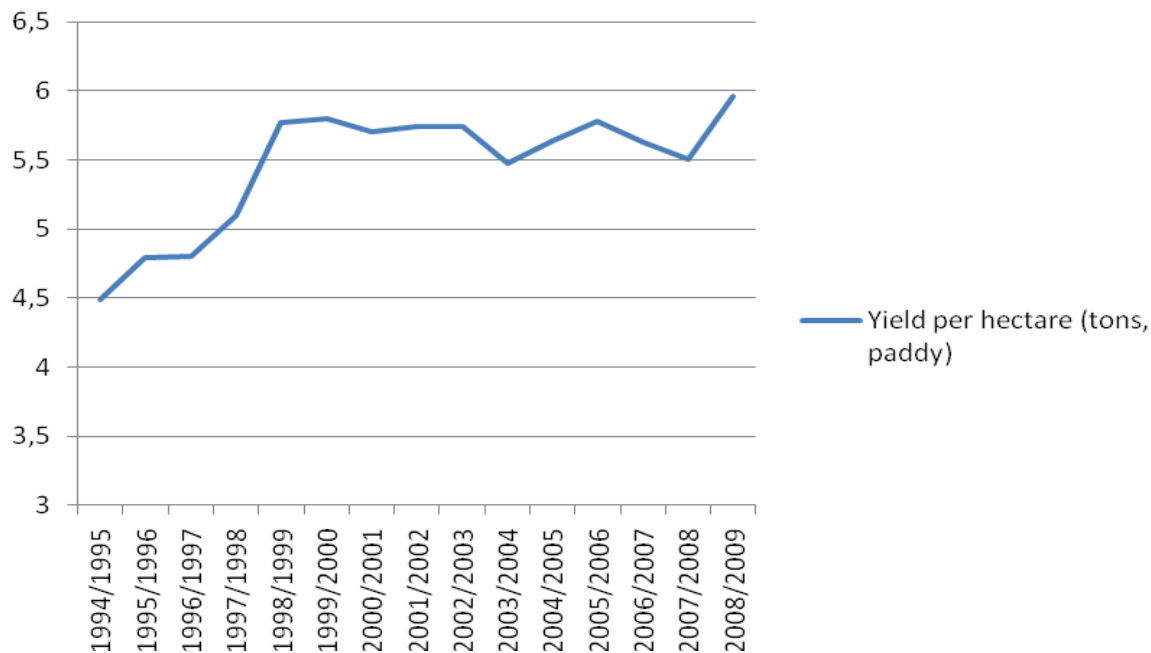
Figure 8: Development of total yields in the ON.



Sources: ON 94/95-08/09, and DNA 09/10

In the Office du Niger, much of the increases in yield in recent years is explained by increases in the area cultivated, not in per hectare yield increases. There is still large scope for further enlargement of production areas within the ON , which theoretically has a potential of 1 million ha, in comparison to today's ca. 80 000 ha. There has been a fairly steady increase in yields over time, with a sharp increase following the introduction of the RI and the 2007 price hike. It is clear that both the price hike and the RI have had a positive effect on production levels. The RI has also contributed to providing incentives for expanding production areals because of lower production costs.

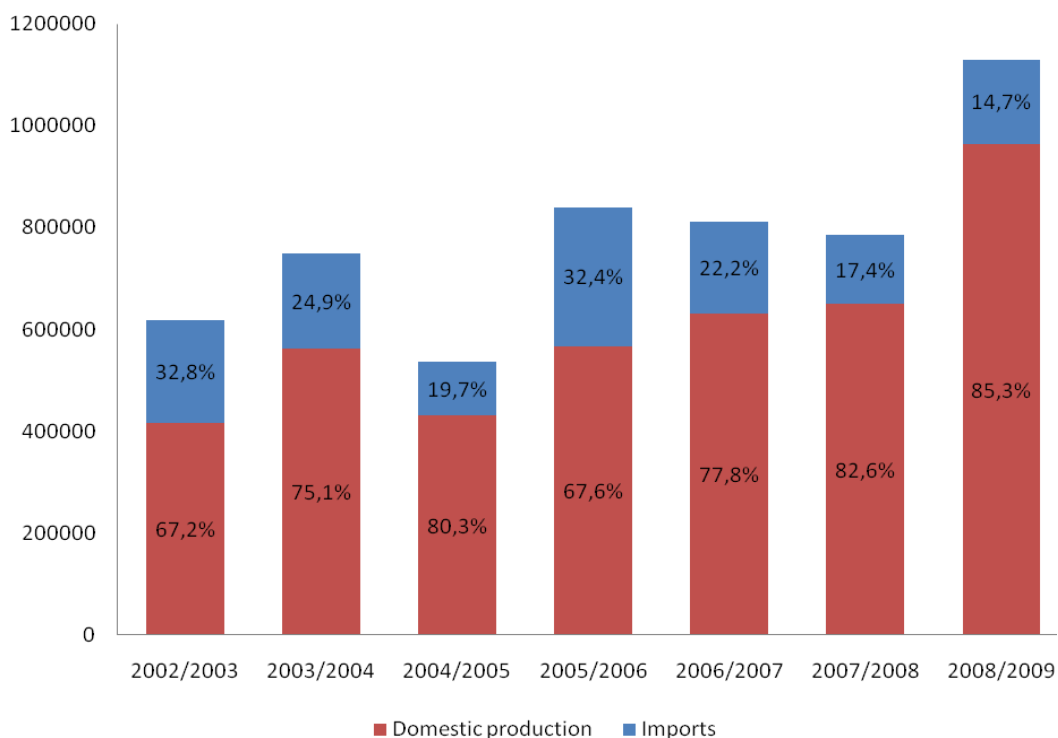
Figure 9: Development of yield per hectare 1994/95- 2008/09



Source: Office du Niger administration 2009

The trend shows stagnation in growth in yield per hectare over many years, and then a drastic increase with the introduction of fertilizer subsidies under the Rice Initiative scheme in 2008 as seen in the graph above. Per hectare yield is very closely correlated with efficient use of fertilizer, and this is the *raison d'être* for the Rice Initiative. There is still scope for further increases in per hectare yields with improved utilization of fertilizer and improved irrigation. Improving access to and knowledge of how to use fertilizer efficiently will require either improved coordination or continued subsidization.

Figure 10: National self sufficiency. Self sufficiency is estimated by calculating domestic production's share of total consumption (staples). Quantities on the Y- axis in tonnes.



Source: USAID 2009:2.

There is an improvement in self sufficiency ratio between 2007/2008 and 2008/2009, but it is partly outweighed by the large increase in the total amount of rice consumed. In order to maintain, and to make further improvements in the self sufficiency ratio, production levels must be sustained and augmented.

It should be mentioned that, given the extremely high population growth rate and the shift in dietary habits in favor of rice, self- sufficiency will be difficult to reach however much production is increased. This is stressed by Christian Corniaux at CIRAD, and also illustrated by the graph above.

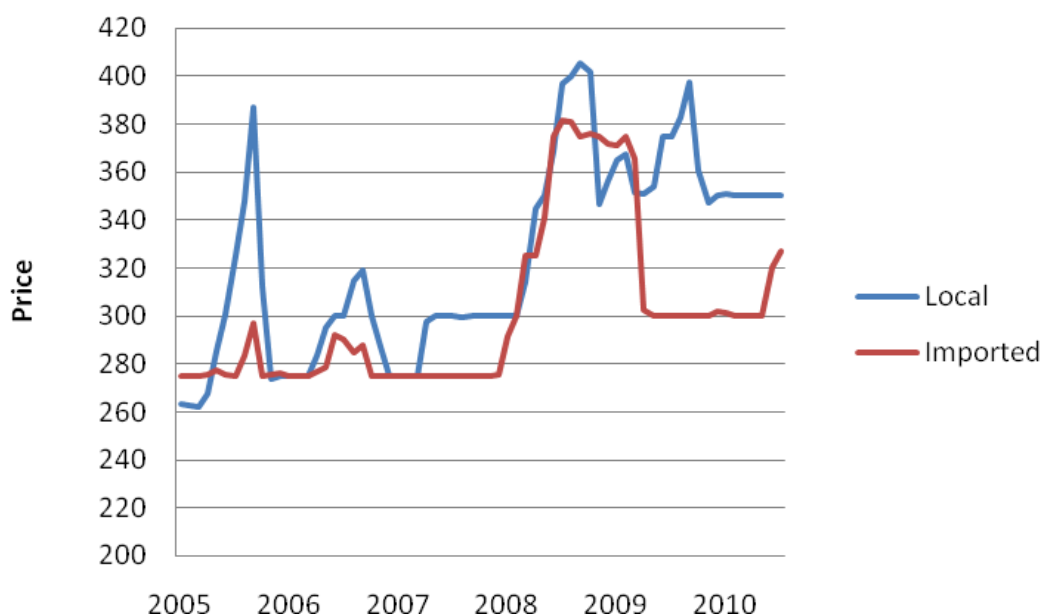
Competitiveness in relation to imported rice

The purchasing power of the Malian consumer is generally very low. Therefore, most consumers will choose the variety of rice which is at present the cheapest, regardless of quality (Interview DNCC 30.7.2010 and Groupe Ami 29.7.2010). Baris, Zaslavsky and Perrin (2005: 28) note that

an improvement in quality of local rice will not make it more competitive on the domestic market if it involves a corresponding price increase, given the low purchasing power of Malian consumers. Neither is it enough for local rice to sell at the same price per kilogram as the imported variety since local rice does not swell as much during preparation; IER (1994: 8) finds that 100 kilograms of imported rice equals 150 kilograms of local rice when prepared. However, at comparable quality levels and prices, consumers have a clear preference for local produce, because of its superior taste and texture (USAID 2009; 11, Interview Groupe Ami 29.10.2010). Malian rice also sells well in neighboring countries with higher purchasing power such as Côte d'Ivoire and Burkina Faso for the same reasons.

Hence, when speaking of competitiveness of local rice in relation to imported rice on the *local* market; high quality should not be prioritized, but consumer price. That is, improved quality will have no effect as far as food security is concerned, but may lead to higher revenue for farmers. Focus on quality becomes interesting in a hypothetical export context (Interview CIR 30.6.2010), as well as for a rather small high- end segment of consumers. However, Dembele and Staatz (1999:19) note that exporting high- quality rice to neighboring countries like Burkina Faso and Côte d'Ivoire brings about the opportunity of using the export income to import low- cost Asian rice. The result would be increased food security.

Figure 11: Consumer prices in FCFA/ kg for local and imported rice Jan 2005- July 2010.



Source: Observatoire du Marché Agricole

Consumer prices for local rice stay well above the price of imported produce, even after the production increase following the 2008 Rice Initiative. One reason for this is the difference in quality. Imported rice is much older and of inferior taste to local rice and is the cheapest rice available in the world market. Another reason for the price difference is the heavy import tax exemptions provided by the GOM, which give importers/ wholesalers access to large quantities of extremely cheap produce. The mark-ups for importers/ wholesalers on this rice are larger than the ones on domestic rice in spite of the difference in consumer price. Also, the cheapest rice will always sell best given the low purchasing power of Malian consumers. Local rice, as earlier mentioned, also contains impurities and needs to be washed and sorted before cooking. Thus, in terms of competitiveness, there are improvements to be made in terms of both quality and price. Increased production gives scope for reaching both of these objectives. Care must also be taken with regards to exemptions on import taxes in order to protect local rice production.

5) Effect of RI on the efficiency of market channel

5.1) Effect on concentration and correlation

The Rice Initiative can in part be looked upon as a government policy response to the inability of the liberalized, private market structure to coordinate provision of inputs and extension services, and to recover production credit. The government has regained some of its coordinative functions it had during the state monopoly. Subsidized fertilizer allows at least a portion of ineligible farmers to gain access to credits, or to be able to pay their fertilizer up front, without entering an agreement with a private actor such as a wealthier farmer, a trader or a seller of fertilizer (Interviews with CIR 30.6.2010, CVECA 14.7.2010, FCRMD 12.7.2010, and Fafré Diarra, ON 6.7.2010). This means that the Rice Initiative could contribute to a decrease in private vertical coordination in the stage between producer and trader, and decreased market power of private input suppliers to some extent. It is, however, impossible to what extent this has taken place, since no study has been carried out on the topic.

On the other hand, the substantial increase in production and the resulting price decrease has allowed Groupe Ami, one of the large wholesalers/ importers, to finally employ one of the old, large rice mills, previously owned by the ON, full time, which is the only way to make it profitable. This mill has not been running for the last 20 years. Mr. Sounkalo Keita at Groupe Ami claims that the production growth following the Rice Initiative is quite substantial, allowing the company to take an interest in locally produced rice. In order to be able to collect the proper quantity and quality needed to run the mill, Groupe Ami contracts with the cooperative Faranfasi So, as well as a private trader, who in turn is one of the private providers of credit in the ON and able to deliver large quantities. This implies that the Rice Initiative has allowed for increased coordination in the processor/ wholesaling stage. It could also encourage increased concentration in the producer stage in the form of cooperatives.

An alternative option to subsidization of inputs (where the government in fact takes on a coordinative function in the sense that it allocates resources to farmers) would be to implement regulatory structures. A license system would serve as an entry barrier for new entrants in order

to create a more concentrated system, where it would be in the private actors' best interest to provide inputs and extension services as a way of ensuring sufficient quality and quantity. According to the reviewed economic literature, this would, at the expense of higher market concentration and an increase in market power for some of the actors, lead to the ability of the market channel to independently coordinate actions so that subsidies would not be needed.

However, the Rice Initiative seems to have succeeded in strongly improving input supply (at least in the short run) without restricting competition. Although many factors affect production, it is clear that the Rice Initiative has strongly contributed to increasing output in the ON. The vulnerability of the system lies in the fact that the subsidies must be continued in order for coordination to continue to work properly. The Rice Initiative is a very costly program. It has created a momentum in which private vertical coordination becomes more attractive among some channel members. If production levels cannot be maintained, this momentum will be lost. It is therefore important to encourage coordination while it is still there.

5.2) Effect on process and outcome indicators

As mentioned, the main intervention within the scope of the RI was to provide all farmers with fertilizer credit during the first year of the program, including the ineligible farmers. However, sufficient supply of base coat fertilizer was not provided that year, which meant many of these farmers were only provided with top coat fertilizer. Many were unable to repay their production credit at the end of the campaign, which meant that credit recovery declined that year (Interview FCRMD 12.7.2010). As a result, for the next season, credit suppliers were allowed to choose their clients, which meant that producers who could not repay their production credit did not receive credit for the next season (Plan d'op 2009- 2010: 13-14; interviews CVECA 14.7.2010 and FCRMD 12.7.2010). Producers who are not eligible for credit, but who possess their own means can still purchase fertilizer up front at the subsidized price. According to the Ministry of Agriculture, the subsidies have implied that 52% of the farmers, who earlier had no access to fertilizer, now do. How this number is arrived at, and why the ON administration does not have the same information, is hard to tell.

According to the evaluation carried out by the Ministry of Agriculture itself, increased producer revenues induced by the RI have allowed the offices to free themselves of debt, resulting in a credit recovery of “98, if not 100%” (Bilan IR 2008- 2009: 31). This claim is contested by FCRMD, who in interview (12.7.2010) claim that in their case about 136 million out of the 600 million FCFA given in credit during 2008-2009 were yet to be repaid. This implies a repayment rate of 77. 5%, and is a significant deterioration from the repayment rate of FCRMDs’ credit receivers of 97- 98% during normal years. In June 2010 the total rate was 90% (Bureau du Vérificateur Général 2010: 47), a deterioration of 7-8 percentage points. The main reason for this is according to FCRMD the fact that the micro finance institutes were forced to finance the ineligible farmers during the first season, i.e. farmers with a higher risk of failure of repayment. Another reason is a delay in the supply of fertilizer during the first season (2008/2009). Only eligible farmers were given the proper amount of fertilizer, which meant maximal output levels could not be reached for ineligible farmers and they thus struggled with repayment (BVG 2010: 48, Interview FCRMD 12.7.2010).

The large increase in production following the RI has also led to a problem of storage and conditioning of paddy. In many cases, farmers have had no alternative but to store the rice in the field unprotected from rain etc. Mr. Keita with Groupe Ami claims that this has made the grains blacken, although the taste has not changed. To improve quality, proper storage facilities, as well as efficient mechanisms for providing extension services and advice to farmers need to be put in place. The RI has not had any effect on provision of extension services (Interview CIR 30.6.2010). However, the increase in output following the Rice Initiative has contributed to allowing larger actors in the market channel to explore new market segments and increase the quality of domestic rice. This is because large rice mills and mini rice mills (which give higher quality rice) require larger amounts of rice to stay lucrative. There is no doubt that the subsidy has implied a significant increase in production. This is true for total production levels as well as for yields per hectare. These are the results of an augmented production areal as well as improved use of fertilizer induced by the RI. In the Ségou region, the RI has induced a 19.53% increase in the use of fertilizer and a 15.82% augmentation of the area cultivated (BVG 2010: 48). Increases in cultivated area may imply improved possibility for commercialization of the produce.

In spite of the massive increase in production, rice imported with import exemptions increased by 175.6% in 2008 and 67.9% in 2009 (BVG 2010: 50). This reflects on the one hand the lack of a holistic approach to the value chain on the part of the government, and on the other an important increase in demand. There has been a massive increase in per hectare yield following the launch of the RI in 2008. The production increase has in fact been so large that The Malian market has not been able to soak up the massive quantity produced. Groupe Ami 30.6.2010, Regional Chamber of Agriculture in Ségou 8.7.2010, CIR 30.6.2010 claim in interviews the reason for this is the high levels of imports made possible through import tax exemptions granted by the government. This means producers have not been able to sell their produce and hence struggled to repay their fertilizer credits. A large number of farmers will thus become indebted and ineligible for production credit come next season, which hampers production growth. Similarly, CIR says that the market power of some actors in the market (notably the “grands commercants” mentioned earlier) creates a situation where the government will allow too large quantities to be imported, and that this has created problems for the implementation of the Rice Initiative in terms of farmers’ ability to sell their produce and stay eligible for production credit during coming seasons. It now seems that the increase in demand to a disproportional extent has been met by imports, leaving producers unable to sell their rice.

In order to sustain high production levels over time Mr Amadou Waigalo at Faranfasi So claims that attention must be directed to the totality of the market channel. Efforts at the producer stage are not enough. Without the support of proper marketing strategies, extension services and storage facilities production levels may not be maintained in the long run. The ON does not have the capacity or resources to sufficiently provide farmers with production credits and extension services, even with the subsidy.

6 Conclusions

The fierce competition in the ON market channel has historically brought about increases in producer prices and productivity gains, but also an insufficient supply of inputs and extension services which are vital for long term production optimization. Improved vertical coordination would come at a cost of increased market concentration and decreased competition. However, efficiency gains should be large enough to outweigh these effects in terms of efficiency regarding quantity and quality.

The Rice Initiative has created a momentum where the massive production increase has made private vertical coordination possible and attractive for some channel participants. The subsidy scheme, however, does deter producers from entering into contracts with traders with the aim of gaining access to fertilizer credit. It is quite possible that the productivity gains will be lost in subsequent years due to farmers' inability to repay their production credits. Subsidies would also need to be granted for the purpose of improving extension services. It will therefore be difficult to sustain present production levels without continuous subsidization within the scope of the Rice Initiative. Given that the Rice Initiative is already a very costly program, the encouraging of private vertical coordination could be considered as an alternative or complement to subsidization. This may also help turn importers' eyes away from the international market and towards the domestic market, avoiding the problem of non-payment of production credits and unsold paddy.

Finally, it should be mentioned that it is unrealistic to believe that any efficiency gains in the Office du Niger (and the Malian rice sector as a whole) will lead to self-sufficiency if changes in dietary habits and population growth are not addressed.

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