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Economic Analysis of the Rice's Competitiveness: Empirical Evidence of UNIRIZ_C on the Market of Glazoue in Benin

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

This paper aims to analyze the competitiveness of rice of a peasant organization on the market of Glazoué. By using the Policy Analysis Matrix (PAM) method, results show that the production of rice is an economically and financially profitable activity. This activity has a comparative advantage to compete with imported rice because the Cost of Domestic Resource (CDR) of the rice production is less than the unit. The transformation of the parboiled rice and white rice is an activity also financially and economically profitable. The parboiled rice has a comparative advantage to compete with imported rice, but the parboiled rice is more competitive than the white rice. For a better competitiveness of rice production and the UNIRIZ_C in a perspective of economy diversification, the development of dregs and Irrigation should be the priority of the policy makers in order to increase national productivity, to meet the local demand and to ensure food security in Benin.

Keywords: Competitiveness; rice; UNIRIZ_C; Glazoué; Benin.

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1. INTRODUCTION

In Benin, agriculture employs 90% of the rural population and 75% of the active population; it contributes up to 32.7% in the formation of the GDP, 75% in export revenue, 15% in the revenues of the State and provides about 70% of jobs [1]. Agriculture is therefore very important in the development and maintenance of the national economic growth. This sector is organized around the rents products and food products provided in large part by the rural household whether. As regards the food crops, cereals the more important are maize, millet/ sorghum, rice. Formerly consumed for the luxury, the rice is more and more consumed by urban and rural households, due to his easy and speedy cooking. Indeed, the offer of local rice production is less than its demand. Imports rice is therefore indispensable to fill the deficit. Many of the rural organizations are organized around the rice sector for meeting the local demand of the rice. The sustainability of these organizations depends on their competitiveness because certain of them not benefiting of a low cost will have to rely on the quality of their rice in order to win or maintain their share of the market.

The competitiveness of the rice sector has often been studied in general without that it is not interested in the particular situation of a peasant organization of the sector, taken in isolation, while the competitiveness of a sector in general does not include necessarily of a peasant organization taken in isolation. Historically Rice was a luxury consumed at the time of the Feast periods. It is progressively entered into the food habits in Benin. Rice currently represents in Benin the third cereal in terms of production after maize and sorghum and fact from the daily meals of the majority of the population. Following the 2007-2008 food crisis, the rice sector has been retained by the government of Benin as a priority sector in the strategic plan for the revitalization of the agricultural sector. Indeed, the rice requirements in progression, remain dissatisfied because of the low organization of the rice sector. From 69.206 tons in 2003, the production is approximately 110.800 tons in 2010 and is projected to reach 178,000 tons in 2018 [1]. The needs for rice consumption have progressed and have reached 25 to 30 kg/hab/year, or 175 000 to 210 000 tons a year [1] while the data in the ONASA show that the quantities of rice available per capita and per year are very low: 4.35 kg, 6.57 kg and 3.09 kg in 2007, 2008 and 2009 respectively [2]. The gap is regularly filled by imports. In 2007; 40% (or 50,000 tons of white rice) of national needs in the rice would be covered by imports and international aid (including Japan). However, the Benin benefiting from natural assets in favor of the culture of rice, with more than 205,000 ha of dregs, of which 9 449 ha in Glazoué. It follows a competition with the local rice product which does not impose. To palliate this situation and to initiate the rice sector development in Benin, the PNOPPA, and its local OP with the support of the NGO VECO and the super Belgian market Colruyt, have undertaken an experiment aimed at strengthening the competitiveness of this sector. Many are these OP having benefited from this support which the UNIRIZ_C of Glazoué. One of the objectives pursued by these organizations, is to improve the quality of the rice of the Department of the Collines to make it more competitive in the local, national and international market. This competitiveness depends on the value chain (production, processing, and marketing). Within the UNIRIZ_C, these links in the chain are organized by the farmers and producers and transformative technologies that are grouped into GVP, UCR and URFERC. The UNIRIZ_C is facing the problem of competitiveness because of the quality of the local rice, which was regarded as the rice with a high rate of breakage, too sticky and expensive without having idea of its very rich nutritional constituents. The production is all the more determined by its business opportunities (simple accelerator [3], the UNIRIZ_C cannot ensure opportunities for its product. The capacity of the UNIRIZ_C to maintain or increase its market share remains compromised. Therefore the sustainability of the Union depends on the competitiveness of its product. The commune of Glazoué being an important production area of rice (19 453 tons in 2010). (CeCPA Glazoue). It houses a large market which occupies a better position at the national level especially in regard to food products. It urges to point out, the self-consumption is really significant in the areas of agricultural production. A first justification of the study is to know, how the local rice from the UNIRIZ_C stands out from its competitors, the imported rice. Another thing is to know, if in an environment of self-consumption, the rice of the UNIRIZ_C with its quality and its particularity is consumed for its merits.

2. LITERATURE REVIEW

In economic, the comparative advantage is the main concept of the traditional theory of international trade. It has been approached by Robert Torrens in 1815, and demonstrated for the first time by the British economist [4] in its "Principles of Political Economy and Taxation". The theory associated with the comparative advantage explains that, in a context of free trade, each country, if it specializes in the production for which it has the strongest productivity or the less weak, compared to its partners, achieve higher its national wealth. This production is the one for which it has a comparative advantage. In the sub-region, particularly in Benin, the rice sector has been for more than a decade the subject of many studies. The balance sheet of these studies is presented more or less as follows:

Adegbola [5] with the PAM have analyzed the competitiveness of local rice in Benin, it result that systems of irrigated rice farming and dreg have a comparative advantage in the production of rice to compete with the imports of this commodity in the production area. It is the same with the non-developed dreg in the Center and the north of Benin using the improved variety and/or fertilizer, and non-developed dreg in the north-west using the improved variety and the fertilizer (or animal traction). On the contrary, the systems of non-developed dreg in the South, the north-east and north-west producing the local variety Gambiaka and that of the north-west cultivating improved varieties but with a job entirely manual, do not have a comparative advantage in the production of rice.

Houndékon [6] studied the competitiveness of rice in the North Benin with the policy analysis matrix (PAM). In all of the systems he has identified, only those irrigated and non-developed dreg have a comparative advantage to produce the rice and compete with imports in their area. It is also evident from his analysis that the production of rice is profitable in all the systems and the irrigated system allows farmers to realize the higher profit per hectare in the case the device of irrigation would work correctly. By comparing the rice to the other cultures of the area, he has also shown that this irrigated system is financially more profitable. The analysis of the rice sector in Benin made by [7] has shown that marketing is the main objective of rice production. The findings of their study show that many producers use a part of the past harvest as seed to the next season of culture and in the north-west, the part of the consumption of rice is relatively high. In addition, the family labor constitutes the most solicited labor force in the activities of rice production. Rice-based systems in the north-east are relatively more mechanized than in the other regions. From the economic point of view, the costs analysis has shown that the cost of the employed labor force is the important part in all regions. The results obtained by [8] In a study of the competitiveness of the Beninese rice production with the policy analysis matrix (PAM) show that all the systems on the basis of irrigation as well as the dreg system have a comparative advantage in the production of rice to compete with the imports rice in the production area. For the systems basing on non-developed dreg, the situation presents itself differently depending on the considered regions. Then, the non-developed dreg system in the Center are competitive while those analyzed in the South are not. In the two regions (North-East and North-West), only the non-developed dreg system using the chemical fertilizer and/or animal traction are competitive. The only system of rice strict rain, analyzed in the center, has no comparative advantage in the production to compete with the imports of rice in the production area. It is the same for the northern systems based on the traditional seed.

Adegbola [8] using the PAM showed that at the level of the agro-ecological zones of the valley and the basin of the Anambé, systems of production, marketing and processing chain rice cultivation are all competitive. The study also concludes that the sector with the proceeding system sees its competitiveness to improve. In opposite, the marketing system, in its current organization does not favor producers and processors of rice. However, the CIR is still lower than the unit; this means that the production of the current technology considered has a comparative advantage. In other words, the production activity is economically efficient in all areas of production. It is less expensive in domestic resources to produce locally the considered commodity than import it. In Guinea the work of [9] have shown that the local rice appears competitive and contributes significantly to meet the challenge of food security. The progress in the improvement of the productivity are notably compared to the previous decade. However despite this performance, this competitiveness is always mitigated by structural dysfunctions at the level of the production areas (circuit of marketing, inaccessibility of the

production areas, difficulties to finance campaigns, insufficient security of land…) and increased competition from imported rice, which require a response on the part of the public authorities.

3. METHODOLOGY

3.1 Data Collection

The sampling is constituted of producers and the marketing agents (wholesalers, semi-wholesalers, retailers and final consumers) selected according to their availability and their accessibility during the survey. In order to determine the production, a sampling has been on producers of rice in13 villages of the commune of Glazoué. The criterion of producers' selection is their accessibility during the survey and their presence in the village during the passage of the data collector and their availability. The purpose of our sampling is to make the statistics of omitted commercial agents, producers and processors, who recognize the packaging of the UNIRIZ_C, who consume or not. The data are collected by questionnaire survey administered to commercial agents and by interview with interview guide administered to producers. At the level of the production, as UNIRIZ_C is likely to obtain supplies from producers of rice of the variety IR841 who are members or not of the UNIRIZ_C then the sampling will be extended on the producers that they are or are not members of the UNIRIZ_C. It is therefore assumed that the competitiveness of the link in the production of rice in Glazoué includes the competitiveness of the rice producers of the UNIRIZ_C. The information collected at the level of the production are relative to the performance, the quantity, and the cost of inputs (fertilizers, pesticides, seeds), labor, the sale price of the paddy, the quantity, the development costs, traction, etc. The study having taken place in the middle of the Campaign 2016 so we do not have the information on the performance of this campaign, it has proved essential to refer to the data in the Campaign 2015. However, in 2015 the pole of development of Glazoué has been very marked by the climatic stress, particularly the drought that has really is rampant. Indeed, the collected data have in average absurd variance, for example, in the pole of development of Glazoué yield per hectare of rice which was 3 to 4 tons per hectare to pass to some hundreds of kg and sometimes 0kg since, soils are prepared, abandoned in spite of the absence of rain and other have not completed the campaign therefore have not engaged the full costs. Under fear of climate stress, many farmers have grown only a small part of their surface area available during the 2016 campaign, cannot therefore be served as the 2016campaign as reference. It is essential to refer to the average data to analyze the competitiveness of the production of rice. At the level of the processing the information gathered are relative to the purchase price of the paddy, at a cost of shelling, the cost of drying, instruments and transformation tools, the depreciation of equipment, costs of sorting, of the costs of packaging, etc. These information are collected in the databases of the UNIRIZ_C and by interview of the women of the URFER_C. The commercial plan, the investigation is focused on households, retailers, the sellers, wholesalers or semi-wholesalers amounting to at least 100 meter of the structure of the UNIRIZ_C to the risk of not having a sample of 100% of people recognizing the rice of the UNIRIZ_C. The selected neighborhoods as places of inquiry are collateral to the large market of Glazoué and are home to the majority of potential consumers of rice. Note that the link of the marketing up to when is still not organized at the level of the UNIRIZ_C. The Union has not an official sales point to hand his seat. The faith of the independence constitutes an opportunity of advertising. The only costs incurred in the marketing are the costs of achieving the labels of advertising.

3.2 Data Analysis

Policy analysis matrix (PAM) is often used to study the competitiveness of the rice value chain within the UNIRIZ_C. According to [10] the PAM is a tool for the representation of a single or complex production system based on the construction of production accounts of representative agents of the system in two price systems to know the market price and the reference price. The prices of market or financial prices are the prices at which the farmer buys or sells. The prices of references (or economic prices) are the prices which would prevail in the absence of distortions on the markets of the factors and of the products. The PAM measure the impact of the price policies on the allocation of resources to the different stages of market of a stream (intermediate and finished products). It includes a line" to the market price" which resumed in line the figures of the financial analysis, a line" to the reference price" and a line for the calculation of the differences existing between the first two. It is as follows:

Table 1. Presentation of the schematic PAM

	Receipt	Exchangeable inputs	Domestic resources	Differences
The marketprice	Has	B	C	Of
Reference price	E	F	G	H
Transfer	I	I	K	The

Sources: Monke and Pearson, 1989

The 11 key indicators is that the PAM are presented in the following Table 2.

Table 2. Indicators of analysis

Financial profitability	D= (A-B-C)
Cost ratio-financial benefit	C/ (A-B)
Economic profitability	H=E-F-G
Cost in interior resources	G/(E-F)
Cost-benefit ratio economique	(f+g)/E
Transfer	The=I-J-K
Coefficient nominal protection	A/E
Coefficient effective protection	(A-B)/(E-F)
Profitability coefficient	D/H
Rates of subsidy producer	The/E
Equivalence producer subsidy	The/a

Source: Monke and Pearson1986

3.2.1 The ratio of the cost of domestic resource

(*CDR=G / (E-F)*) measure the effectiveness of the system to the reference price. It is the most commonly used indicator to assess if a productive system has a comparative advantage. As well, if the CDR<1, the system studied has a comparative advantage in the measure where it uses less of factors of production that it generates added value. Such a system allowing to save foreign exchange. A CDR>1 indicates in the contrary that the system studied uses more domestic resources (labor, capital) that it does not generate added value. If the CDR=1, the economic balance does not realize a gain or does not protect the external trade through domestic production. Incentives are the other indicators.

3.2.2 The ratio of the cost of factors or cost-benefit financial ratio

Is a direct measure of the motivation of the producers to produce a speculation. This ratio reflects the competitiveness or the efficiency of the production system in the market price. Calculated the price actually in force for the agents, this ratio indicates a private profit if it is less than 1.

3.2.3 The coefficient of nominal protection

(CNP = A / *E*) for the products and (*CPNIE= B / F*) for the exchangeable inputs, measure the report of the value between the products or inputs at the market price and the reference price. A CPN>1 indicates that the products (or the exchangeable inputs) are subsidized. If the CPN<1, the products (or the exchangeable inputs) are taxed.

3.2.4 The coefficient of effective protection

(CEP) is an aggregate measure of the rate of protection of the productive system taking into account at the same time the effects of distortions in the market for products and on that of the Exchangeable inputs.

3.2.5 The rate of subsidy

(RS) corresponds to the sum of the transfers reported to the value of the protection the reference price. It allows you to measure the magnitude of the degree of subsidy or of taxation which has suffered or the productive system considered. The methods of interpretations statistics are also used.

3.3 The Determination of the Private Price and the Social Price

The principle of the analysis by the reference price is to correct the distortions (domestic divergence and divergence at the border), using the accounting price applied in the framework of a theoretical calculation and to make appear the discrepancies between the accounts and reconstituted and the financial accounts of the real agents (individual accounts or the consolidated accounts Global). Once established the accounts of the chain, two major steps are to consider: the analysis of effectiveness which is essentially based on a valuation of the factors of production and goods and services produced in the prices of international parity, the analysis to social prices which integrates the estimation of the impact on consumption and savings of the

income distributed, as well as the political objectives of the distribution of income. Outside of the calculation of the price of parity to the import or export, the other main modes of conversion of existing prices in the reference price are based on the opportunity cost, the marginal productivity of the factors and the willingness to pay of consumers. The prices of goods and services consumed or produced by the sector: are valued at their price of parity (to the import or export as it is of inputs or product directly or reconstituted well in a similar way from their components (which appear in the production accounts-operating), eliminating all transfers, by correcting the cost factors non-exchangeable incorporated in the overall value. The choice of parity pricing is based on the finding commonly shared that, for most of the goods and services, the international prices reflect the better the price of effectiveness, because the exchanges with foreign countries generally offer the best alternative. The table below describes the determination of the parity price of the import and export: the costs considered in this sequence are valued to the prices of parity of the factors necessary to the processing or to the routing: prices in the sector of direct import (or of direct export) "competing" of the production chain studied, or prices such that they have been decomposed, segment by segment.

4. RESULTS AND ANALYSIS

The competitiveness of rice depends mainly on the paddy rice production. Indeed the analysis of the production channel cannot be addressed without taking account of the different factors that enter into the production and the different loads that bear the producers without forgetting the previous production. In addition a survey of 36 rice farmers distributed in 13 villages of 4 districts (Ouèdème, Thio, Sopkonta and Gome) has shown that the production of Glazoué is in majority ensured by the dacha, the Mahi and the fons with an average experience of 17 years. The family workforce is strongly solicited in these farms up to 76% of the size of the household, there also commits the part time workforce. Far from being of capitalist farms there is no permanent workforce. In spite of the financial weakness of the producers and of climate stress areas sown represent only 37.58% in 2015 and 35.9% in 2016 of the available area. Obviously, the area sown decreases because of the previous campaign unpleasant which does not encourage the producers and the request turned to imported rice. The enigma of climate stress began by has been raging since the four (04) years in the pole of development of Glazoué (Glazoué, Savè, Dassa-Zoumè, Ouèssè, Savalou, Bantè). As to returns it presents an absurd gap fort to the average which was 3 to 4 tons per hectare [9]. The most cultivated variety is the IR841. Producers are often brought to associate other cultures with the rice or diversify production to better address the risks of inclement weather and poor harvest. This production in which the raw material namely the seed is certified and almost assured by the traditional tools in non-developed or poorly constructed dregs . The ultimate source of water for the supply of dreg is the rain. The Phyto-sanitary products particularly the herbicide are used as well as chemical fertilizers (NPK and urea) and too little organic matter. It urge to notify that the supply of fertilizer is ensured by the Communal officer for Agricultural Development and period of penury by the private sector which augment its price from 12000 up to 14000FCFA. The latter is also a source of supply of certified seed from the seed companies, to the region. It is present at the side of the producers to accompany them in the process of production through agricultural advice. The rice is sold in the form paddy on the local market and also on markets associative. It is also sold after the shelling and or the drying. Producers are often confronted with problems of flow in spite of lack of means, lack of lessees, of the cost of transport and are sometimes forced to postpone the sale in several days if they know the slump in sales. The Paddy is sold to 160FCFA until the market and takes into account the cost of transport. It is also apparent that the management tools are little adapted and used, others use of the Booklets of management for Y mention the charges but do by rigor and importance. The route technique is more or less control. None of the producers has affirmed the presence of the State through the grants.

4.1 Processing

Two types of rice are derived from the processing such as parboiled rice and white rice. According to the account of operating the parboiled rice of the gem that represents the complex of drying of women members of the URFER-C via the UNIRIZ_C, the Paddy (the raw material) is assessed at a cost of 160 FCFA until on the transformation site. The various tasks essential for obtaining the parboiled rice are: the soaking, washing, the precooking, drying,

shelling, the calibration, sorting, and the packaging. Note that the manual work is intense. The costs related to washing, drying, sorting, cooking pre are essentially of labor costs. The costs of hulling and calibration are also compounds, we can distribute according to a ton in the following manner:

Cost of hulling = Cost of maneuver + cost of electricity + the + honorary the amortization (shelling and shelters) + cost of packaging + cost of abatement + other costs + the remuneration of the capital.

Cost of calibration = Cost of maneuver + cost of electricity + the + honorary depreciation + cost of abatement + other fee+ the remuneration of the capital.

The constituent ofGEM are: lever, homes, air drying, temper, sieve, and rails to perform the movement of the sieve. The use of the GEM is 4 times per week and 10 months per year. Taking account of the rate of breakage and potential losses in the course of the process, it saves at the end 650 kg of parboiled rice which 600 Long grain and the rest the broken rice. The first is to 500 FCFA kg and generally kept in a package of 5 kg. On the other hand, the second is to 250 FCFA. The other derivatives are not considered. There is a net margin per kg of 121.25 FCFA but due to the long-grain rice as proportionally distributed in the broken rice does not cover its production costs. Obviously the obtaining of parboiled rice and white rice is diverge about the hulling costs, calibration and sorting. The costs of hulling, calibration and sorting the parboiled rice are respectively in the amount of 15, 10 and 20 FCFA, while those of white rice are of an amount of 15,10 and 20 FCFA. This can be explained by the difference in quantity that enter in the shelling, the difference in the humidity and the uneven rate of breakage and impurity of these two types of rice. The white rice escapes the GEM. It urge to see that they are sold to the same price. After shelling one obtains 58% of white rice mixed either 580 kg whereas it is 65% of parboiled rice that it obtains either 650 kg. The net margin per kg of white rice is 89, 82 FCFA. The advantage to be a member of the UNIRIZ_C is to benefit from a net margin greater than that transformers not members who are to provide services by the UNIRIZ_C. The operating account of parboiled rice of a transformer not belonging to the UNIRIZ_C reflects this reality. The other costs are maintenance costs of the structure, electricity and other activities that are not directly related to the standard but which are necessary to the life of the company. The rice of the UNIRIZ_C is generally and often in a 5kg packaging, therefore the costs are assessed to the cost of this packaging.

4.2 Marketing

A survey conducted on 103 individuals of which 31 households; 29 retailers; 16 Sellers and 27 wholesalers or semi-wholesalers, for the verification of the recognition of the packaging of the rice of the UNIRIZ_C and its consumption (annex 8) has proved that 75,728% of consumers of rice in the commune of Glazoué do not recognize the packaging of the rice of the UNIRIZ_C, the local rice. Only 24,272% recognize the packaging, but there is that 56% of the latter who recognize and which consume the rice of the UNIRIZ_C therefore 13.59% of commercial agents omitted the producers and processors in the commune of Glazoué, which is inadequate as the share of the market. The remaining 44% of those who recognize the packaging of the UNIRIZ_C (who represent that 10.67% of consumers in the commune of Glazoué) and who do not consume evoke reasons of price and quality. Note that 100% of retailers do not recognize the packaging of the UNIRIZ_C (or the recognized only if they are members of the UNIRIZ_c) therefore does not consume. Other consume the rice of the UNIRIZ_C without recognizing its packaging. The GBOMINA's market is congested by the imported rice which in the field of price is competitive with respect to the rice of the UNIRIZ_C, we note Y is also of husked rice without sorting on the market. They are ready to buy the rice of the UNIRIZ_C at a lower price than that which is the practice now to either 400FCFA as the imported rice which has roughly the same characteristics that the rice of the UNIRIZ_C. A discount for resellers of rice from a certain quantity. They also suggest that the rice is available in the points of sale the more frequented and on the shelves which would only be possible if retailers take the rice at a lower price than on the one of the market which is 500FCFA.

4.3 Analysis of the Production's Operating Account

Rice production during the campaign 2015 is not cost effective and do not value the factors of productions that are solicited especially the painfully exploited labor do not know the merit of these efforts. We cannot expect to the development of a matrix of policy analysis in

such a condition (specified in the presentation of results), since the results are recorded in advance. Therefore in the presence of the climatic stresses such as that of the last 3 campaigns, rice production is hardly competitive especially the variety IR841, which is interested in the UNIRIZ_C, an essentially rainfed production. The account of operation following evidenced, it takes into account only the producers who have at least a superior performance to 0 kg per hectare.

The data used to draw the Policy Analysis Matrix of the production link are relative to the average production outside the climatic stress according to the practice peasant. It was noted that from 2007, the introduction of new varieties of rice generates a growth performance in the same way as the two parameters production and area to achieve 3500 kg/ha in 2010 [11]. They are reflected in the following Table 4.

The Table 4, present the data at the market price, the reference prices for goods are obtained by constructing the table PAM. About the recipe to the reference price, the calculation of the parity price of the paddy rice to the import is important and is presented in the following Table 5.

Of this matrix emerge the indicators for the assessment of the link in the following production. They are recorded in the following Table 5a.

The production of rice is an economically and financially profitable activity. It has a comparative advantage to compete with the parboiled rice imported since the CDR is lower than the unit. This stipulates that the chain of value added uses less of factors of production that it generates value added. The rate of subsidy and grant equivalence all being less than a this

Table 3. Production's operating account of the campaign 2015

Production (0.3t/ha) 48 350	Labor	149 040.625
	Seed	14 750
	Fertilizer	237.5 31
	Herbicide	7 625
The margin of producers -154 303.125	Total	202 253.125

Source: Authors, 2016

Table 4. Operating account of the production

Designations	**Unit**	**Quantity**	**P. Unit**	**Amount**
Performance kg/ha	**Kg**		**3500**	**3500**
NPK fertilisers (FCFA/ha)	Bag	3	14000	42000
Urea fertilizer (FCFA/ha)	Bag	1	14000	14000
Herbicide	Toner bottle	1	5500	5500
Seed (FCFA/ha)	Ha	50	300	15000
Labor manual (FCFA/ha)	Locker	25	1000	25000
Planishing (FCFA/ha)	Locker	25	1000	25000
Seedlings (FCFA/ha)	Locker	25 1000	1000/20m²	25000
Herbicidage	Man day	5	1000	5000
1 hoeing (FCFA/ha)	Locker	25	1000	25000
Epandage NPK (FCFA/ha)	Man day	5	1000	5000
2 hoeing (FCFA/ha)	Locker	25	1000	25000
Epandage urea (FCFA/ha)	Man day	5	1000	5000
Purge (FCFA/ha)				10 000
Harvest and put in boots (FCFA/ha)	Locker	25	500	12500
Total cost (FCFA/ha)				239,000
Sales price paddy (FCFA/kg)		**1**	**150**	150
Gross income (FCFA/ha)		**3500**	**150**	525000
Gross margin (FCFA/ha)				286000
Unit Cost (FCFA/kg)				68.28
Gross margin (FCFA/kg)				81,71

Source: UNIRIZ_C, 2011

Table 5. The PAM of the production

Fcfa/ha	Revenue	Exchangeable property	The property is non-redeemable for cash	Divergence
The market price	Has	B	C	Of
	525000	69680	218500	236820
Reference price	E	F	G	H
	420000	63669	219340	136991
Transfer	I	I	K	The
	105000	6011	840	99829

Source: Author, 2016

Table 5a. Summary of indicators for the PAM's analysis: Production

1. Financial profitability	[D = A - B -C]	236 820
2. Cost-financial benefit	[c / (A - B)]	0.480
3. Economic profitability	[H = E - F - G]	136 991
4. Cost domestic resources	[G / (E - F)]	0.616
5. Cost-benefit economique	[(F + G) / E]	0.674
6. Transfers	[The = I - J - K]	99 829
7. Coefficient nominal protection	[A / E]	1,250
8. Coefficient effective protection	[(A - B) /(E- F)]	1,278
9. Profitability coefficient	[D / H]	1,729
10. Grant rates producer	[The / E]	0.238
11. Equiv. Producer subsidy	[The / A]	.190

Source: Author, 2016

stipulates that producers suffer a taxation. But they enjoyed an incentive to produce rice as the SCE is less than 1. The link is therefore protected by the policies of the State. The ratio of the cost of the factors being lower than the unit (0.48<1), this reflects the motivation of producers to produce rice, it stipulates that the link is competitive and efficient on the market price and releases a private profit. The discrepancy between the obtaining of the parboiled rice and white rice is the reason of a first separation of the matrices of these two types of rice. But they will be articulated then in an aggregate matrix. At the end of the analysis of the processing link the price of gender parity at the import will be assessed to the cost price to retailers, since the price system of the UNIRIZ-C being a little rigid, cannot be reviewed to adapt to the system of prices wholesalers in the locality. The price charged on the various markets is a function of the quality of the rice, the rate of breakage, the packaging. By making use of these characteristics of the rice of the UNIRIZ-C, it is possible to compare the type of imported rice which is closer of a cost price to the retailer of 400F CFA.

It shows two PAM in the area of processing according that the rice is Parboiled or white which are as follows Table 6.

Table 6. PAM of the parboiled rice

Fcfa/ha	Revenue	Exchangeable goods	Non-exchangeable goods	Divergence
The market price	Has	B	C	Of
	312500	30253	205114	77133
Reference price	E	F	G	H
	260000	31236	199175	29590
Transfer	I	I	K	The
	52500	-983	5940	47543

Source : Author, 2016

Of this matrix emerge the indicators for the assessment of the link of the transformation of the parboiled rice following. They are recorded in the following Table 7.

The obtaining of the parboiled rice is an economically and financially profitable activity. It has a comparative advantage to compete with the parboiled rice imported since the Cost of Domestic Resource (CDR) is lower than the unit. This stipulates that the chain of value added uses less of factors of production that it generates value added. The rate of subsidy and grant equivalence all being less than stipulates that producers suffer a taxation. But they enjoyed an incentive to produce rice as the SCE is less than 1. The link is therefore protected by the policies of the State. The ratio of the cost of the factors being lower than the unit (0.727<1). This reflects the motivation of transformers to produce the parboiled rice, it stipulates that the link is competitive and efficient on the market price and releases a private profit. As regards the white rice the results of analysis lead to the following Table 8.

Of this matrix emerge the indicators for the assessment of the link of the processing of the white rice. They are recorded in the following Table 9.

Table 7. Summary of indicators for the PAM's analysis: Parboiled rice

1. Financial profitability	[D = A - B - C]	77 133
2. Cost-financial Benefit	[c / (A - B)]	0.727
3. Economic profitability	[H = E - F - G]	29 590
4. Cost domestic resources	[G / (E - F)]	0,871
5. Cost-benefit economique	[(F + G) / E]	0,886
6. Transfers	[The = I - J - K]	47 543
7. Coefficient nominal protection	[A / E]	1,202
7A. Coefficient nominal protection	[A* / E*]	
8. Coefficient effective protection	[(A - B) / (E - F)]	1.234
9. Profitability coefficient	[D / H]	2,607
10. Grant rates producer	[The / E]	0.183
11. Equiv. producer subsidy	[THE / A]	0.152

Source: Author, 2016

Table 8. PAM of the white rice

Fcfa/ha	Revenue	Exchangeable goods	Non-exchangeable goods	Divergence
The market price	Has	B	C	Of
	253600	26882	177389	49329
Reference price	E	F	G	H
	232000	26984	174606	30412
Transfer	I	I	K	The
	21600	-100	2783	18917

Source: Author, 2016

Table 9. Summary of indicators of PAM's analysis: White rice

1. Financial profitability	[D = A - B - C]	49 329
2. Cost-financial benefit	[c / (A - B)]	0,782
3. Economic profitability	[H = E - F - G]	30 412
4. Cost domestic resources	[G / (E - F)]	0.852
5. Cost-benefit economique	[(F + G) / E]	0.869
6. Transfers	[The = I - J - K]	18 917
7. Coefficient nominal protection	[A / E]	1,093
8. Coefficient effective protection	[(A - B) / (E - F)]	1,106
9. Profitability coefficient	[D / H]	1,622
10. Grant rates producer	[The / E]	0.082
11. Equiv. producer subsidy	[The / A]	0.075

Source: Author, 2016

The production of the white rice is an economically and financially profitable activity. It has a comparative advantage to compete with the white rice imported since the cost of Domestic Resource (CDR) is lower than the unit. This stipulates that the chain of value added uses less of factors of production that it generates added value. The products (inputs) exchangeable involved are subsidized, the rates of subsidy and grant equivalence being all less than 1. It stipulates that producers suffer a taxation. But they enjoyed an incentive to produce rice as the SCE is less than 1. The link is therefore protected by the policies of the State. The ratio of the cost of the factors being lower than the unit (0,782<1), this reflects the motivation of transformers to produce the white rice, it stipulates that the link is competitive and efficient on the market price and releases a private profit.

4.4 Marketing

Starting from the idea that Glazoué is an area of agricultural production, second in rice cultivation behind the Malanville (19 453 ton in 2010), the consumption is high which explains the low demand of the rice locally product. The Commune of Glazoué houses the third great international market; indeed we note a large mass of rice imported, which limits the market share of local rice because of its relatively low price. The results of analyzes have shown that in the majority consumers do not take into account the quality. The rice of the UNIRIZ_C is naturally fragrant and very rich in nutrient, it is packaged with a low rate of breakage and impurity. Taking account of its quality and its composition, it has the merit to be appreciated to its relatively low price compared to the prices of other fragrant rice imported. However, the

Table 10. Determination of the parity price

Sector producing for the domestic market: Parity price to import	Sector producing for the international market: Parity price to export
World Price foreign port (fob)	World Price foreign port (FCA)
+	-
Brokerage, freight, insurance,… (Put to CIF)	Brokerage, freight, insurance,… (Put to CIF)
=	=
Border price (CIF) At the port of entry	Border price (FOB) The output port
+	-
Customs, transit, storage	Customs, transit, storage
+	-
Transport	Transport
+	-
Packaging, final transformation	Packaging, final transformation
+	-
Transport	Transport
+	-
Possible transformations, transport	Possible transformations, transport
+	-
Marketing	Marketing
+	-
The collection	The collection
=	=
Edge price-field	Edge price-field
-	-
Costs of production	Costs of production
=	=
Producer margin (rawproduct)	Producer margin (rawproduct)

Source: FAO, 2005

system of fixed price is not favorable to the commercial agents (retailers, wholesalers and semi-wholesalers) which explains in from the absence of the rice of the UNIRIZ_C on the shelves and on the points of sale. Therefore, households that is to say the last consumers are more willing to consume the rice of the UNIRIZ_C, which explains their share very high in the rice consumers of the UNIRIZ_C, either 71,428% get it on the processing site.

It is possible to distinguish: Commodities or services traded internationally or may be the subject of international trade: they are valued at the price of the international market to their point of entry or exit from the country. It then adjusts this price in function of the necessary costs (valued in reference price) of routing and processing existing between the "border point" and the point of production or of use; commodities and services that are indirectly the subject of international trade: their value is broken down according to their production account-operating in tradable elements (inputs imported or which could be) and non-exchangeable, goods and non-tradable services: commodity and Services could not be the subject of international trade (such as the Earth) are assessed according to their marginal value of production if these are factors of production, and according to the criterion of the "Willingness To Pay" of consumers if it is of goods and end services. [12]. The following table summarizes the commodities according to their types (redeemable or non-exchangeable).

Table 11. Determination of the price of parity

Tradable goods	Non-tradables
Rice, fertilizer, herbicide,	Land, labor, capital

Source: Author, 2016

Table 12. Classification of commodities processing level

Exchangeable goods	Non- exchangeable goods
Paddy, white rice and parboiled rice	Labor, capital

Source: Author, 2016

According to [6], in the production of rice in the different systems of production of rice the Earth is obtained either by inheritance or by donation. This indicates a relative abundance of the earth in these areas of production. The rice lands have for the most part an opportunity cost lower, especially when they are not appointed [13-14]. Thus, in the framework of this study, the economic cost of the land has been regarded as null.

The method of amortization of sustainable equipment is the method of linear constant. The depreciation depends on the duration of the life of the equipment, its residual value e its coefficient of use at the time of the work to which it is sought. As regards the amortization of traditional tools, the cost of the labor is fully assessed to what we would pay if the work was ensured by the casual laborers, it is estimated that they take account of the renewal of their rudimentary equipment of work before fixing the cost. For this, the amortization of traditional tools is included in the labor force of operations in which they are solicited. There are three types of labor: The workforce family, the permanent workforce and labor casual. While the cost of labor will be evaluated at the Labor occasional then the farms being not to be capitalists there is of permanent employee and also the management tools less adapted do not arrive to enhance the workforce family. Since the cost of labor takes into account the renewal of traditional equipment, the decomposition coefficient of the labor force is 0.5 for unskilled labor, 0.2 for the capital and 0.3 for the exchangeable inputs (intermediate consumption). The exchangeable inputs (intermediate consumption) are of equipment acquired among the countries in the vicinity therefore undergo only half of the normal tax which is 18% of the acquired value. The capital is paid at 5% at the market price and to 1% the reference price. The ad valorem tax on the exchangeable inputs is 18%. The reference exchange rate is 1.03. The inputs are decomposed in capital, skilled labor or not and in exchangeable inputs. The UNIRIZ_C being a peasant organization, it does not pay to direct tax on its production. Among the tradable goods found the rice and the inputs (fertilizers and herbicides). Financial prices of all these assets are determined on the basis of the data in the local market. For the determination of the price of parity of the white rice and the parboiled rice, it is considered the equivalent of the rice of the UNIRIZ_C on the local market and considers the cost of this imported rice to retailers such as the price of parity of the white rice and the parboiled rice. The price of parity of the paddy rice has been evaluated to its price adjusted border by the rights of customs, the costs of storage and transport up to the area of consumption. It is

possible to distinguish: Goods or services traded internationally or may be the subject of international trade: They are valued at the price of the international market to their point of entry or exit from the country. It then adjusts this price in function of the necessary costs (valued in reference price) of routing and processing existing between the "border point" and the point of production or of use; goods and services that are indirectly the subject of international trade: Their value is broken down according to their production account-operating in tradable elements (inputs imported or which could be) and non-exchangeable, goods and non-tradable services: Goods and Services could not be the subject of international trade (such as the Earth) are assessed according to their marginal value of production if it is of factors of production, and according to the criterion of the "Willingness To Pay" of consumers if it is of goods and end services [12-15].

5. CONCLUSION

The results of the policy analysis matrix (PAM) show the value chain rice within the UNIRIZ_c is competitive and has comparative advantage to compete with imported rice. This sector is protected by the policies of the State. But in terms of prices, the rice of the UNIRIZ_C is not competitive. The rice of the UNIRIZ_C is more expensive than the imported rice, 500 FCFA against 400FCFA. But the mention is that the rice of the UNIRIZ_C (IR841) is appreciated for its quality. It urge to mention that the production is threatened. Rice production being essentially pluvial, the last three years have been particularly marked by the drought in the pole of development of Glazoué, performance evolved considerably downward at the point where the production is not profitable. In these times the UNIRIZ_C is supplied with other producers of the Center. For these reasons we suggest that the State: to continue its actions in the agricultural sector and to act now to ensure the organizations benefiting from direct grant to enable them to benefit low costs. Indeed, the UNIRIZ_C can initiate its competitiveness in terms of price and increase its opportunities in revisiting its system; Encourage the funding systems adapted to agriculture, the mechanization of Rice activities to limit the manual work in order to win time for other activities that between in the framework of the sector. This can in the medium term to reduce the production cost and allow economies of scale; encourages research in the channel for the discovery of varieties more tolerant to drought. The new improved varieties are more competitive than the local varieties as Gambiaka; makes available the inputs to limit oligopoly costs; invest in the development and irrigation of the surfaces of production to counter the producers against the climatic stress.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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