

The Rice Supply Chain In France: Issues, Strategies And Future Developments

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The European economic crisis is affecting even the agriculture and food sectors. In particular, the European rice-growing countries are facing an increasing situation of stress and problems due to the costs of rice production. In this context, the normative evolution related to CAP will be reducing help to agriculture, bringing European rice farmers to their knees, especially the small ones. This is a case study of the present situation in France, a country where, although rice production is marginal within the European context, the structure of the supply chain and the ability to promote rice as a product could give food for thought for a further comparison with Italy and Europe. The aim of this paper is to analyse the organization of the French supply chain as a whole and how this can have a positive impact on the promotion of the product "rice". The awareness of these dynamics allows us to start a comparison with the Italian rice supply chain, which needs deep changes in the light of the introduction of the new CAP regulations.

JEL Codes: L11, Q13, O13

1. Introduction

In this context of general economic crisis, in which all sectors are trying to do their best to survive, also the sectors connected with agriculture are considering to find new procedures for this purpose. In particular these negative consequences will mostly affect the rice sector, due to several factors: (i) the CAP normative evolution that implies the total decoupling of aids to the rice sector; (ii) consequently the fixed costs of production will become unsustainable for several rice farmers who will have to cope with the reduction of aids from the new CAP; (iii) rice millers will change their paddy suppliers as they are not willing to buy it at the price fixed by European farmers, preferring lower prices and therefore turning to extra European markets.

The rice sector is aware of this risk of collapse, and to contrast the fall of this sector, the firms involved are evaluating policies to slow down the consequences of the negative effects that will come from the aids cuts. In this context, it's clear that CAP aids to rice production have always guaranteed a minimum income to farmers and have helped to keep alive a sector that would have already collapsed without them. Therefore, in the changing European normative background, it is interesting to analyse the situation of the various European rice sectors threatened by the regular paddy and rice imports from Asian countries. In addition, the study and analysis of promotion strategies both for the

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"product" rice and the "region" where rice is grown, are important to understand the problems related to this sector and can represent - as a positive result of a comparison between the strategies adopted by other European countries - a useful parameter to develop possible solutions to be taken.

That is why this work focuses on the present situation in France. The French grow about 120,000 tons of Paddy rice, which is 0.16 ‰ of the world production. The production area is located in the south of the country, specifically in Camargue, a region where 200 rice farmers cultivate an area of 19,000 hectares. The CAP funds for this European country - managed by the public body FranceAgrimer – were € 100,000 in 2012, compared to € 500,000 in the previous year (Source: FranceAgrimer data).

The results of the present analysis offer a new contribution to the literature about rice production and rice promotion strategies; in particular, as it is well described in paragraph 2, there are no similar works in French literature that focus on these topics and offer practical solutions and a comparison with other European countries. Therefore this is a starting point for a kind of literature that aims at analysing the relationships between the various parts of the production chain, in particular rice production at a local and even European level. Moreover, this first work will give a clear picture of the relationships between the most important rice growing European countries (Spain, Greece), and the comparison of the results will help to improve the Italian rice growing sector.

The research questions this study wants to answer are the following:

- (i) what is the role and impact of the local bodies that affect the analysed sectors?
- (ii) what are the problems in the rice supply chain studied in Camargue, in the light of the CAP normative evolution?
- (iii) what are the strategies to promote rice as a product, in order to evaluate their possible improvement and to compare them with the ones adopted in Italy?

The paper is organized along the following lines: Section 2 reviews the literature developing around the term "supply chain", showing the lack of studies focused on the identification of the existing relations in the rice supply chain. We develop the section by listing a number of hypotheses concerning the research questions. Section 3 provides the research methodology. Analyses and Results are then presented in Section 4 before the conclusion in Section 5, which shows the discussion of the findings and, finally, the research limitations and hints for further research.

2. Literature Review

This research focuses on the analysis of the French rice supply chain, studying in depth the mechanisms and proceedings adopted by the French rice farmers and rice millers, in order to evaluate their strategies in terms of promotion of the product.

The term "supply chain" comes from the French "filière", that means: "la succession d'états à traverser, de degrés à franchir, de formalités à accomplir avant de parvenir à un résultat" (Robert, 1990). Specifically, this word has developed a double meaning:

- a) according to Strambi (2004), as a concept related to a theoretical instrument, it has the function to represent some kinds of economic relations and interdependencies in a general and abstract way;
- b) according to Bellon (1989), as an alternative method to analyse productive reality. In this specific case, the "supply chain" method is preferred because it offers a broader

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perspective as compared to the analysis methods of the "economic sector", "industry district" and "region policy" (Strambi, 2004).

Recent studies (De Mauro, 1992; Saccomandi, 1999; Falletti, 2006) have underlined that the above-mentioned investigations haven't been analytical enough because the term "supply chain" hasn't always been used with the same meaning. Sometimes it was referred to in terms of productive "system", some other times it referred to the production "chain", or to the "itinerary" followed during the production processes and so on. However, it has to be noticed that both notions contain the idea of "connection", "relation", "interdependency" of the different activities involved in the production of a certain item of goods.

What the various scholars share is the tendency to identify the production chain as a "process" that does not involve only entrepreneurs and has the "product" as identifying element both in terms of intermediate and final goods, despite the fact that the operating economic subjects hold a main role in the production process.

As for the concept of supply chain in economic dealings, it rises from the intensifying of inter sectorial relations that characterises the processing cycle from agricultural product to food (Stefani, 1994). The "supply chain" model of analysis has been increasingly successful because it allows to analyse the food processing cycles recognising the different contributions: (i) to agricultural production, (ii) to the processing industry and (iii) to food retailing.

According to Malassis and Ghersi (1995) the production chain represents the itinerary followed by a product in the food processing system and involves the whole (i) of the actors (companies and administrations), (ii) of the steps that contribute to the manufacture and delivery of the goods to the final consumer and (iii) of the connected flows; in detail, the main elements to be analysed are two:

- Identification of the products, itineraries, actors and operations;
- Adjusting methods, i.e. the analysis of the behaviour of the actors, of the functioning of markets, of price formation.

Other scholars, like Saccomandi (1991), state that the production chain can be understood as the whole of the technological production steps, which are separate and separable, connected to the use of a specific resource or to the achievement of a specific product. It represents a vertical segmentation of the food processing system, according to product categories, and the connection between the different technological phases is given by the materials (of raw materials and final products) financial and informative flows.

Within our analysis, the English word "supply chain" represents the net of the involved organisations that can be identified upstream and downstream in the various processes and activities that create a value in terms of products and services for the final consumer/customer (Christopher, 1998).

For what concerns rice and its supply chain, we cannot find authors that have focused on the identification of the existent relations in the rice chain, both in Italy and in France. Italian and French literatures (Baldi, 1991; Banterle, 1991; Candiotta, 1996; FAO, USDA, Eurostat reports) focus on the production analysis, on rice consumption, on CAP aspects and related impacts, analyses that estimate, or try to, the impact not on the production chain, but on only one of the subjects: the farmer. In particular, locally in France there are

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the FranceAgrimer reports on market trends – a public body whose function is described in the following paragraphs - and the technical-scientific studies of INRA - National Institute of Food Processing Research - on rice growing and on the impact CAP changes will have on the income of the companies that work in this sector.

During the visit in Camargue the authors met the dean of the faculty of economics at the French University Montpellier 1. They wanted to find out if studies or reports had already been carried out in France on problems of rice production chain and strategies to promote the product. The result of the research was negative because French scholars have never shown interest in analysing the strategies adopted by the companies in this sector, as they were not food processing multinationals, which are their main subject of their studies.

That being stated, the hypotheses that the authors suggest in reply to the research questions previously mentioned are the following:

- (i) as to the role and the impact of the local bodies that affect the analysed sectors, the authors think that they cooperate and support the rice sector in particular, which has a closer impact on the region;
- (ii) as to the problems of the rice production chain in Camargue, in the light of the CAP normative changes, the authors consider that the main problems are related to very high production costs which would become unsustainable without the CAP aids;
- (iii) as to the strategies to promote the product "rice", the authors think that at present the strategies are winning and in constant evolution, due to the surviving of this crop on such a small area; however, without a specific literature on the topic, the analysis itself will lead them to the possible results.

3. Methodology and Model

In order to test hypotheses, the authors match an abstract deductive element to an inductive pragmatic approach (through the analysis and evaluation of an empirical case). This choice is adopted in order to test the existence of literature that allows the analysis and the understanding of the French organisational model of the rice supply chain and to carry out field research to verify the hypotheses.

This study is the result of a research carried out in the south of France, specifically in Camargue. As already mentioned in the previous paragraph, the authors have chosen the approach suggested by Malassis and Gherzi (1995) aiming at identifying the product "riz du Camargue" through the itineraries, the actors and the operations used to let the product reach the final customer. Moreover some interviews have been carried out using the semi structured interview method with the interlocutors (Corbetta, 1999), because the research did not imply interviewing a large number of actors and the non-structured approach would allow to show the informal ties that exist within the production chain, which are often stronger than the formal ones.

The French subjects we interviewed and involved in this research are members of the four most important French organisations in the food processing sectors: (i) FranceAgrimer, (ii) Syndicat des Riziculteurs de France et Filière, (iii) Centre Français du Riz e (iv) Institut National de la Recherche Agronomique.

The first paragraphs connected to the present analysis contain a short description of the role of these bodies, in order to understand their role and impact on the paddy and rice sectors.

4. Analysis

The analysis is divided into two main topics:

1. paragraph 4.1 deals with the description of the bodies and operators that influence the analysed sectors; in particular: (i) understanding the role of the State in the food processing context, above all, the activities run by FranceAgrimer state body; (ii) the role and description of the trade organisations based in the region;
2. paragraph 4.2 faces the topics which are the "core" of the research, that is:
 - (i) problems in the Camargue rice cultivated area, in the south of France;
 - (ii) analysis of the promotion strategies in Camargue that will clearly show how important the area is in this context;
 - (iii) analysis of the rice production chain in Camargue, firstly by analysing the activity of rice farmers and then the activities of rice companies belonging to the sector.

Finally, paragraph 4.3 explains the results of the research questions, comparing them to the authors' hypotheses.

4.1 Bodies Supporting the Rice Production Chain

4.1.1 Role of the State in the Food Processing Sector: Franceagrimer

The French State contributes to promoting Camargue rice through local offices of the Ministry of Agriculture, called FranceAgrimer. FranceAgrimer is a public body spinning off from the Ministry of Agriculture, which helps agricultural and food processing companies. In the French city of Marseille there is an office of this body, which deals exclusively with the rice production chain and works closely with rice farmers and rice industry companies in Camargue.

FranceAgrimer's supporting job provides fundings for the companies of the sector for promotion and research projects. This body controls all the funds coming both from the State and from Europe, investing in various developing projects of the production chain. Funds from the State and the EU are added to those coming from TFA (taxe fiscale affectée), a tax paid by all cereal-growing farmers. It also has a fundamental role for the storage bodies as it guarantees them with the banks to allow them to receive loans for their production activities.

However, to make this possible, the storage body has to validate the volume and the value of its stock with FranceAgrimer, which issues deposits that will be used by the banks to grant loans to the companies. These funds play a fundamental role in the operative and financial activities of the businesses of the sector.

4.1.2 Organisations Located in the Country

This paragraph briefly describes the French trade Organisations of rice farmers and rice millers:

- (i) The "Syndicat des Riziculteurs de France et Filière", also defined with the acronym "SRFF";
- (ii) The "Centre Français du Riz" also defined with the acronym "CFR".

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All the organizations involved in the rice sector have merged in the Organisation called "Syndicat des Riziculteurs de France et Filière" (SRFF).

The most important priority of this Trade Union is to guarantee the interests of rice farmers and rice millers, working out the future economic trends of these sectors, evaluating them and suggesting further developments. The Trade union developed the IGP trade mark and is the Organism of Management and Protection of the trade mark "Riz de Camargue IGP"; SRFF receives fundings from producers and manufacturers, from FranceAgrimer, from the PACA region, the Languedoc Roussillon region, from the Bouches du Rhône regional council and from the European Agricultural Fund for Rural Development (EAFRD). This body creates actions of communication and promotion to the final consumers and retailers, of production promotion, of protection of the image of the Camargue rice.

The Centre Français du Riz (CFR) is another organization created by the synergy among the different subjects of the sector; it has a strong relation with the trade union and shares both its head quarters (Mas de Sonnailler at Gimeaux) and the President with them. Originated by rice farmers, this research center has the task to give them tools to produce a better rice quality at competitive prices and with environmental sustainable methods. In this respect, it experiments growing techniques and selects the breeds of plants that are most suitable to the characteristics of the crop environment. One of the hardest challenges this body is involved in is to introduce, among the rice farmers' growing methods, the practice of growing "pure" breeds, which is missing in Camargue. Such practice of growing pure breeds can become a strong point in promoting quality rice; that is why, its implementation is necessary in order to allow the companies in the sector to be more competitive in the market.

CFR collaborates closely with INRA (Institut National de la Recherche Agronomique), which is one of the best research centres in the world for importance and numbers of publications.

4.2 The Rice Supply Chain: Issues and Strategies for the Development of the Market

4.2.1 Issues in Rice Cultivated Areas in the South of France: Camargue

The rice growing situation in Camargue is very peculiar. The supply chain activities in this geographical area of France is a source of jobs for the citizens, as it gives "life" to the suburbs. The balance of the ecosystem depends on rice growing. Should the rice growing activity in Camargue stop, the consequences would be negative in two scopes:

- (i) Lack of income for the farmers.
- (ii) Incalculable environmental damage, caused by the high salinity in soil. Rice growing decreases the level of salinity, because the Rhône water is pumped and used to water rice fields, thus reducing its salt quantity. "Natural" Camargue soil is characterised by a high level of salt, which wouldn't permit any other agricultural activity.

In this context, bearing in mind the high production costs to grow rice – compared to alternative crops like wheat and other cereals and legumes - the total decoupling of CAP aids is endangering rice farming in Camargue as well as in the rest of Europe.

4.2.2 Promoting Strategies in the Rice Growing Camargue Region

The main feature in using the region as a promotion element of Camargue rice is the regional park called "Park Naturel Régional de Camargue".

The regional Camargue Park is 100 million hectares wide and in it rice fields alternate with other crops. This site, which is well-known world-wide for its natural beauty, attracts lots of tourists from different countries. This park is not only a geographical area, but it is also a State Organism and a group of people who have developed an important partnership network time after time. As a state body, among other functions, it is involved in the socio-economic development of Camargue, thanks to this important partners' network, and it promotes a wide range of typical products, including rice. Because it promotes local products, the park has the role of a public body, whose action benefits local producers.

All the activities are financed both by the state and the EU. These activities mainly focus on:

- Local product fairs.
- Day trips at the parks.
- Communication campaigns in the schools, through the school canteens, with the aim to introduce Camargue rice to the students.
- A variety of leaflets and posters.
- Partnership agreements, for example with the International Conservatory of Mediterranean Cooking to invite them to use Camargue rice during their exhibitions.
- Complimentary gift boxes to visitors and tourists coming to the park.

4.2.3 Rice Promoting Strategies in Camargue and Connected Issues

In order to promote "Camargue rice", its Protected Geographical Indication (PGI) has been awarded at European level. It is a quality certification closely linked to the growing area. In the Camargue context, the PGI European award has partly contributed to enhance the of rice of the region, but not enough as only a little percentage of the packed product is labelled with the PGI logo. Around 80~90% of Camargue rice production comes from the PGI area, but only 18% of this production shows the geographical identification logo of Camargue on its packaging. This is caused by the fact that many companies that buy the processed rice from storage sites to pack it, prefer to use their own brand, which is already familiar to and appreciated by the consumer. In this context, then, a possible successful strategy to follow consists in promoting Camargue PGI with the consumers in order to find tangible economic benefits that are very low nowadays if compared to the costs of growing rice in compliance with the clauses of the farming code of practice.

The consumers' perception of PGI rice product is an important issue to work on: rather than a flag to wave to attract their interest in the final product, PGI in Camargue is seen more as a quality certification and an instrument of traceability.

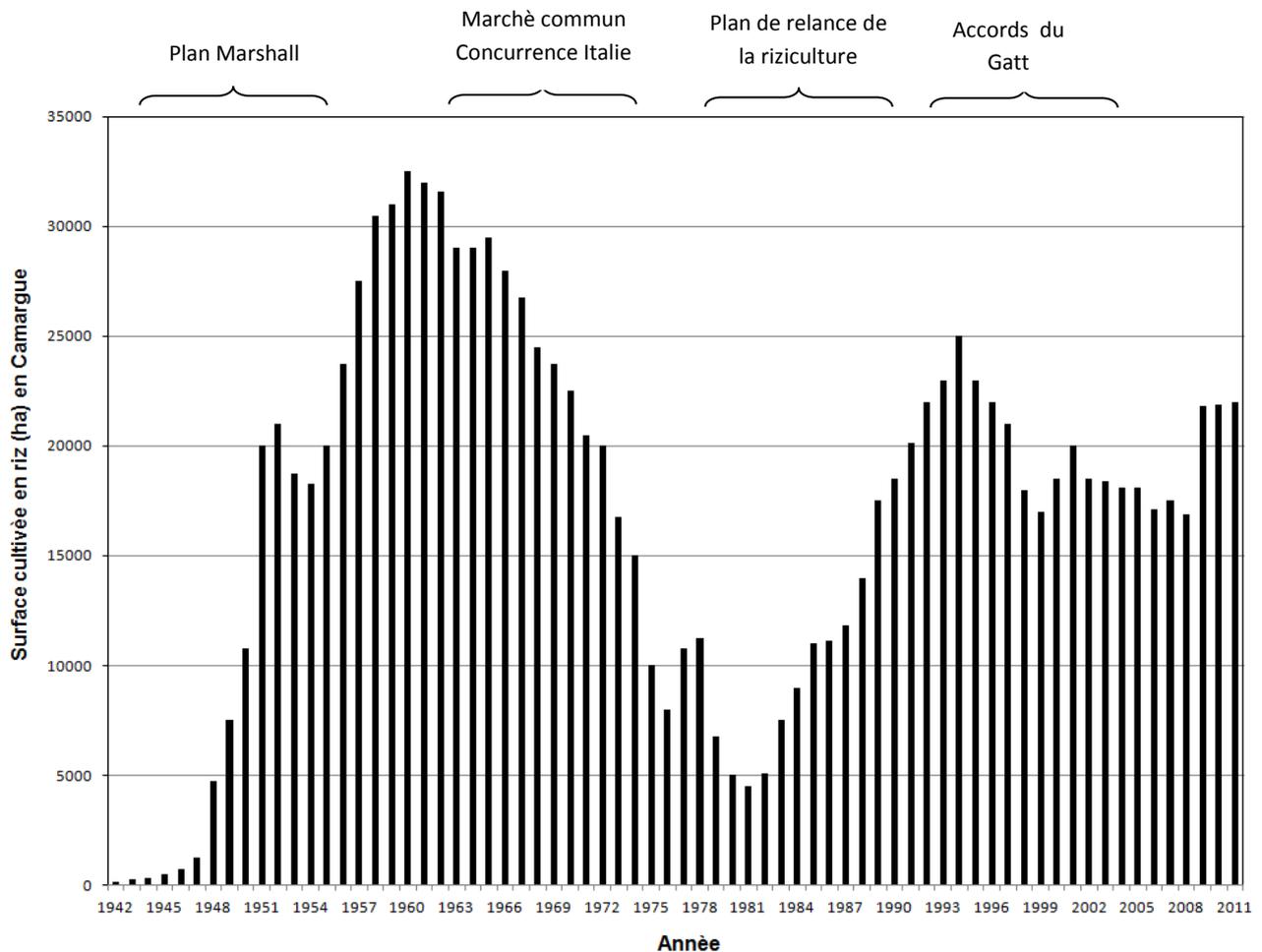
4.2.4 Camargue Rice Supply Chain: Rice Farmers and Rice Millers

In Camargue the area grown with rice includes the four departments of Bouches du Rhones, Gard, Vaucluse a Aude and covers about 19 million hectares with a yearly production that ranges from 100~120 million tons (FranceAgrimer, 2013). Graph 1 shows the historic trend of rice grown area from 1900 to 2011, underlining three main phases: the first, from early fifties to early sixties with an exponential growth until the entry of France in

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the European Common Market, where competition with Italy leads to a drastic decline in grown surfaces, the second, in the early eighties, concomitant with French rice recovery plan (Plan de relance de la riziculture) supported by the representatives of rice production with the support of the Camargue Regional Natural and the third, in the mid ninety years, with the fall of the price of conventional rice due to the GATT 1994 agreements, leads to a slight decrease in areas grown with rice.

Graph 1: Rice grown area till 2011 Source: Mouret (2011)



According to the French Ministry of Agriculture, all the paddy production must be taken to storage organisms, which are four in Camargue:

- Sud Céréales.
- SARL Thomas.
- Comptoir Agricole du Languedoc Silos Madar.
- Silos de Tourtoulén.

With a storage of 60,000 tons, Sud Céréales cooperative has been in Camargue since 1970 while the others have joined the market more recently. SARL Thomas is quite a small competitor with a storage capacity of 6,000/7,000 tons per year of organic rice. Le Comptoir Agricole du Languedoc owned by Mr Madar stores 29,000 tons of traditional rice and 1,000 of organic rice and finally the Tourtoulén silo has been working since 1989, stores around 10,000 tons of rice and imports about 5,000 tons from Spain, Italy, India and Pakistan.

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This kind of organisation of the rice supply chain, characterised by a concentration of supply, limits speculation on the raw material price.

4.2.4.1 Rice Growing Farms

Most rice farmers in Camargue are paddy suppliers and deal with the storage firm directly. In this context, the selling price is fixed according to the price trend at Vercelli (Italy) Commodity Exchange Market. Rice prices in France are based on Vercelli Commodity Exchange because there is no public body in France which is able to fix a national price for this commodity. 70% of the value of their crop is given to rice farmers. The remaining 30% is paid in two further instalments taking into account all the positive and negative market variations of that year.

Rice farmers pay a sum of around € 35 per ton to store their crops in the storage firms' warehouses plus another tax, the TFA (taxe fiscale affectée) to FranceAgrimer. In this situation rice farmers have no bargaining power because they are subjected to a price referred to a reality - the Italian one - which is completely different from theirs, not only from the point of view of production costs but also of market trends and inside operating mechanisms.

In that regard, some measures were taken in 2012 - based on the idea of a sector operator – in order to free French rice prices from the link to Vercelli. An Internet site was created (a kind of online market) where rice farmers offer a certain quantity of rice they have available and fix their own selling price. The dealings with prospective buyers are always made on line and the goods are sold as soon as both parties come to an agreement.

With time, this method of having supply and demand meet could become a reference market to fix rice prices at national level.

4.2.4.2 Storage Firms

The main operations in storage companies are:

- Production (not everyone).
- Drying.
- Parboiling (not everyone).
- Hulling.
- Whitening.
- Oiling or talc and glucose coating (not everyone).
- Packaging (not everyone).

In France, there are four main outlets for the stock that is concentrated at the storage companies:

- Industrial customers (industries that package with their own label).
- "Beyond families" customers (restaurants, hotels, catering companies, school canteens, etc.).
- "Family" customers (through mass market retailers).
- Organic rice.

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The supply chain of organic rice was born in Camargue at the beginning of the 90s. SARL Thomas is the main subject of the supply chain together with BioSud. SARL Thomas collects paddy from eight suppliers, thus allowing direct control and traceability of the product that is meant for children food and therefore must comply with extremely strict standards.

BioSud is a company whose 33% belongs to SARL Thomas itself. The aim of BioSud is to organise a sub supply chain of organic rice and rice for children food (Baby Food). This company was born with the purpose of gathering and trading all the organic rice of Sud Céréales and SARL Thomas; in particular, rice is mainly sold through Danone and Nestlé, while a minor quantity is sold through Biocoop and Carrefour.

In order to avoid conflicts and to keep the market balanced, the storage companies have come to an agreement and each mainly supplies one of the four groups of customers.

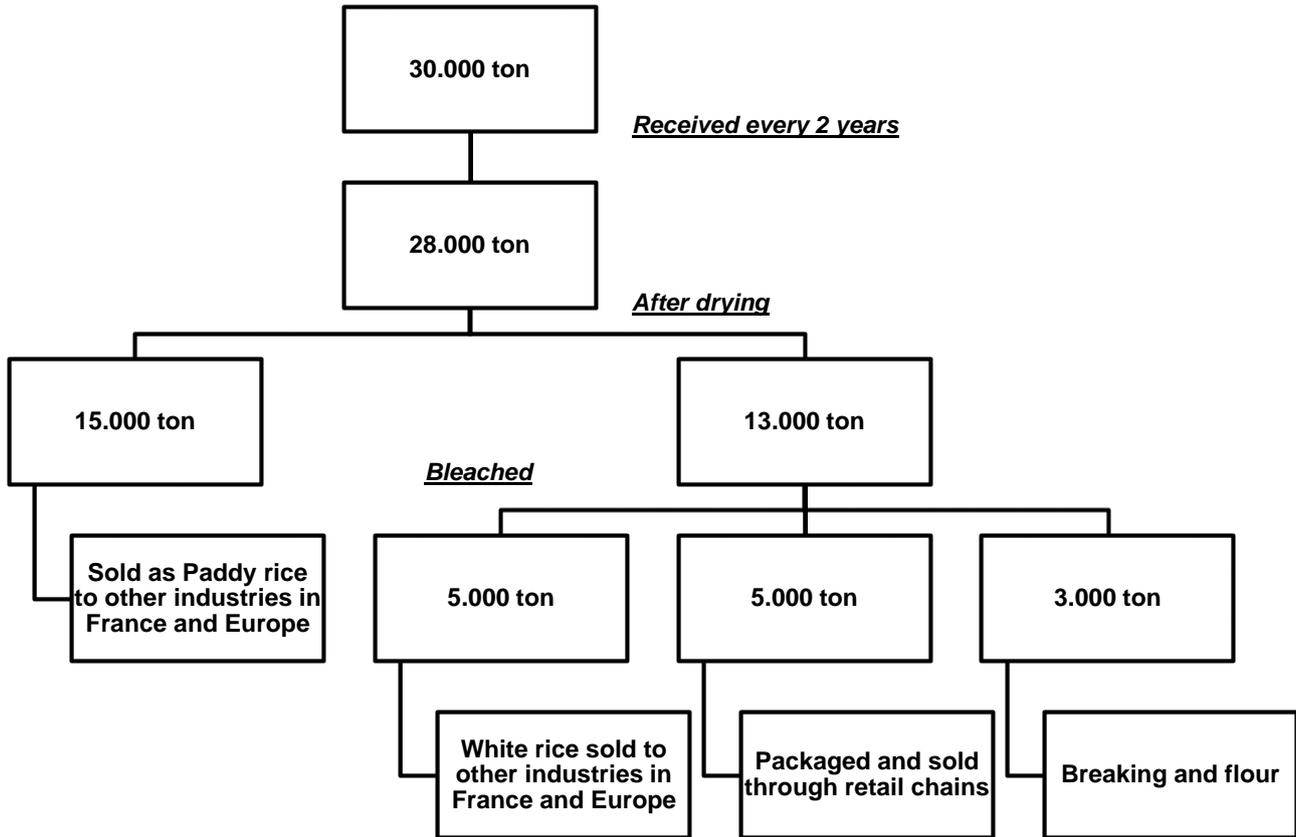
To enhance the promotion of the product, some storage companies also invest in innovation, in order to attract consumers towards a new product. An example is the "brown rice" made by Tourtoulén rice mill. It is a different product from traditional rice (which is usually without pericarp and bud). Brown rice is more interesting from a nutritional point of view although its cooking time is longer (around 30 minutes). The company laboratory is completing an experimentation to sell brown rice with 12-minute cooking time. The company investment in this research has no direct profit because it does not package the product; it sells it to another company, which packages it and sells it with its own trade mark. Tourtoulén can achieve positive feedback from this innovation only if the new product creates a new market segment, which can help sell part of its stock. Therefore, the future prospects of this company aim at the development of new rice products with high healthy value.

It's interesting to remind of the characteristics of two of the three main storage companies: Sud Céréales and Silos Madar also sell to retailers with their own trade mark. Sud Céréales has merged with an important food processing group (Souflet Alimentaire Group with its world wide famous trade mark "Vivienne paille") which doesn't only offer consumers traditional rice in grains but has also diversified rice use in different food products. Silos Madar trades part of its rice with the well-known trade mark "Taureau ailé".

As time goes by, the storage companies are changing their strategic behaviour and tend to abandon the main role they have been made for - to concentrate the supply in order to keep the market better balanced. During the years, the storage companies have been able to integrate the subsequent production phases enhancing those products with higher surplus value.

An example is Silos Madar that nowadays packages the final product. In this respect, you can see in Diagram 1 how this company has managed to integrate many other operations and to offer even final products under some circumstances.

Diagram 1: Silos Midar's supply chain, 2013



4.3 Findings

The analyses described in the previous paragraphs 4.1 and 4.2 answer the research questions and confirm the authors' hypotheses. In particular, the outcomes are detailed below.

(i) Concerning the role and the impact of the bodies located in the region that affect the analysed sectors, the authors have hypothesised that they give collaboration and support in particular to the rice sector, which has a more direct impact on the region. To confirm what we have explained, the analyses clearly show that the Camargue region can boast support from public bodies, such as FranceAgrimer, which manages funds from both state and European Union to finance research and development projects of the rice supply chain. The region also boasts organisations such as SRFF and CFR, which evaluate the economic trend in the rice farming and rice milling sectors, suggest development projects and create communication and promotion actions for the product "rice"; moreover CFR wants to supply farmers with instruments to improve the product quality, so that they become more competitive on the market.

(ii) As to the problems of the rice supply chain in the Camargue region, in the light of the new CAP regulations, the authors have formed the hypothesis that the main problems are due to the very high production costs that will be unsustainable without CAP aids. Interviews to rice farmer representatives of the area have confirmed our hypothesis; a reduction in CAP aids could bring about farmers' impoverishment and a subsequent collapse of the rice supply chain as they wouldn't find it advantageous to grow rice any longer.

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The analyses have also led the authors to two unexpected findings:

1. because of the close relationship between rice growing and environmental protection, if farmers stop growing rice this would cause an unestimable environmental damage;
2. rice farms don't have bargaining power during paddy selling because they have to undergo a pricing system linked to the Italian market, very different from the French one.

(iii) Regarding the strategies to promote the product "rice", the authors have supposed that these strategies are successful at the moment and in constant evolution, as such crop survives on such a small area.

The analyses have confirmed the authors' hypothesis but have also shown some weak points in the promotion strategies that can undergo closer examination and improvement. In particular, an important rice promotion strategy has been identified in Camargue: the achievement of a PGI certification, acknowledged all over Europe. However, the weak point in such strategy is the limited use of the PGI logo on the packaged product and, as a result, little brand awareness from the final consumer.

5. Conclusions

The meetings and analyses carried out in the present research have allowed better understanding of the problems related to rice farming and rice milling in France, and even on the environment where the crop is sown.

If in the rest of Europe, due to the total decoupling of aids, farmers can choose to grow other crops with lower production costs without big consequences on the environment, the situation in Camargue is completely different. Here the environment would endure serious consequences because of the excessive salinity of its soil, hence the need to keep growing rice in this region. However, in the changing European regulation context, farmers need to have the right guarantee of getting income from their work.

In this context, we underline the positive evolution of the strategies adopted by storage companies, which aim at product differentiation strategies and better communication in order to make rice more attractive to the consumer, sustaining rice farming in Camargue in this way.

As a possible solution to the problem of decrease in farmers' income caused by aids reduction expected from CAP, stakeholders have conceived actions to promote rice production and the region as well. The strategies devised by regional bodies to develop the area have given good economic results; however, a lot has to be done to promote Camargue rice. Beside promoting the production and the region, strategies have to be implemented to reduce fixed costs and to increase production per hectare. In such a context, it is desirable that the normative changes expected at European level take into account the situation of a region that, despite being small, has its own working and environmental characteristics.

The present work is a contribution to the European literature in the agricultural and food field and, in particular, in the rice farming and rice milling sectors. Due to the lack of similar previous studies in literature, this work is an original and innovative contribution, which partly integrates the only literature about the supply chain concept from the point of view of applied research and strategic analysis.

The research was carried out in Camargue and has also allowed to create relations between Italian and French rice farming and rice milling, in order to study and face the problems and changes in European regulations through a well-established group of companies that have the same target: the survival of European rice farming.

The limits of the present work are the limited information about quantitative data, which were difficult to find. Besides, as we have analysed a context that had never been studied before, it was not possible to make comparisons with other authors' opinions.

The follow-up of the present work could be a comparison between the strategies adopted in other EU rice growing countries. In particular, the authors intend to develop this study starting from a comparison between the French supply chain strategies and the ones adopted by the Italian rice supply chain.

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Appendix

Diagram of the rice sector in the Camargue

Source: Quiedeville S., Durabilité systematique de la filière du riz camarguais: comparatif et interaction entre la sous-filière bio et conventionnelle, 2013.

