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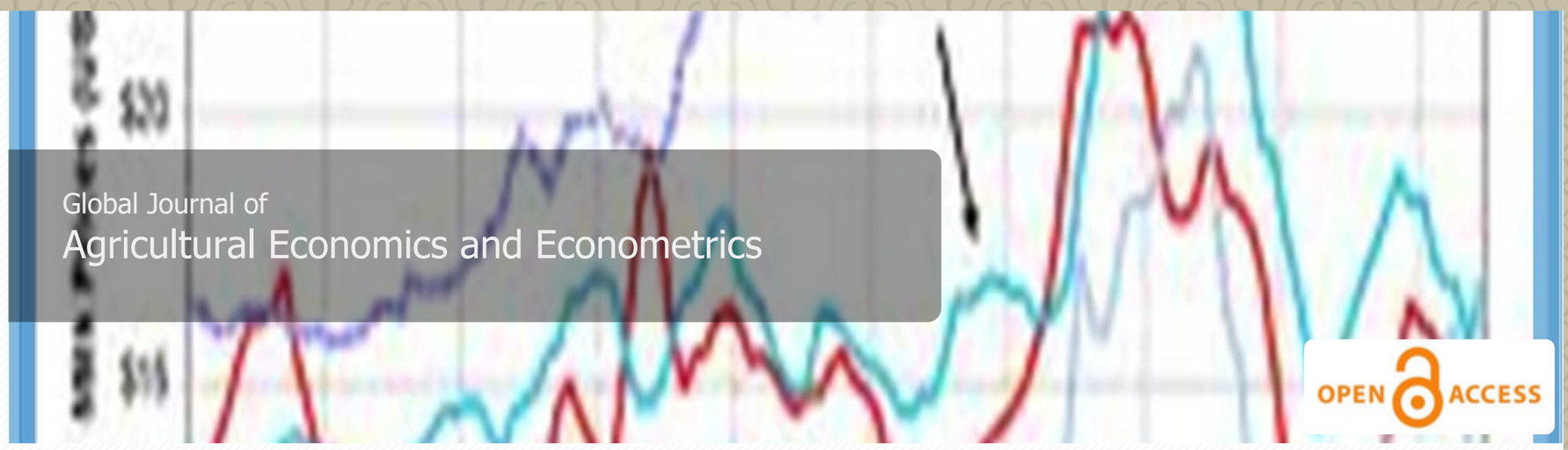

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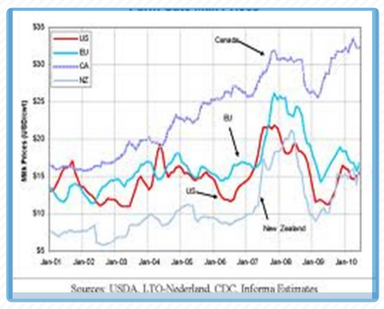

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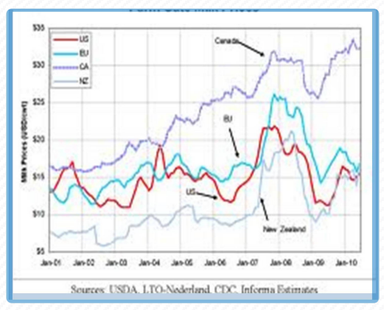

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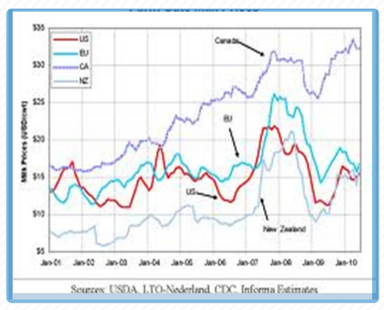

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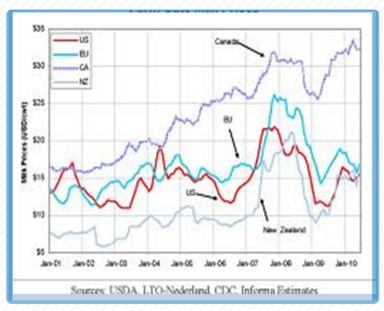

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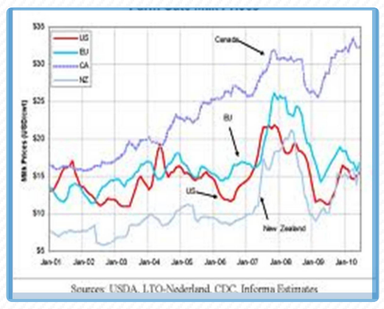

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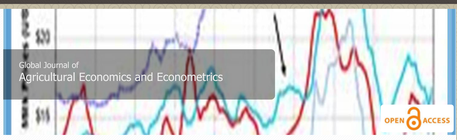

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Rice-growers technical efficiency determinants in Benin: An approach by stochastic border

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For a few years, rice has been part of cereals the most consumed in Benin. This fact, its culture profits nowadays from a great political interest within the framework of the development of the sectors.This article aims to analyze the technical efficiency of rice-growers in the town of Glazoué. The results of the stochastic production border estimates overall show the inefficiency with an average efficiency index of 60.6% and 98.65231% of the differences at the border are related to the technical inefficiency of the producers. There is scope for increasing rice production in this municipality while keeping the level of inputs used inchanged. Furthermore, the distribution of efficiency indices shows that 46.67% of rice-growers recorded low technical efficiency scores between 0 and 50%. For any action to improve the technical efficiency of rice-growers, one must take into account variable such membership in a grouping, capital invested, labor and area planted that exercise a meaningful influence on the rice-growers technical efficiency.

Keywords: Glazoué, rice production, stochastic border, technical efficiency

Jel: C23, C24, Q12, Q18, Q32.

INTRODUCTION

In the township of Glazoué the conditions édaphiques and climatic possibilities of extension of the exploitations rizicoles and improvement of the productivity encourage the zone extensively. The middle yearly pluviometric is from 959.56 to 1 255.5 mm; the middle temperature varies between 24 and 29°C. The hydrography is constituted on the one hand, of an important river that is the Ouémé stream. That waters the township to the level of the villages of Aklampa, Béthel, Riffo, and of a part of the precinct of Zaffé and on the other hand of small local rivers that encourage the development of the market gardening of against season and the activities of fishings (Abel, 2009.). Besides, one meets in some villages of the township, a certain soil of shallow often eroded fertile and auspicious to the culture of rice.

The link of the rice production is the most dynamic of by the obstruction and the organization of the actors, the gotten productions and the different supports (LARES, 2011). The actors of this link are organized to the level of the village until the national level through the Council of Dialogue of the Rice Producers of Benin. The link of the specific inputs and facilities presents different faces. If the inputs as seeds certified of rice are more and more present, the specific manures are not always available. The manures food and cotton that are used are not put in place in time, compromising often the work of the producers.

Concerning the links transformation and merchandising, they also know some evolutions even though they are even shy. In the same way, the units of transformation don't have clear mechanisms of provision again in paddy. For what is of the merchandising of rice manufactured, the circuits are not yet organized or are little effective. The local rice is very little present on the urban markets; what is also the result of a strong consumption of rice in the zones of production.

Unfortunately, the results are not at the height of the waiting. Because, numerous difficulties and constraints always wear down the development of path rice.

To the number of these constraints and difficulties, the most important are: the difficulties of access to the specific inputs, the weak level of planning of the shallows, the absence of credits adapted to the needs of the direct actors of the path, the weak level of organization and professionalization of the actors of the path, the absence of reliable statistics, the absence of mechanisms of believable information, the absence of regulation of the imports of rice. The development of the path passes by the resolution of these constraints.

To surmount these constraints and to improve the contribution of the rice produce in Benin, it is imperious to analyze the technical efficiency of the producers in order to identify the main determinants, in an optics of a lasting food security. Because, rice constitutes one of the cereals mostly consumed and of which the potential in earth for its production exists in Benin, notably in Glazoué (FAO, 1997, LARES, 2011, ONASA, 1999).
However, the imports of rice continue to be the main source of provision for national demand. Many farmers' organisations mobilized around this traffic in order to satisfy the local demand. Even so, the rice-grow is confronted to several constraints among which the availability of quality seed and the non mastery of water (CCR-B, 2011).The continuation of the article approaches successively: survey of the theoretical and empirical literature (§ 2), sources of data and methods of evaluations (§ 3), methodology of analysis of the data and the models of evaluation (§ 4), results of this article (§ 5), discussion of the aforesaid results (§ 6) and findings and suggestions (§ 7).

Theoretical and Empirical Survey

The notion of efficiency takes on a fundamental importance more and more in agriculture. This importance identifies through done numerous studies on nearly all continents. The different studies carried either on the agricultural products (cereals, cassava, cotton, banana), either on the raising of the dairy cows and pigs. This notion of efficiency is used for the first time by Koopmans (1951). Now our days, a more and more privileged reference in the analysis of performances of production units. The term efficiency regroups some notions of the microeconomic theory that are the function of production, the costs, the profit and the price. The concept of efficiency embodies three components that are the technical efficiency, allocative and economic (Xiaosong and Jeffrey, 1998).

Several approaches have been elaborated to estimate the borders of production and to measure the level of efficiency. These approaches can be classified, according to the shape presumed of the border, according to the technique of evaluation used to get the border and according to the nature and the properties supposed of the gap between the observed production and the maximal production. The first distinction permits to dissociate two categories of approaches: the parametric approaches and the non parametric approaches. The second distinction permits to fear the parametric approaches through two methods: the inferential methods and the descriptive methods. The last difference the stochastic borders of the deterministic borders.

The first studies on the measure of the efficiency begin with Farrell (1957), that being inspired by the works of Debreu (1951) and of Koopman (1951). These studies proposed a division of the efficiency of an exploitation in two components: the technical efficiency that represents the ability of an agricultural exploitation (or business) to produce a maximal level of output from a level given of inputs and the efficiency allocative that present the ability of an agricultural exploitation (or business) to use the inputs in optimal proportions, considering their respective prices and the available production technology. The combination of these two measures gives the economic efficiency level. During the last decades, the method developed by Farrell (op. cit.) knew some improvements. What encouraged numerous studies on the measure of level of efficiency of the peasants although Farrell was the precursor of the structure of the parametric production borders. One privileges today, the function of production of type Cobb-Douglas or type translog. The parametric functions of production can be stochastic or déterministes depending on whether one introduces there or no the uncertain term (or stochastic).

The non parametric methods, introduced by Charnes A., Cooper W.-W., Rhodes E. (1978), define a technical efficiency ratio with the help of a named approach Dated Envelopment Analysis (DEA). This approach permits to spread the measures of Farrell (1957) to a context of multiple products, but in presence of a technology to constant scale output. It is in 1984 that Charnes and al. (op. cit.), developed the axioms permitting the measure of the efficiency of a technology multi products to output of scale variables.

As for the stochastic borders, number of study indicates that the technical efficiency is the main source of variation between the level of production observed and the level of production border. Thus, Bravo-Ureta and Pinheiro (1997) value the indications of technical efficiency, allocative and economic of the cotton exploitations in the Parguay respectively of the order of 58%, 70% and 41%. Benaissa and al. (2010) show that the determinants of the technical efficiency are the domestic workforce, the adoption of the agricultural technical innovations. Kelemu and Negatu (2016) disassemble that the level of middle efficiency of the wheat producers is of 0,66; what implies an enormous potential to increase the production of wheat has a technological level existing and without supplementary investment in the agricultural research. Egzon and al. (2017) explain that the technical efficiency of 243 dairy exploitations in the Kosovo is the relation between the

variation of the technical efficiency and the size of the farm and the other primary determinants (age, availability of the earth, harnessed culture and the agricultural systems) of the technical efficiency. They confirm the middle technical efficiency of the dairy farms estimated to 0,72.

The works of Kwabena and Owusu (2014) analyze the technical efficiency of the agriculturists of corn via socioeconomic factors as age, the adoption of the agricultural innovations, the level of formation and education of the agricultural producers. They concluded that the sex, age, the fundamental property and the access to the credit influence positively and meaningfully the technical efficiency. In Zambia, the empiric works of Chiona and al. (2014) analyze the technical efficiency of the producers of corn while using the borders stochastic analysis.

Besides, for these authors, the factors that influence the technical efficiency of the production of corn are the certified hybrid seeds, the access to the loans and to the advice of popularization and the income out farm. They concluded on 400 households of the central province of Zambia that the middle technical efficiency was of 50%, with a minimum of 2% and a maximum of 84%. The distribution of the technical efficiency is as 14% of the agriculturists have some lower scores of efficiency to 30% whereas 46% of the agriculturists the scores superior to 50% and 14% has scores of efficiency technical superior to 70%.

In Latin America, Mónica and Salazar (2011) analyze the determinants of the efficiency of the small agriculturists of wheat in the region of Bío Bío (Chile) and to value its relation with a variety of variables, including the involvement of the agriculturists in the organizations. The results show that age, the education, the size of the exploitation, the degree of specialization and the dependence of the activity explain the levels of technical efficiency. In the same continent, Felippe and al. (2016) analyze the technical efficiency of the properties producing citrus fruits in the state of Sao Paulo, in 2015 and 2016. The results showed that a big part of the properties producing citrus fruits to Sao Paulo is inefficient and that the variables that contribute the more to increase the efficiency are the "formation of the producers" and "the experience as farming producer". On the other hand in the industrial sector, Hira and al. (2017) study the technical efficiency of the textile industry of Faisalabad. They confirm that the middle technical efficiency is of about 81%, what shows that the textile industry produces 81% of the total potential on average with given resources. In the banking sector, Dharmendra and Fida (2015) study the technical efficiency degree in the commercial banks of Oman while using the approach of the analysis of envelopment of data (DEA). They show that the size of the bank is petty; the profitability and the liquidity are meaningful positive explanatory variables. Nguyen (2017) analyzes the technical efficiency and the determinants of the production of white corn in the province of Vinh Long, to Vietnam, on the transverse data base collected in 2014 by 176 agriculturists of white corn. The results revealed that the technical efficiency varied from 63,46 to 99,54%, with an average of 82,58%.

In the domain of the fishing, Ele and Nkang (2014) analyze the technical efficiency and the determinants of the fishers on two seasons. The results show that work, the credit, the size of the stitches and the motorization were all of the meaningful variables to the level of 5% for the aggregated data. The middle technical efficiency was of 79% for the aggregated data, but 49,7% and 62,8% for the dry and rainy seasons respectively. The determinants of the technical efficiency are age, the experience of fishing and the level of education.

Data Sources and Evaluation Methods

In the setting of this article, 6 villages distributed in 6 precincts have been kept. The main criterias having acted as choice of these villages are among others, the importance of the rice production. To the level of every village, the producers have been investigated in an uncertain way. To the total, a strength of 100 producers has been investigated against a forecasting of 150; because of the unavailability of the producers because these last are taken by the rustic works. Finally, after purification (spoliation) a strength of 60 producers has been kept. The used data are primary and introverted by the rice producers during the period of August-September 2017.

On the one hand, these data concern the quantitative variables as: age, the number of experience year for the rice produce, the production, the surface seed, the number of cultivated varieties, the quantity of input, the number of equipment, the quantity of the workforce, etc. And on the other hand, these data concern the qualitative variables of which the sex, the matrimonial situation, the ethnic group, the producer's origin (native or foreign), the access to the credits, the fashion of acquirement of the earth, the formation, the adherence to a grouping, the application of manure, the main activity, the position in the household, etc. While referring to the literature, several methods are used by the authors to value the technical efficiency of the production.

METHODOLOGY AND ESTIMATE MODELS

This article uses the approach by the stochastic border of productionin order to identify the main determinants, in an optics of a lasting food security. The retained functional shape is the one of type Cobb-Douglas. Considering producer *i* that combines the factors of production as the capital, work, the surface seed, the herbicide and manure, the global shape of the model presents itself, as follows:

$$Ln(Prod_i) = \beta_0 + \beta_1 ln(Cap_i) + \beta_2 ln(WO_i) + \beta_3 ln(Sur_i) + \beta_4 ln(Herb_i)$$

$+ \beta_5 \ln(Man_i) + v_i - u_i$;
i: the rice producer *i* = 1…60;
n: the size of the sample; β ($\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$) is the vector of the parameters to estimate; it represents the springiness because the function of production is of type Cobb-Douglas; $Prod_i$: Production of rice (t) of *i*; Man_i: Total quantity of NPK manure and Urea used by *i* (Kg); $Herb_i$: Quantity of herbicide used in liter (L) by i; Sur_i: Surface seed by *i* in hectare, WO_i,: workforce used for the production (hj) by *i*, Cap_i,:invested capital by *i* (FCFA), v_i : the uncertain mistake term and u_i: the term of mistake that translates the *i* operator's technical inefficiency.

Let's note that the calculation of the times of works took place while choosing like unit of basis the man per day. For it, one used the coefficients of level-headedness applied by the FAO. These coefficients are expressed while being equivalent man per day. So, the times of works of the woman are multiplied by 0.75; for the less than 15 years, the coefficient is of 0.5. Then, one determines the times of works in homme/jour while dividing the total number of hours done by 8 (a man per dayis equivalent to 8 working hours per day). Two hypotheses are to consider concerning the terms of mistakes: does one suppose that $u_i$follows a normal law of parameters$\mathbb{N}$ (0, σ_u^2) and does $v_i$follow a truncated normal distribution that wants to say $v_i \rightarrow \mathbb{N}$ (0, σ_v^2). On the basis of those hypotheses, one gets from the Frontier program of Coelli (2004), the coefficients and $\sigma^2 = \sigma_v^2 + \sigma_u^2$;$\lambda = \sigma_u/\sigma_v$.

λ measures the part of the technical inefficiency in the total variation observed between the points on the border of production and the data. The procedure of evaluation of the production function is the one adopted by Coelli (op. cit.). It consists in maximizing the logarithm népérien of the verisimilitude function and to calculate the ratio of LR verisimilitude. The method frequently used to explain the levels efficiencies takes place in two stages. It first of all consists in estimating the levels of efficiency of the different operators, then to make a regression of its levels of efficiency according to some specific factors. In this article, these factors concern: age, the level of instruction of the operator, the access to the credit, the formation received by the operator, the adherence to a grouping, the surface seed of rice, the sex, the number of experience years in the rice produce, the main activity of the producer and the producer's origin. Thus, the Tobit model is used for the regression of this second stage that takes in account the censored character (enters 0 and 1) of the explained variable (technical efficiency). Positively the model presents itself as follows:

$TE_i = \alpha_0 + \alpha_1 Age_i + \alpha_2 YExp_i + \alpha_3 CuV + \alpha_4 Sex_i + \alpha_5 Inst_i + \alpha_6 Form_i + \alpha_7 Acc_i + \alpha_8 AdG_i + \alpha_9 Eth_i + \alpha_{10} Origin_i + \alpha_{11} MainA_i + \alpha_{12} Sur_i + \alpha_{13} Cap_i + \alpha_{14} Man_i + \alpha_{15} Herb_i + \alpha_{16} WO_i + \varepsilon_i$.

i: the producer, i=1…250 andε_i: the mistake term. One waits that these parameters are positive or negative; but the parameters of the variable Access, Form and AdGroups, that must be positive.

RESULTS

The analysis of this Table 1 (cf. Annex) shows that the average production in the zone of survey is estimated to 2.210833 tons with a very strong variation around 2.459349 tons. It explains the fact that the production varies strongly from a producer to another. The maximal production is of 12 tons and 0.1 for the minimal what justified the weakness of the rice production in the township of Glazoué. It bound maybe to the uncertain effects or the technical inefficiency of the producers. The producers invested capital is on average of 192 158 FCFA with a variation of 158 727 FCFA.

This state of thing translates the weakness of the investment in the rice-growing domain in the township of Glazoué. It could be responsible for the weakness of the production. The surface middle seed by the producers of the township is of 0.9483333 ha with a variation of 0.8284132 ha. It explains the artisanal and extensive character of the rice production in the township of Glazoué. It would probably be bound to the fundamental problem. The middle quantity of manure used is of 189.9583 Kg with a very big variation of about 194.0527 kg whereas the average is not of 4.091667 L for the herbicide with a variation of about 4.585803L. This maybe explained by the extensive character of the rice production in the township and the difficult access to the agricultural inputs.

The used total workforce is on average of 169.8167 Hjs with a big variation of about 261.4719 Hjs. It translates the fact that the quantity of work hand used varies from a producer to another since them emblavent not the same surfaces. The middle quantity of seed used by the producers is of 47.90833 Kg with a variation of the order of 40.36397 Kg because of the objectives different of production. The minimum is of 6Kg against the maximum of 200Kg. The middle age of the producers is of 42.13333 years with a variation of 11.19695 years. The minimum is of 20 years and the maximum is of 72 years. It is due to the fact that less and less the young are interested to agriculture.

Besides the culture of rice requires a minimum of experience in the domain. The number of experience means years to the level of the producers is of 13.81667 years with a variation of 6.614037 years. It explains that most producers practice the rice produce has it more than two decades. Thus, most producers master the practices culturales but the most often traditional. The average of the number of cultivated varieties to the level of the producers is of five (5) cultures with a variation of the order of 1.449722. This average can be explained by the fact that the producers vary the cultures to avoid some risks as the climatic risks, the risks of price, etc.

After evaluation of the model of the stochastic border of production (cf. Table 2 in Annex), the model can be presented under the following shape:

$Ln(Prod_i) = -4.431127 + 0.3846315ln(Cap_i) - 0.5612615ln(WO_i) + 0.6009388ln(Sur_i) - 0.2112155ln(Herb_i) + 0.7705188ln(Man_i)$

Besides, the Table 3, that presents the distribution of the scores of technical efficiency, watch that the producers of the township of Glazoué are inefficient with an average of efficiency of about 60.60127%. Indeed, about 46.67% of the producers have an indication of efficiency lower to 50%. besides, the frequencies of the producers having an indication of efficiency understood then between 50% and 60%, 60% and 70%, 70% and 80% between 80% and 100% are respectively 20%, 11.67%, 5% and 16.66%. The most efficient producer has a score of efficiency of about 0.997092

Table 1: Statistical descriptive of the variables of the model

Variables	Mean	Std.Dev	Minimum	Maximum
Prod	2.210833	2.459349	0.1	12
Cap	192158	158727	22950	732300
Sup	0.9483333	0.8284132	0.2	4
Eng	189.9583	194.0527	0	900
Herb	4.091667	4.585803	0	22
MO	169.8167	261.4719	17	1760
Sem	47.90833	40.36397	6	200
Age	42.13333	11.19695	20	72
AnExp	13.81667	6.614037	4	34
VarCult	5	1.449722	2	8

Source: Achieved by the author from STATA 11, September 2017

Table 2: Evaluation of the stochastic production border

Variables	Coefficients	Std.Dev.	Z	P > Z
lnCap	0.3846315	0.0000929	4138.26	0.000
LnMO	-0.5612615	0.0000413	-1.4e+4	0.000
lnSup	0.6009388	0.0001387	14331.45	0.000
lnHerb	-0.2112155	0.0000443	-4766,45	0.000
lnEng	0.7705188	0.0001073	7180.90	0.000
constante	-4.431127	0.0012469	-3553.72	0.000
σ^2	0.9732278	0.2051744		

Source: Achieved by the author from STATA 11, September 2017

Table 3: Distribution of the scores of technical efficiency

Efficiency index	Efficient	Frequencies (%)
[0 – 50 [	57	48.31
[50 - 60 [	26	22.03
[60 – 70 [	10	8.47
[70 – 80 [	7	5.93
[80 – 100[	18	15.26
Total	118	100
Minimum: 0.0080956 ; Mean: 0.6060127 ; Maximum: 0.997092 ; σ : 0.2395939		

Source: Achieved by the author from STATA 11, September 2017

Table 4: Result of the evaluation of the technical efficiency function

Variables	Coefficients	Std.Dev.	T	P > t
Age	-0.003446	0.0030398	-1.13	0.264
Year of experience	0.0017603	0.0055999	0.31	0.755
Cultivated variety	0.0563509	0.0274505	2.05	0.046
Sex	0.2555515	0.0872476	2.93	0.005
Instruction	0.0150965	0.0821557	0.18	0.855
Formation	-0.287689	0.1987355	-1.45	0.155
Access to the Credit	0.0413691	0.1270602	0.33	0.746
Adherence to a grouping	0.3175598	0.1682375	1.89	0.066
Ethnic group	0.0272861	0.0555066	0.49	0.625
Origin	-0.133472	0.0784887	-1.7	0.096
Main activity	0.0048821	0.0343235	0.14	0.888
Surface	-0.288495	0.0865193	-3.33	0.002
Capital	1.31e-6	6.49e-7	2.02	0.050
Manure	-0.000445	0.0004164	-1.07	0.289
Herbicide	0.0021936	0.0041196	0.53	0.597
Workforce	0.0005517	0.000215	2.57	0.014
Constant	0.3163676	0.2629622	1.20	0.235
σ^2	0.1998053	0.0187418		

Source: Achieved by the author from STATA 11, September 2017

against 0.0080956 at the very least efficient. These indications of efficiency gotten by the producers undergo very little variation of the order of 0.2395939. It explains that the technical efficiency varies very little from a producer to another. In other words, the producers of the township nearly have the same technical features.

After parameters evaluation of the technical efficiency (TE) of the rice production in the township of Glazoué (cf. Table 4 in annex), the model can be rewritten of the following manner:

TE_i = 0.3163676 - 0.003446Age_i +0.0017603$YExp_i$ + 0.0563509CuV_i + 0.2555515Sex_i + 0.0150945$Inst_i$ - 0.2876899$Form_i$+ 0.0413691$Acces_i$ + 0.3175598AdG_i + 0.0272861Eth_i - 0.1334722$Origin_i$ + 0.0048821$MainA_i$ - 0.2884958Sur_i + 1.31e-6Cap_i - 0.0004455Man_i + 0.0021936$Herb_i$ + 0.0005517WO_i.

The evaluation of the stochastic production border has been made by the method of verisimilitude maximum with a function of production of type Cobb-Douglas. Of this evaluation, is it to note first that the model is globally meaningful to the doorstep of 5% and is the parameter of efficiency superior to 0 ($\lambda > 0$), there is technical inefficiency existence therefore to the level of the rice production in the middle of survey and the gaps in the border are bound in part to the technical inefficiency of the producers (about 98.65231% of the gaps are bound to the technical inefficiency of the producers), the uncertain effects, as for them, are not responsible for the gaps in the border that with a rate of 0.00000295%. More exists thus to the level of the rice production possibilities of growth of this production while keeping unaltered the level of the inputs used. Thus, the rice producers of the township of Glazoué is technically inefficient. This inefficiency is owed to socioeconomic factors in part under their control. Because the uncertain factors have a weak influence on the gaps in the border. Secondly, the result of the evaluation of the border shows that most variables as the invested capital, the workforce, the level of instruction, the year of experience, the access to the credit, have a positive and meaningful impact in the doorstep of 5% on the production of rice in the Township of Glazoué. On the other hand, the variables as age, the formation, the origin, the surface seed and manure have a negative and meaningful impact in the doorstep of 10% on this production. Now debate these results.

DISCUSSIONS

It agrees to specify that our gotten results confirm those of number of previous studies. Thus, an increase of the invested capital dragged a proportional increase of the production, all things being otherwise equal. Indeed, the invested capital represents the advances to the production. What allows the rice producers to face the manual loads and to lead works in time. It is some in the same way of the other factors that influence the production

of rice positively in the township of Glazoué. This result is confirmed by the one of Yebou and Sikitatou (2016) that found that the factors as the instruction, the formation, the sex, the surface seed and the access to the credit influence the technical efficiency of the production of the Soy in the township of Savé.

In the same way, the adherence to a grouping exercises a positive and meaningful effect in the doorstep of 10% on the technical efficiency. This result explains that the producers members of a grouping are more efficient than those non members. Indeed, the groupings of producers are in contact with the agents of popularization and framing what allows them to receive some formations on the technical culturales. Besides, the producers members of an association share of the knowledge. This result is in adequacy with those of Tossou and Aïtchédji (2015). They find that the experience, the fashion of acquirement of the earth, the access to the credit and the adherence to a grouping villager is the determinants that influence the efficiency of the production of the corn positively in the zone of survey.

On the other hand, the variable Origin exercises a negative and meaningful influence to 10% of risk on the technical efficiency. Finally, the fact that the individual is native or foreign in the middle is a factor susceptible to influence the technical efficiency. Indeed, the native are in part landowners and can invest like good seems them on their earth whereas the strangers feel a certain reticence to invest on the earths to the risk to be deprived of these earths, best according to them is to cultivate without too to invest. The surface seed impacte negatively and meaningfully to a doorstep of 5% the technical efficiency of the production. This being, more the surface seed is raised less the technical efficiency is important. It results in the fact that the small producers are more efficient than the big producers. Indeed, the producer having emblavé a small surface succeeds on the one hand, in taking care perfectly and to take care of the cultures because having sufficiently of time what is not the case at the big operators.

On the other hand, the small producers in emblavant of small surface decrease in return the risks bound to the uncertain effects responsible for the inefficiency whereas the big operators make multiply these risks only what entails the weakness of this efficiency. This result is in conformity with the one of Arouna and Singbo (2005) for the analysis of the technical efficiency, allocative and economic of the units of production of the cashew nuts in Benin. These authors conclude that the big exploitations are less efficient than the small exploitations and therefore all action for the promotion of the path anacarde must be oriented as well toward the big that the small units.

ISSUES AND SUGGESTIONS

Of the results of this article, we can conclude that the middle score of technical efficiency of the producers of the township of Glazoué is of 60,6%. So, these producers are below the border. What shows that on the whole, the producers are technically inefficient in the production of rice. He/it exists therefore to the level of the rice production in the township of Glazoué of the possibilities of growth of the production while keeping unaltered the level of the inputs used. Besides, 98.65231% of the gaps to the border are bound to the technical inefficiency of the producers. The factors that influence this inefficiency meaningfully (efficiency) technique of the producers is among others the sex, the adherence to a grouping, the invested capital and the hand of work that influence this inefficiency positively (efficiency).

Those that impactent negatively and meaningfully this inefficiency (efficiency) technique is the producer's origin (native or foreign) and the surface seed. Let's note that the most efficient producer has a score of efficiency technical equal to 99.7092% whereas at the very least efficient, this score settles to 0.80956%. The middle production in the township is of 2.210833 what makes the rice produce to Glazoué an extensive culture. Numerous other features are to note at the rice producers of the township of Glazoué. Indeed, 93.33% of the producers don't nearly have access to the credit, close to the half of these producers are not instructed, the women are the most dominant to the level of the production with a frequency of about 55% of the producers. Besides, on the land, of the problems as the absence of out-flow market for rice and the climatic risks has been evoked by the producers. It agrees to solve its problems without delay.

REFERENCES

Abel G J (2009). Etude sur le développement des filières riz et maraîchage au Bénin.

Arouna A, Singbo A (2005). Analyse de l'efficacité technique, allocative et économique des unités de production des noix de cajoux au Bénin. Communication à l'Atelier National du Bénin.

Benaissa C, Solis D, Funtanilla M, Cabrera V (2010). Analyzing the determinants of technical efficiency among traditional dairy farms in Wisconsin: a quantile regression approach. Selected paper prepared for presentation at the Agricultural & Applied Economics Associations, CAES & WAEA. Joint Annual Meeting. Denver. Colorado, pp. 25-27.

Bravo-Ureta B, Pinheiro E (1997). Technique economic and allocative efficiency in peasant farming: evidence from the dominican Republic. The Developing Economics : pp. 48-67.

Charnes A, Cooper W, Rhodes E. (1978). Measuring the efficiency of European Journal of Observations Research.

Chiona S, Kalinda T, Tembo G (2014). Stochastic Frontier Analysis of the Technical Efficiency of Smallholder Maize Farmers in Central Province, Zambia. Journal of Agricultural Science. Published by Canadian Center of Science and Education. 6(1):

Coelli E (2004). Diversification economies and specialization efficiencies in a mixed food and coffee smallholder farming system in Papua New Guinea. Agricultural Economics. 31: 229-23.

Debreu D G (1951). The Coefficient of Resource Utilisation.Econometrica. 19: 273-292.

Dharmendra S, Fida B A (2015). Technical efficiency and its determinants: an empirical study on banking sector of Oman. Problems and Perspectives in Management. 13(1):

Egzon B, Wailes E J, Dixon B L, Muslu A, Durand A (2017). Factors affecting the technical efficiency of dairy farms in Kosovo. Journal of

Central European Agriculture. 18(4): 823-340.
Ele I E, Nkang M O (2014). Analysis of Production Determinants and Technical Efficiency in Crayfish Production in the Lower Cross River Basin, Nigeria. Quest Journals Journal of Research in Humanities and Social Science Volume 2 ~ Issue. 11: 30-36.
FAO (1997). Elaboration d'un plan national de relance de la filière riz. Rapport definitif.
Kelemu K, Negatu W (2016).Analysis of levels and determinants of technical efficiency of wheat producing farmers in Ethiopia. African Journal of Agricultural Research. 11: 3391-3403. September.
Kwabena N A, Owusu V (2014). Technical efficiency of maize farmers across various agro ecological zones of Ghana. Journal of Agriculture and Environmental Sciences. 3: 149-172.
Koopmans, T. C. (1951). An analysis of production as an efficient combination of activities. In activity analysis of production and allocation, by Koopmans T C, Cowles Commission for research in Economics, Monograph 13. New York: John-Wiley and Sons, Inc. l'efficacité économique des zones irriguées pour mieux gérer les inefficacités existantes. Actes de Séminaire Euro-Méditerranéen. Sousse, Tunisie.
Farrell, M J (1957). The measurement of productive efficiency. Journal of the Royal Statistical Society, 120 (3): 253–290
Felippe C, Silva V, Gomes F M (2016). Technical efficiency in Brazilian Citrus production. Economica Agraria Recursos Naturales (Agricultural and Resources' Economics), pp. 342-350.
Hira L, Irfan A, Sam A (2017). Technical efficiency and its determinants: a case study of faisalabad textile industry. City University Research JournalSpecial Issue: AIC, Malaysia, pp. 183-194.
LARES (2011). Composition du prix du riz importé et local au Bénin. Rapport final. Comité de concertation des riziculteurs du Bénin(CCR-B). Bohicon.13p.
Tossou M, Aïtchédji F (2015). Analyse de l'efficacité technique de la production du riz de bas-fond dans la commune de Savè. Mémoire de licence professionnelle. Faculté des Sciences Economiques et de Gestion (FASEG). Université de Parakou.
Mónica M J, Salazar C A (2011). Participation in organizations, technical efficient and territorial differences: a study of small wheat farmers in Chile. Chilean Journal of Agricultural Research 71(1):104-113. January-March.
Nguyen H D (2017). Estimation of Technical Efficiency and Its Determinants of White Maize Production in Vinh Long Province: A Stochastic Production Frontier Approach. Review of Integrative Business and Economics Research. Vol. 6. Issue 4, pp. 45-52.
ONASA (1999). Atlas de sécurité alimentaire et nutritionnel du Bénin. LARES/PILSA.
Xiaosong X, Jeffrey SR (1998). Efficiency and technical progress in traditional and modern agriculture: evidence from rice production in China. Elviers Science, Agricultural Economics. 18: 157-165.
Yebou J, Sikiratou B (2016). Analyse de l'efficacité technique de la production du soja dans la commune de Save, mémoire de licence professionnel, Faculté des Sciences Economique et de Gestion (FASEG), Université de Parakou.