



A Cross Perspective on the rice sector in the municipality of Tillabéry : strengths and weaknesses of urbaine and periurbaine agriculture

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Summary

This research work aims to contribute to the knowledge of the strengths and weaknesses of the rice sector in the municipality of Tillabéry. The study concerned the perimeters of Toula, Bossa, Neiri, Yalwani Goungou, Garyé and Finari. It was carried out after a survey which took place between October 2018 and November 2019 and which was carried out with 32 producers. The research hypotheses is to consider rice cultivation as an income-generating activity for those involved. The results of the study made it possible to make a correlation between the type of varieties, mastery of the technical route, soil quality and yield. These results showed the contribution of rice cultivation to the incomes of Tillabéry producers. They reveal the observation that this activity has costs that require State intervention in order to provide substantial aid to producers.

Keywords: culture, rice, rice cultivation, Tillabéry.

Context and rationale

The water situation in the town of Tillabéri is marked by a recurrent cycle of scarcity of rains which often plunges the population into years without fertile rainy season and drought. Thus, this recurrent and unpredictable cycle constantly causes a large-scale cereal deficit, particularly for dune crops including millet. However, the municipality of Tillabéri has considerable surface water potential, linked to the crossing of the city by the Niger River. The latter is in fact the source of water supply for the rice-growing areas that exist there. The economic context of the town and region of Tillabéri is marked as

much by the absence of income-generating services and activities as by the high cost of living. In terms of food supply, the government of Niger has put in place an economic and social development plan including a strong agricultural component called Les Nigériens Nourrissent Les Nigériens (Initiative 3N), the ambition of which is to fight against insecurity, food and malnutrition throughout the country, through various support to agricultural cooperatives and farmers. This 3N initiative implies the political will to achieve food sovereignty in a predominantly poor and rural population (A. DÉCARSI, 2012). In this context, the cultivation

of rice under irrigation or without irrigation therefore finds a central place in the potential for increasing national food production.

Introduction

The rice sector in Niger, like the other main agricultural sectors in the country, is a succession of income generating activities. These activities are carried out by operators belonging to different links in the chain. Within the rice sector, these different operators are constantly in commercial interactions. These interactions start from the plowing and development of the soil, to the presentation of the rice to the consumer's table. This sector also includes intermediary actors for the supply of inputs, transport and processing of products, and finally those involved in its sale. In the town of Tillabéri and its surroundings, rice cultivation is an ancestral tradition before modernizing and adapting to modern irrigated rice cultivation. This study aims to highlight the strengths and weaknesses of rice cultivation in the said commune. To do this, the activities of the various actors

involved in the various links in the production, processing and marketing of rice are analyzed taking into account the socio-cultural realities of the population. The study also attempts to establish a causal link between several production factors in the field, including in particular the plot yield, soil quality, control of the technical route recommended for the variety, the production environment and particularly the seasonality of production.

1. Material and method

1.1. Material

The survey took place between October 2018 and November 2019, this period corresponds to the two (2) seasons of rice production. It concerned several rice-growing areas, starting with the irrigated one in Toula. This 120 ha perimeter is located on the edge of the city, on the banks of the Niger River and serves as a source of income for 538 farmers. Then, the study focused on the non development areas of Bossa, Neiri, Yalwani Goungou, Garyé and Finari

(Figure1).

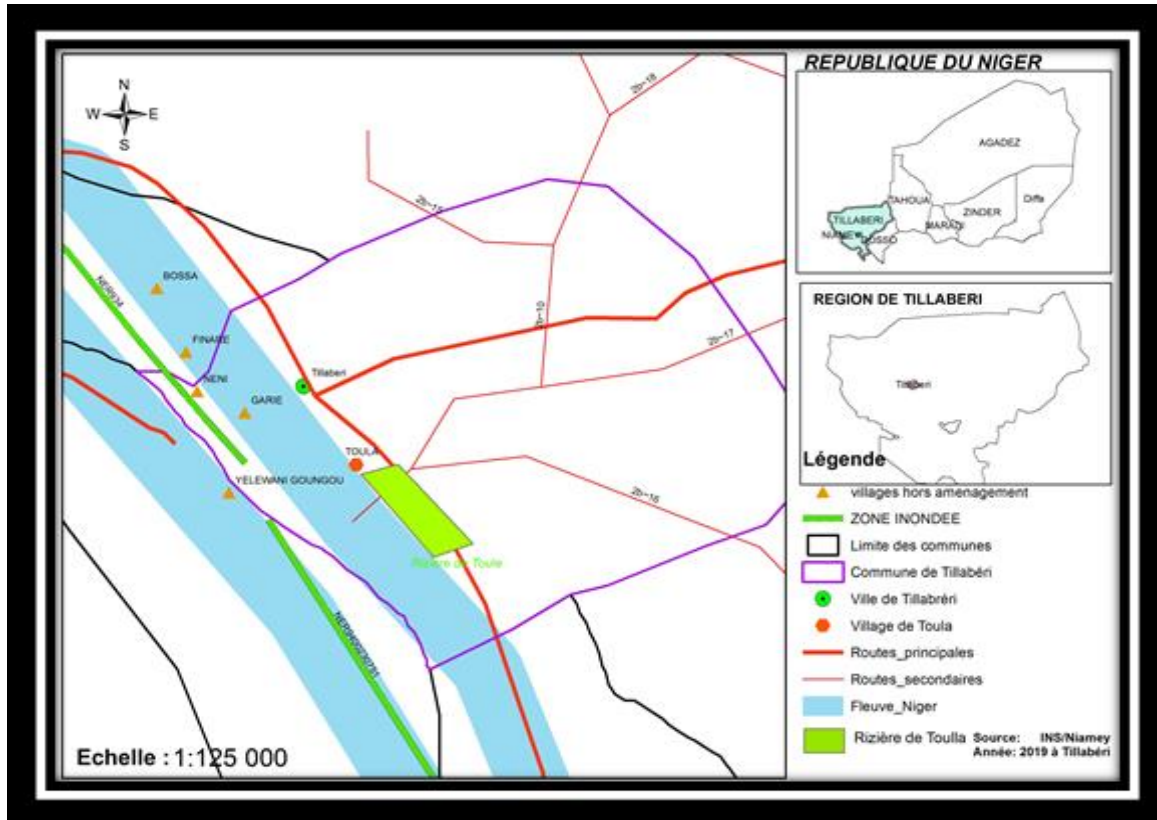


Figure1 :Map of the study area

The target population is made up of rice producers, workers, traders and consumers living in the town of Tillabéri. The agents of the Niger Rice Company (RINI), the administrators of the regional directorate of agriculture as well as the officials of the National Office for Hydro-Agricultural Development (ONAHA) are also part of this population. applies the two-tier cluster sampling method. The target area is divided into urban and periurban areas: the perimeters of Gariyé, Yalwani Goungou, Neiri and Toula correspond to the urban area and those of Bossa and Finari represent the peri-urban area. The following requirements were used as retention criteria:

1) be an operator instead of being a simple worker

2) exploit the plot during the two consecutive seasons.

Thus, on the basis of these two criteria, 32 producers residing in Toula, Daikaina and Zongo were selected to be surveyed, and the variables included in the questionnaire include the respondent's age, his social group, his level of instruction in formal or religious education, his profession if other than rice paddlers, the size of his household, his quantity of rice produced per season, his average monthly income, the area of his plot as well as the number of children in his care. In addition to the above variables, related indicators of the cost of production such as the cost of harvesting and the cost of processing were also included in the survey. Finally, the investigators also provide information on

the constraints and advantages that their subjects encounter in their rice marketing activities, then on their perceptions of the advantages and difficulties linked to rice cultivation. To take into account the peculiarities of rice cultivation outside developed areas, these producers were subjected to focus groups, in order to collect their experiences. Regarding the qualitative sample, it is also based on the reasoned choice of people likely to be interviewed. Thus, individual interviews were carried out with agents from the Regional Directorate of Agriculture, those from the RINI Company as well as those from ONAHA residing in the town of Tillabéry.

1.2. Method

The method applied to this study is both descriptive and empirical. Through the development of an analytical framework, this involves using observations and data, both quantitative and qualitative, collected using the questionnaire, individual interviews and from focus groups. This analysis is supplemented by the use of existing documents, articles and websites. An approach focused on the individual made it possible to understand the perception of the farmers on their agricultural activities, which moreover guarantee the supply of the town of Tillabéri with local rice. This approach

emphasizes methodological individualism and facilitates understanding by interpretation of the commercial interactions that take place between actors from different links in the sector. We therefore proceed by establishing causal links between the actions carried out by the various actors in the production link. Also, a purely mathematical formula was applied to the calculation of production costs. Calculation of production cost (TC): $TC = \text{labor} + \text{cost of pesticide} + \text{cost of fertilizer} + \text{cost of nursery} + \text{cost of transplanting} + \text{cost of plowing} + \text{cost of material} + \text{cost of harvesting} + \text{cost of weeding} + \text{cost of threshing} + \text{cost of irrigation} + \text{cost of transport} + \text{cost of shelling}$. 2. Results The results of the study reveal that the irrigated perimeters are operated mainly by natives of the town of Tillabéri. Indeed, even if the appetite for land leads to the commodification of land in most towns in Niger, access to rice plots remains difficult for foreigners in Tillabéri. The study also reveals that the land status varies between the donation which affects 40.6% of plots, the loan corresponding to 18.8% of plots and the purchase which concerns only 12.5% of rice plots. The heirs and the producers who received the land in the form of a pledge are respectively 12.5% and 15.6% of the surveyed population (Table 1).

Table no. 1: characteristics of producers

Group Social	Polygame	Monogame	Took Over	No.	Zongo	Purchase	Don	Readdy	Gage	Inheritate
Djerma - Songhay	3	12	10	4	1	2	5	3	3	2
Touareg	6	10	5	11		2	8	3	1	2

Kourti	1		1						1	
Total	10	22	16	15	1	4	13	6	5	4
%	31.25	68.75	50	46.87	3.13	12.5	40.6	18.8	15.6	12.5

Source : Survey, 2019

It should be noted that all the plots of the Toulouse hydro-agricultural development perimeter were offered to the first farmers by the cooperative with the assistance of the traditional chiefdom. Table 1 shows that the proportion of monogamous producers amounts to 68.75% of respondents and that of polygamists is of the order of 31.25%. Polygamy is practiced above all by the Tuaregs, whose share reaches 60%. The producers are Songhay-Djerma, Touareg and Kourtey distributed between the city districts, namely: Daikaina, Toula and Zongo: The Touaregs living in Daikaina (73%) and the Djerma-Songhays live mainly in Toula (62, 5%) which covers half of the producers. The quantity produced by the Toula irrigated perimeter is 750

tonnes in the rainy period and 850 tonnes in the hot season (DRA / Ti, 2019) (Table 2). The yield per hectare thus amounts to 6.25 tonnes in the rainy season and 7.08 tonnes in the hot season. It should be noted that the area of Toula developed is 120 hectares operated by 538 people (DRA / Ti, 2019). The study found that 1,098 people operate the non-development areas (HA), spread over an area of 790 hectares on which 556 tonnes are produced (Table 2). We see in Table 2 that the yield area outside development is very low and does not even reach one tonne per hectare. It also emerges from this study that all producers live as a couple and polygamy remains a social reality in the city.

Table 2: characteristics of Tillabéri rice cultivation

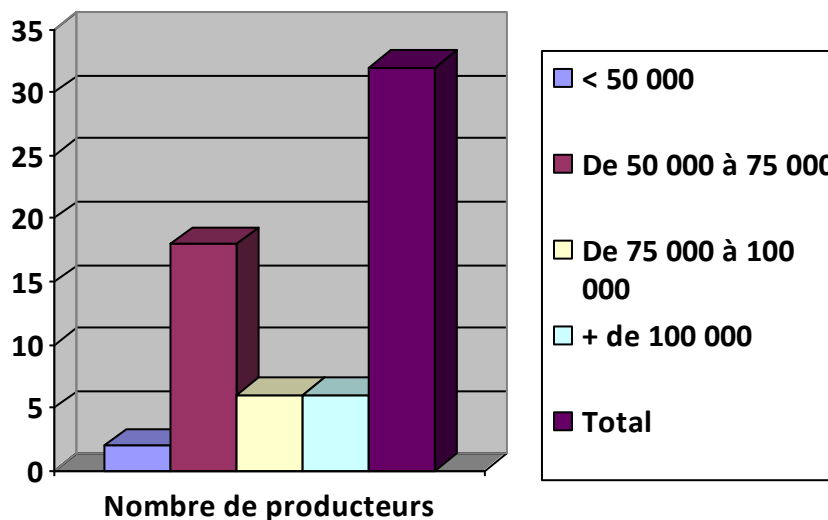
Characteristics- Ques	Took over		Bossa		Neiri		Yalwani Goungou		Garye		Finari	
	S-Hiv	S-Sec	S-Hiv	S-	S-Hiv	S-	S-Hiv	S-Sec	S-iv	S-Sc	SHiv	Ssc
Surface (ha)	120	120	190	----	100	----	150	----	250	----	100	----
Rendement (t/ha)	6,25	7,08	0.66	---	0.9	----	0.67	----	0.68	----	0.8	----
Production (t)	750	850	125	----	90	----	100	----	170	----	80	----
Exploitants	538	538	223	----	175	----	250	----	300	----	150	----

Source : Survey, 2019 S-Hiv : Winter Season, S-Sec : Dry Season

Rice is cultivated in the irrigation schemes throughout the year, spread over two production periods, namely: the rainy season and the hot season. Producers work full time and use their families as labor. But this does not save them at exorbitant costs which often exceed 100,000 FCFA (6 producers spend more than 100,000 FCFA). However, more than

half of producers, ie 17 producers, spend 50,000 to 75,000 FCFA per season. Irrigation is provided in the hydro-agricultural facilities by four (4) pumps which supply various canals which are: the main canal, the secondary canal and the tertiary canal. These pumps are operated by electricity, supplied by the Nigerian Electricity Company (NIGELEC).

Figure 1: Production Costs



With regard to non-development areas, we note that annual production is done over a single season (Table 2). We also note that the farmers come from the following villages: Finari, Yalwani Goungou, Gariyé, Neini and Bossa. These farmers buy the nursery from the Tillabéri cooperative despite the traditional and informal status of the perimeters. It should also be noted that the water drainage is done in a traditional and artisanal way. This is the reason why farmers use motor pumps to water the rice fields. These operators are mostly Wogo. Their main activities are rice growing and fishing. It should be remembered that the Wogos are a migratory people from West Africa, from

the Songhay group and established in Niger and Mali. They are settled on the edge and islands of the Niger River, a territory they share with the Zarma, Kourteys and Songhay.

The land outside development is inherited from the great-grandparents who are the first occupants. That's why, they don't pay any tax to the cooperative. It should be noted that in the winter period, the millet plots are used exclusively by women. Men, meanwhile, spend their time in the rice fields. Therefore, we can say that rice cultivation is the main activity of the Wogos. There is evidence that producers sell the rest of their crops for gasoline, food, clothes for the family. The other part of the sale is savings that will later be

used for child marriage or the purchase of built land or grain fields in the city. It should be noted that the cultivation of rice enables producers to meet their food needs. It also guarantees them significant seasonal income (Table 3).

Regarding marketing, it should be noted that the geographical location of the irrigated perimeters in relation to the city constitutes a major asset for the accessibility of rice. The perimeters are located less than 3 kilometers from the houses. Their proximity to the city therefore contributes considerably to

reducing the cost of transporting a bag of rice, which hardly exceeds 200 FCFA. Moreover, it should be noted that this marketing is carried out with two circuits, namely: the short circuit and the medium circuit. In the case of the first circuit, the rice is sold directly to consumers, at the market or sometimes, in the rice-growing areas. As for the second circuit, that is to say the medium circuit, it includes in the marketing link, intermediaries who resell the rice to local consumers. These are wholesalers and semi-wholesalers, retailers, the RINI company and restaurants in town.

Table 3: Producers' income

Revenu mensuel/FCFA	Number of producers	Percentage
50 000	21	65.6
75 000	7	21.9
100 000	3	9.4
+ de 100 000	1	3.1
Total	32	100

Source : Survey 2019

The table above allows us to say that the net monthly income realized by the producers largely exceeds the guaranteed minimum interprofessional wage (SMIG) in Niger, set at 30,047 CFA francs. This also allows us to say that the producers live above the threshold. poverty, because they earn salaries that are between 46,000 and 125,000 FCFA per month. Thus, 65.6% of producers earn 50,000 FCFA, 21.9% earn 75,000, 9.4% earn 100,000 and only 3.1% earn more than

100,000 FCFA per month. In fact, the amount of savings made depends on the family charges that producers face and on production costs. The net income achieved depends on the size of the family and the amount set aside for self-consumption. It should also be remembered that in addition to the economic contribution, the cultivation of rice plays a food role for urban producers.

3. Discussion Fertilization and soil quality contribute to increasing agricultural

productivity. Thus, the best soil texture leads to the production of large quantities. Conversely, its poor quality will inevitably lead to poor performance. This is the case with sandy plots. The results of the survey show that the larger the cultivated areas, the higher the factors of production. This makes it possible to deduce that the variation in production and labor costs follows the variation in areas. These results also show that an increase in areas generally leads to an increase in the quantities produced. This is the reason why it is therefore preferable to cultivate large areas. This logic of increasing returns to scale is the real motivation for operators of non-development areas to cultivate more large areas. As for the irrigated perimeters, the increasing returns to scale do not change the behavior of farmers, since the plots are offered by the State. Producers cultivate two varieties of rice, namely Gambiaca and IR1529. The latter are acquired at the level of farmers' organizations and at the seed farm. Thus, the Gambiaca variety is cultivated in both types of perimeters and mainly during the rainy season. It is also the most requested on the market. Its high demand is explained by its fragrant taste.

However, growing this strain requires the use of a lot of water and fertilizer. This leads to an increase in the production cost of Gambiaca compared to that of IR1529, whose nursery adapts to all types of soil (clay or sandy) and to all production seasons (rainy season and hot season). IR1529 is one of the few varieties that adapt to the excessive heat of the commune of Tillabéri. The survey by Mossi et al. (2017,), shows that in addition

to these approved varieties, other community varieties are also cultivated in the plots of Toula and Bonfeba. Rice cultivation is faced with a series of difficulties, including the lack of financial resources for producers, the mismatch between varieties and seasons, low demand for local rice on the market, and the abandonment of sub-production sector by the State, the lack of mastery of the technical route, etc. The latter is a handicap to the cultivation of rice in the city. These results are similar to those obtained by Mossi et al (2017) who reveal that the technical itinerary of the producers of Toula and Bonféba constitutes a real obstacle for the development of rice cultivation. These two studies also have similar results, namely that the wrong choice of varieties, the lack of control over the establishment of nurseries and the absence of rice transplanting techniques considerably reduce the yield of the perimeters. Added to this is the low financial means of producers which also leads to a sharp decrease in yields and productivity of the schemes, especially when it comes to the IR1529 variety. The results of the study indicate that the cultivation of this variety (IR1529) requires the use of fertilizers to increase the yield. Indeed, producers who have been investigated complain about the lack of state aid. According to them, the state does not provide them with regular and substantial financial support, allowing them to improve seasonal production. These results also highlight the observation that producers are people who have no other opportunity. The most crucial problem they face is the difficulty of accessing bank loans, even if NGOs and microfinance come to them.

sometimes help. Thus, out of the 32 producers who were investigated, 22 say they have received a loan either from microfinance or from an NGO, 9 producers say they have never received credit. and 1 producer did not respond. This shows that our results are different from those obtained by AMIR Sido (2011) which show that rice producers at the national level do not have access to loans (bank loans, fertilizer loans, etc.). It should also be remembered that our results are contrary to those resulting from a study conducted jointly by the State of Niger and the World Bank in 2009 on the diagnosis and strategic options for the development of irrigation conducted by Obiageli Katryn Esekwesili et al (2009). Indeed, it emerges from this study that the AHAs are designed, owned and financed by the State of Niger. However, this study is similar to ours in that it finds in irrigated agriculture a significant contribution to the Nigerien economy as a whole. Because, the results of our study showed the important contribution of rice cultivation in household income. It should be noted that the water problem and the levy to which the farmers are subjected constitute other burdens for the cultivation of rice. This brings our results closer to those obtained by Alizée Ehrnroot et al. (2011) for whom, the fee covers all current expenses made during the campaign by the cooperative for all farmers as well as fixed costs. The royalty is therefore not imposed in proportion to the quantity harvested, but rather depends on the area individually cultivated. It should be noted that, despite these burdens imposed on producers, not all have access to sufficient water throughout the growing season. Because

the pumps that supply the plots are often confronted with fuel or mechanical breakdowns due to the lack of spare parts. Another constraint facing rice cultivation is the importation of Asian rice which exposes local rice to a drop in demand on the market. According to the interviewee, the preference of foreign rice over local production is linked to the processing conditions, that is to say the lack of hygiene on the side of local rice (presence of stones in the rice). Finally, non-development areas are faced with the problem linked to the presence of hippos in the islands which also creates a problem of cohabitation through interactions between animals and producers. From a food point of view, growing rice contributes significantly to the fight against food insecurity and malnutrition among children. Thus, the rice is transformed into porridge, flour or pancake. The porridge is consumed by young children and nursing mothers. It is also fortified with local foods to feed malnourished children (H. Djibo et al 2019). Because the enriched porridge helps fight against malnutrition. As for rice cakes, they are sold on the boulevards of the city and in the market. The social construction of the common sense of the donation of cake reinforces belief and custom. Because, to give a cake is also to get closer to god (alms). This is the reason why her demand is high on Friday, which is considered charity day. Indeed, apart from the spiritual sense, the cake is also consumed in the morning and in the evening by all social layers. As for the rice flour, it is prepared in the evening as a family dish.

Conclusion

The conclusion drawn from this study consists in saying that the geographical location of the perimeters in relation to the city, the income generated per season, the quantities produced and the yield of the cultivated varieties constitute considerable assets which open up promising prospects for the development of the rice cultivation. However, rice cultivation is faced with problems such as the lack of financial means of producers, the mismatch between varieties and seasons, low demand for local rice on the market, abandonment of the sub-sector by the State. and the lack of mastery of the technical route.

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