RESEARCH ARTICLE

SOCIO-ECONOMIC CHARACTERISTICS OF AGRICULTURAL HOUSEHOLDS ALONG THE TELWA VALLEY IN AGADEZ REGION, NIGER

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ABSTRACT

The agricultural sector occupies a preponderant place in the Nigerien economy. It is dominated by the presence of agricultural operations which carry out several activities. The latter make it possible to guarantee market gardening production by households living along the Telwa valley in the Agadez region of Niger. The socio-economic activities of agricultural households are carried out throughout the year; they are based on market gardening which allows them to earn substantial income. The objective of the study aims to characterize, analyze socio-economic activities and highlight the natural resources available to agricultural households along the Telwa valley. Data was collected using questionnaires and a focus group of 8 to 10 people per village (16 villages) from a sample of 400 agricultural households living along this valley. The analysis of the characteristics of agricultural households was carried out using an ascending hierarchical classification, a principal component analysis and the independence test and made it possible to identify 5 groups of economic activities whose activities of group 1 (49. 25%), the activities of group 2 (41. 50%), the activities of group 3 (8%), the activities of group 4 (1%) and the activities of group 5 in a strong minority with0. 25%.

INTRODUCTION

The study area is mainly made up of three (3) municipalities, namely Agadez, Dabaga and Tchirozérine, all located in the Tchirozérine Department. The latter is located in the southwestern part of the country, between 15° 18' and 19° 36' north latitude and 4° 19' and 11° 00' east longitude. It is located mainly in the Tchirozérine Department, Agadez region, Niger, with an area of 154,746 km², or 23% of the territorial area of the Agadez region and 12% of the national territorial area (Urban Commune of Tchirozerine, 2012). The department of Tchirozerine is limited to the north by the department of Arlit and the Republic of Algeria, to the south by the departments of Dakoro and Tanout, to the east by the department of Bilma and Gouré and to the west by the Departmentof Tchintabaraden and the Republic of Mali, It includes six (6) municipalities: Agadez, Tchirozérine, Tabelot, Dabaga, Aderbissanat and Ingall, the main centers of human concentration of which are Agadez, Tchirozérine, Ingall, Aderbissanat and Tabelot Figure 1 (Chaibou, 2022).

MATERIALS AND METHODS

The materials used to carry out this study are computer tools for data entry and collection of data in the field using a tablet equipped with the Kobo collection application and Kobotoolbox for the development of survey sheets. The processing and analysis was done by the Q Gis and Arc Gis software for the cartographic representation and location of the study area. The entry is made on the Microsoft Excel spreadsheet for structuring the data collected in the field. Then for the analysis of qualitative and quantitative data, a combination of software such as Sphinx, Past version 3. 16, R and R Studio, and Minitab version 14 and 18 were used. Also, there was the use of the Global Positioning System (GPS) for the geographical location of the different localities concerned by the study area. The study adopted an approach methodology called: Accelerated Participatory Research Method (APRM) consisting of collecting information on socio-economic activities (agriculture, livestock, gathering, trade, agricultural practice, income, activities linked to natural resources or others) of agricultural households from the various riverside villages located near the Telwa valley while involving the population and their leaders in the preparation and carrying out of this study. The survey method was based on an individual questionnaire system considered as a basic tool for collecting information, as well as the method of Pierre Dagnelie (1973) for the application of collected information (Dagnelie). Data was collected using questionnaires and a focus group of 8 to 10 people per village (16 villages) from a sample of 400 agricultural households living along this valley.
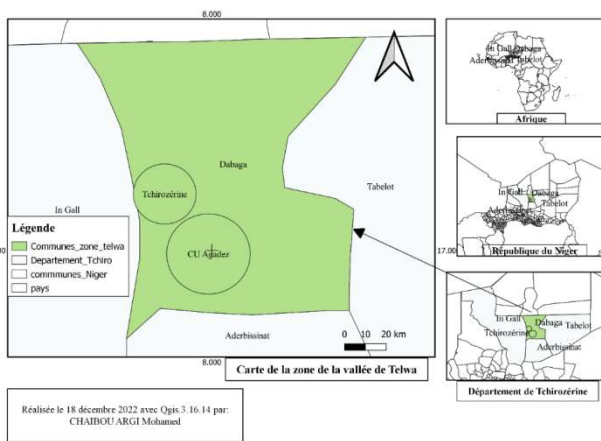
Figure 1. Map showing the geographical location of the Telwa Valley area

RESULTS

Recognizing family farms as partners means first of all understanding their practices and their objectives, then their organizational and operating dynamics, and finally associating them in the definition of development strategies. Consequently, it is urgent to revisit and update the knowledge base on family farms which present a great diversity from the point of view of socio-economic characteristics, mode of organization and operation, etc., depending on the agro-ecological areas (Guèye, 2008). The typology of farms highlights the socio-economic characteristics of these farms which can be developed on the basis of a certain number of variables grouped into blocks (farm household, production factors, production system, and output). Each of these variables used as references in the categorization of agricultural operations is a factor in their differentiation. Thus in the agricultural household block, we have: the size of the household, the age of the head of the farm, the number of years of experience in agricultural production, the gender of the head of the farm or household, the main activity of the farm manager and the level of education of the farm manager. At the level of the "factors of production" block, we have the total area of fields of the head of agricultural operation, the mode of access to land, the number of agricultural assets, access to agricultural credit, use chemical inputs, the use of motorized traction or animal traction, the use of salaried, casual or family labor, the practice of irrigation and the cattle population (Sossou, 2021). Most of these variables were taken into account in this present study and were the subject of analysis. Belonging distinction of groups one or the other, was determined by the quantity of production, self-consumed quantity of production, number of livestock or livestock, the self-consumed quantity of livestock, the sold quantity of livestock, the priceunit of livestock, the duration of activity, the area of land exploited, the average annual income and expenses…etc.

DISCUSSION

Also, agricultural households who live along this valley have significant forest and water resources. The latter offer households several services that contribute to the socio-economic and cultural development of populations. This study will enable decision-makers and development partners to encourage scientific and applied research for sustainable development for the benefit of the most disadvantaged rural populations. Group 1 (G1) is characterized by the economic activities of households with a good average sheep herd (1. 39 to 1. 93 TLU), this group of activities of agricultural households represents 49. 25% of the activities of the households surveyed they sold a large quantity of livestock (0. 89 ± 0. 77 TLU) with a good unit sales price (47,785. 71 ± 6,843. 71 F CFA). This category of activities produced an average quantity of market gardening production (4,653. 55 ± 3,132. 18 kg) on average areas of exploited land (1. 22 ± 0. 81 ha) with an average annual income of 1,344847. 71 ± 941,006. 96 CFA

francs. They carry out their activities for an average duration of 6. 77 ± 2. 72 months and have also consumed an average quantity of their market gardening production (83. 50 ± 42. 19 kg) as well as that of their livestock (0. 49 to 1. 12 UBT) and make good spending (645,609. 13 ± 280,438. 58 F CFA). This group of activities occupied first place in terms of self-consumed quantity of livestock and the unit sales price of livestock. These were the activities carried out bilaterally by agricultural households with market gardening, these include among others: market gardening-livestock which occupied the majority of the activities of households in this group, it is domestic breeding or in the gardens then followed market gardening-breeding-processing, market gardening-breeding-picking or crafts, market gardening-exodus, market gardening-transport, market gardening-craft and market gardening-breeding-commerce. It is a group of socio-economic activities made up of households which depended only on family farm market gardening on domestic livestock and commercial activities. This group of agricultural household activities occupied the first position. Group 2 (G2) represented 41. 50% of the households surveyed. Indeed it was an activity group of the largest market gardeners in the Telwa valley characterized by good market garden production (4,993. 97 ± 3,788. 13 Kg), a good average self-consumed quantity of market garden production (87. 50 ± 39. 67 Kg) and average self-consumed quantity of livestock (0. 10 to 0. 12 TLU). In their activities, this group made average expenses (553,584. 33 ± 217,457. 65 F CFA) and had the highest average annual income of 1,366536. 14 ± 761,773. 18 F CFA. This activity group had a good average herd (1. 73 to 1. 92 TLU) with an average quantity sold of 0. 22 to 0. 29 TLU and a good average unit price (40,933. 73 ± 17,395. 62 F CFA). The activities of this group have a good duration (6. 77 ± 2. 72 months) of activities and a small area of exploited land (1. 06 ± 0. 52 ha). It was in second position in terms of the average quantity of market gardening production, and average annual income. Then they occupied third position in terms of self-consumed quantity of production, sheep herd, and the unit sales price of this livestock, the quantity sold and self-consumed of this herd, expenses as well as duration of activity. This is the group whose main activity was market gardening; this is accompanied at the same time by extra market gardening activities practiced by households, namely breeding, trade and mechanics. These activities are market gardening-breeding, market gardening-commerce and market gardening-mechanical trade.

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Activity group 4 (G4) represented 1. 00% of agricultural household activities in the valley and had a good area of exploited land (1. 66 ± 0. 57 ha). They have few livestock 0. 13 to 0. 23 TLU and sell almost all of their livestock (0. 13 to 0. 23 TLU) with an average unit sales price (28,867. 51 ± 16,666. 66 FCFA) of which he did not consume any head of their livestock. The activities of this group had low production (2,000. 00 ± 866. 02 Kg), often even affected by losses due to flooding, a low average annual income (536,666. 66 ± 126,622. 79 F CFA). and spend little (216,666. 66 ± 125,830. 57 F CFA). This activity group has a short duration of activity of 6 months and occupied the second position in terms of surface area of exploited land and the third position in terms of unit sales price. The main activity of this group is market gardening with breeding and trade as secondary activities and transport and picking as tertiary activities, these are mainly market gardening-breeding-transport and market gardening-trade-picking. This group occupied the fourth group of agricultural household activities in the valley. Group 5 (G5) had 0. 25% of agricultural household activities in this area, of which it is made up of a single household activity. This group had first place in terms of duration of activity (12 months) and self-consumed quantity of vegetable production (100 kg). They have little production 4,000 kg and that of average annual income (1,000,000 F CFA) and expenses (1,000,000 F CFA). Then this household group did not breed livestock and did not have any livestock. Market gardening was their main activity and masonry as a secondary activity. This activity

group mainly consisted of market gardening and masonry. It ranked fifth in the agricultural household activity groups. To present the distribution of the different activities of the agricultural household along this valley, a projection of the contribution of economic variables combined with that of the distribution of the different groups of activities along the axes was carried out. This distribution was represented as a double projection of economic activity variables according to the different groups of activities distributed along the discriminating axes (Figure 2).
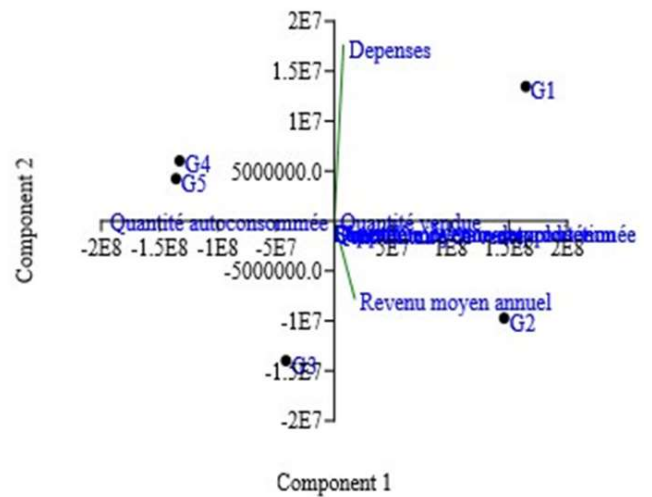

Figure 2. Double projection diagram of variables according to the different groups of household economic activities

Cluster analysis by ascending hierarchical classification: After the analysis of the matrix, a cluster analysis by the ascending hierarchical classification of the different activities of agricultural households was carried out; the latter was structured and standardized according to a numerical order of similarity of economic activities. These activities were then confirmed and represented on a cluster dendrogram according to the contribution of the different economic variables (Figure 3).
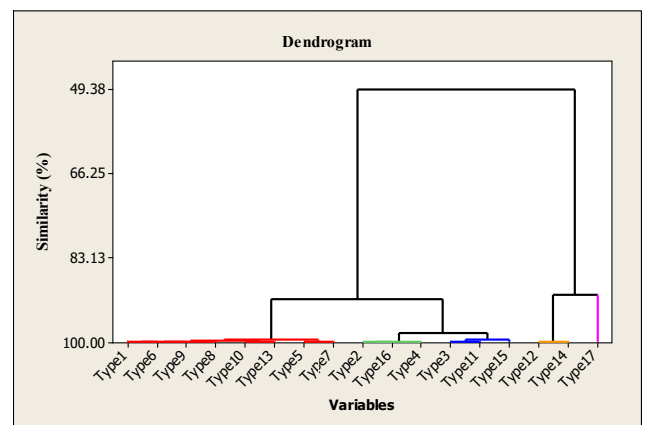

Figure 3. Dendrogram of economic activities of agricultural households along the Telwa valley

After the analysis of the numerical classification of household economic activities, the results of these activities were used, of which an ANOVA test (Krustal-Wallis test) was carried out to compare the means of different groups according to the variables in order tocheck the potential of the characteristics of these activities. The test thus carried out (Krustal Wallis) made it possible to obtain the result of the main groups of economic activities of agricultural households along the Telwa valley with a P-Value for each which was less than 0. 0001, i. e. that is to say the difference between the different means of agricultural household activity groups was significant (see table below).

Table. Main socio-economic characteristics of agricultural households along the Telwa Valley

Caractéristics	Group 1 (49,25%)	Group 2 (41,50)	Group 3 (8%)	Groupe 4 (1%)	Group 5 (0,25%)	P-Value
APQ (Kg)	4653,55±3132,18[c]	4993,97±3788,13[b]	6257,8125±5465,61[a]	2000,00±866,02[e]	4000,00±0,00[d]	<0,0001
AAI (FCFA)	1344847,71±941006,96[c]	1366536,14±761773,18[b]	5496875±2615432,71[a]	536666,66±126622,79[e]	1000000,00±0,00[d]	<0,0001
EXPENSES (F CFA)	645609,13±280438,58[b]	553584,33±217457,65[c]	1047968,75±103424,11[a]	216666,66±125830,57[d]	100000,00±0,00[a]	<0,0001
SCPQ(Kg)	83,50±42,19[d]	87,50±39,67[c]	98,4375±44,87[b]	50,00±0,00e	100,0±0,00[a]	<0,0001
LIVESTOCK (UBT)	1,93 ± 1,39[b]	1,03 ± 0,84[c]	5,38 ± 1,86[a]	0,23 ± 0,13[d]	0,00±0,00[e]	<0,0001
SQLT (UBT)	1,12 ± 0,49[b]	0,12 ± 0,10[c]	1,69 ± 0,4[a]	0,00 ± 0,00[d]	0,00±0,00[d]	<0,0001
QSL (UBT)	0,89 ± 0,77[b]	0,29 ± 0,22[c]	1,11 ± 0,31[a]	0,23 ± 0,13[d]	0,00±0,00[e]	<0,0001
LUP: (F CFA)	47785,71±6843,79[a]	40933,73±17395,62[b]	25781,25±24987,39[d]	28867,51±16666,66[c]	0,00±0,00[e]	<0,0001
DURATION (Month)	6,77±2,72[c]	6,77±2,72[c]	11,15625±1,37[b]	6,00±0,00[d]	12,00±0,00[a]	<0,0001
AEL: (ha)	1,22±0,81[c]	1,06±0,52[d]	2,796875±0,78[a]	1,66±0,57[b]	0,70±0,00[e]	<0,0001
UBT : Tropical Livestock Unit, < 0.0001: significant difference Means followed by the same letter on the same line are not strictly different.						

APQ: Avaerage Production Quantity; AAI: Average Annual Income; SCPQ: Self-consumed Production Quantity; Livestock: number of livestock; SQLT: Self-Consumed Quantity of Livestock; QSL: Quantity Sold of Livestock; LUP: Livestock Unit Price; AEL: Area of Exploited Land.

CONCLUSION

The study on the characterization of agricultural households living along the Telwa valley made it possible to characterize five groups. The latter are distinguished based on the dominant variables analyzed. Thus, the first group is characterized by the economic activities of households with a good average sheep herd (1. 39 to 1. 93 TLU), this group of activities of agricultural households represents 49. 25% of the activities of the households surveyed. The second group presents the activity of the largest market gardens in the Telwa valley, it is characterized by good market garden production, a good average self-consumed quantity of market garden production and average self-consumed quantity of livestock. In their activities this group made average expenses and had the most average annual income.

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