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Agricultural activities of Zarma ethnic group in Dosso district area of Niger Republic

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Abstract

The study assesses the agricultural activities of Zarma ethnic group in Dosso district area in Niger Republic. One hundred and twenty farmers comprising of both males and females were interviewed in line with the objective of the study. Descriptive statistics and inferential statistical tools were used for data analysis. The findings indicated that 88.3%, 64.2% and 55.0% of the respondents indicated encountering severe problems of accessibility to fertilizer, poor climatic conditions and lack of feed and drugs for their animals. The findings also revealed that 65.8% of the respondents adopted coping strategies of selling of processed food crops to earn income while a large percentage (43.3%) engage in both livestock and food crop trading. Inferential statistics shows that there is a significant relationship between gender and the coping strategies adapted by the respondents since p-value for gender ($X^2 = 5.821$; $P \leq 0.05$) is equal to 0.05 significant level. This implies that both males and females are looking for other means to supplement food for their households in the study area. The findings further revealed that age ($r = 0.414$, $p = 0.000$), and household size ($r = 0.567$, $P = 0.000$) are significantly related to agricultural activities, and the chi-square test showed that gender ($x^2 = 30.863$, $P = 0.000$) has significant relationship with cropping activities in the study area. It is recommended that agricultural extension services should be intensified to transfer relevant and better farming techniques to the study area in order to boost their agricultural activities.

Keywords: agriculture, activities, production, coping strategies, constraints.

1. Introduction

Agriculture is the main source of food supply and basic necessities of life of majority of people in the world. The agricultural sector plays a key role in the Economic Community of West African States (ECOWAS). It is the backbone of the national economy and people's jobs, incomes and food security depend upon it. In economic terms, this sector accounts for up to 35% of the region's Gross Domestic Product (GDP) and also employs majority of the labor force in the region [10].

Agriculture is the overall main source of livelihood and income for Nigeriens. The majority of Niger's populations are rural residents engaged in subsistence agriculture and stock- rearing which contribute approximately 40% of the GDP, the agricultural products exported include livestock products, cowpeas, onions and cotton and nearly three quarters of the labor force is employed in this sector [8]. The leading crops produced are millet, sorghum, cassava, cowpea, peanut, rice cotton and onions. Poultry, goats, cattle, sheep and camels are raised [14; 8].

The region of Dosso located in southwest Niger, accounts for 14 percent of the total population of Niger [4]. The climate is mainly the Sahelo-Sudanian type, with annual rainfall average of between 400 and 900 mm. Soils are mainly sandy in two-thirds of the region, with clay soils in less than 10 percent of the region. Zarma, Maouri, and Peulh are the main ethnic groups. In this region, the main rain fed crops grown are millet, sorghum, cowpea, peanut, and bambara nuts. Irrigated crops such as rice, vegetables, and fruit trees are grown in the river valley and floodplains. Major crop associations include millet–cowpea, followed by millet–sorghum–cowpea, millet–sorghum, and millet–cowpea–sesame [9].

The workforce of the Zarma ethnic group that represents over 2 million people or 22% of the total population cannot be under estimated both in agricultural and development activities. They are traditionally farmers and fishermen, they live in the southwestern part of the country along the Niger River

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and because Niamey, the capital, is in their homeland, the Djerma constitute the majority with of over 350,000 inhabitants, those living in the rural areas close to the capital in the Southwest of the country constitute a very significant portion and practice crop activities and raise animals mainly as farmers on small scale [2].

Although the economy of Niger is mainly based on agriculture and cattle breeding, there is poverty in Niger Republic due to the subsistence farming nature of its people that cultivate on poor soils that are not suitable for crop production, covered by sand dunes and are sensitive to water and wind erosion. The farming system is characterized by a dominance of small holding farm households, lack of capital investment, and utilizes traditional technology of production that involve the use crude implements such as hoe, cutlass, machetes and sickles [14]. These farmers operate under poor productivity, hence, there is need to look at the kind of agricultural activities they are engage in so as to know how they contribute to the well being of their families. It is in view of this the following research objective was raised to investigate the agricultural activities of Zarma ethnic group in Dosso district area in Niger Republic. The specific objectives are to determine the personal characteristics (age. Gender, educational status marital status) of Zarma ethnic group; identify the agricultural activities of Zarma ethnic group; examine the attitude of the respondents towards agricultural activities; identify the constraints faced by Zarma ethnic group; and the relationship between some socio-economic characteristics and coping strategies behavior adopted by the respondents to earn a living in the study area.

2. Methodology

The study was conducted in Dosso district area in Niger Republic. The district area is comprised of all the villages around Dosso town, with more than 150 villages in number. The district area of Dosso lies between longitude 13.050^{o} N and 3.20^{o} E and latitude 13^{o} 03^{1}N and $3^{o}12^{1}$E. According to the 2001 population census the districts area has a total population of 309,210 (National Institute of Statistics of Niger Republic). The study area has a Sudan Savannah type of vegetation, the annual rainfall of the country in general is relatively low ranging from 350 to 800mm on a north-south transect which poses serious challenges for production of sufficient food and rearing of livestock, the average high temperature is 36^{o}c and the average low temperature is 22^{o}c. The rainy season starts in May and ends in September and naturally proceeded by dry season (Ben Mohamed,Van Duivenbooden and Abdoussallam, 2002)[3]. The major occupation of the people is agriculture and trading. The district area is a heterogeneous society dominated by Zarma ethnic group; speaking Zarma language, others include Fulani, Tuarez and Hausa.

For this study simple random sampling technique was used to select ten villages from the district for the study, 12 respondents comprising of six (6) males and six(6) females were further randomly selected from each village to make a total of 120 respondents (60 males and 60 females) for the study. A well structured interview schedule comprising of open and close questions was used as a primary source of data collection from the sampled respondents. Data analysis was done using descriptive statistics such as frequency distribution and percentages to determine the agricultural activities of the respondents, 5 point Likert rating scale of Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (DS) were used to analyze respondents' attitudes towards agricultural activities in the study area. PPMC and Chi-square were used to test the formulated hypotheses of the study.

3. Results and Discussion

Age is an important factor that influences the agricultural activities of farmers as it determines the effectiveness and competence of labour availability for production. As indicated in Table 1, most of the Zarma ethnic farmers are between 25-39 years (42.5%). This means that, the farmers are in their active age, have the ability to supply the require labor in agricultural activities to boost production and if adequate input is supplied to them, their agricultural productivity rate can be improved [1] ;[12]. The result in the Table shows that both male (50%) and female (50%) of Zarma ethnic farmers have equal participation in farming activities, this indicates that women are also highly involved in agricultural development and accept more responsibilities for household welfare and food security [7]. The Table also indicates that majority (95%) are practicing Islamic religion, most of the Zarma ethnic farmers attended Quranic education (36.6%) and 29.2% of the Zarma ethnic farmers have no formal education, this means that they lack technical know-how in handling agricultural inputs and ability to interpret information given on new innovation. Ability to interpret effective communication passed from researchers through

extensionists to farmers is vital in the modification of farm management practices to be suited to local ecological conditions [13].

Table1. Socio – economic characteristics of respondents in the study area (n =120)

Age	Frequency	Percentage
25 – 39	51	42.5
40 – 45	38	31.6
55 – 69	30	24.1
> 70	1	0.8
Total	120	100
Gender	Frequency	Percentage
Male	60	50
Female	60	50
Total	120	100
Marital	Frequency	Percentage
Married	104	86.6
Single	7	5.8
Divorced	3	2.5
Widow	6	5
Total	120	100
Religion	Frequency	Percentage
Islam	114	95
Traditional	5.0	4.2
Christianity	1	0.8
Total	120	100
Educational Status	Frequency	Percentage
Quaranic Education	44	36.6
No formal education	35	29.2
Primary education	27	22.5
Secondary education	11	9.2
Adult education	3	2.5
Total	120	100
Household Size	Frequency	Percentage
1 – 10	86	71.5
11 – 20	31	26.0
> 20	3	2.5
Total	120	100

The Table further shows that majority (71.5%) of the Zarma ethnic farmers have household size of between1-10 people, households with large family size of productive youths are likely to have advantage of high labor supply in agricultural production.

The Table 2 shows that the Zarma ethnic farmers engaged in crop production, 85.8% of the farmers are regularly engaged in groundnut production and it is the crop that has the highest level of production. Other major crops regularly produced in the study area include black eye beans (60.8%) and millet (53.3%). This means that groundnut, black eye beans and millet are their major crops produced in the study area. The highest level of production of these crops in the study area may partly be due to high level of tolerance of these crops to drought, high temperature, required less rainfall and sandy nature of the soil. From the Table, among the crops occasionally produced by the respondents in the study area include maize (40.8%), black eye beans (29.2%), sorghum (23.4%) and groundnut (14.2%). The Table further revealed that sugarcane is not being grown at all as 0% was recorded for regular growers, 3% was recorded for occasional growers while majority (97.5%) of respondents do not grow it at all. Other crops that are mostly not grown by the respondents in the study area include potatoes (99.2%), mangoes (86.7%), maize (58.3%) and sorghum (48.3%). The implication of not frequently engaged in the production of these crops can be associated to the high demand of such crops to nutrients and rainfall which are inadequate in the study area which lead to low output or crop failure.

Table 2. Distribution of Zarma Ethnic Farmers according to Food Crop production (n =120)

Food Crops Produced	Regularly		Occasionally		Not at all	
	Freq.	Per.*	Freq.	Per.*	Freq.	Per.*
Millet	64	53.3	5	4.2	51	42.5
Sorghum	34	28.3	28	23.4	58	48.3
Groundnut	103	85.8	17	14.2	0	0
Black eye beans	73	60.8	35	29.2	12	10.0
Maize	1	.8	49	40.8	70	58.3
Potatoes	1	.8	0	0	119	99.2
Sugar cane	0	0	3	2.5	117	97.5
Mangoes	16	13.3	0	0	104	86.7
Others	61	50.8	35	29.2	24	20.0

Source: Field survey, 2012. *The percentage added to more than 100% due to multiple responses.

The result in Table 3 shows that majority of the respondents regularly involved livestock rearing. The major livestock reared in the study area include poultry (74.2%), goat (59.2%) followed by sheep and cattle scoring 39.2% and 35.0% respectively. The Table also revealed that only 14.2%, 25.0%, 35.8% and 19.1% of the respondents are occasionally engage in poultry, goat, sheep and cattle rearing respectively. The result in the Table further revealed that camel is the least reared animal with 0% for regular rearers, 2.5% for

occasional rearers and 97.5% do not rear it at all. The low or occasional involvement of the respondents in the rearing of heavy animals (camel and cattle) may be explained by harsh climatic conditions that sometimes results to drought in the country which makes adequate green pasture unavailable for feeding.

The result in Table 4 indicated that greater percentage (88.3%, 64.2% and 55.0%) of the respondents respectively indicated encountering severe problems of accessibility to fertilizer, poor climatic conditions and lack of feed and drugs for their animals. Other severe problem reported in the study area is lack of pesticides (44.2%). This is implies that inputs such as fertilizer, pesticides, supplementary feed for animals and drugs are seriously lacking in the study area, hence, the need for intervention in the supply of these inputs to boost the agricultural activities in the study area. The Table also shows that majority (86.7%, 69.2% and 67.5%) of the respondents respectively indicated having moderate problem of extension service delivery, absence of credit facilities and lack of infrastructural facilities in the study area. The Table further revealed that, majority (75.8%) and slightly above half (54.2%) of the respondents respectively indicated lack of labor and access to land is not a constrained to them in the study area.

Table 3. Distribution of Zarma Ethnic Farmers According to Livestock Production (n =120)

Livestock	Regularly		Occasionally		Not at all	
	Freq.	Per.*	Freq.	Per.*	Freq.	Per.*
Cattle	42	35.0	23	19.1	55	45.8
Sheep	47	39.2	43	35.8	30	25.0
Goat	71	59.2	30	25.0	19	15.8
Poultry	89	74.2	17	14.2	14	11.6
Camel	0	0	3	2.5	117	97.5
Others	4	3.3	0	0	116	96.7

Source: Field survey, 2012. *The percentage added to more than 100% due to multiple responses.

Table 4. Distribution of Zarma Ethnic Farmers according to the constraints encountered in crop and livestock production (n =120)

Constraints to crop production	Severe		Moderate		Not constrained	
	Freq.	Per.*	Freq.	Per.*	Freq.	Per. *
Not accessible to fertilizer	106	88.3	-	-	14	11.7
Lack of pesticide/insecticide	53	44.2	34	28.3	33	27.5
Lack of credit facility	33	27.5	83	69.2	4	3.3
Lack of basic infrastructure	25	20.8	81	67.5	14	11.7
Lack of extension services	13	10.8	104	86.7	3	2.5
Lack of labour	8	6.7	21	17.5	91	75.8
Lack of access to land	6	5.0	49	40.8	65	54.2
Poor climatic condition	77	64.2	41	34.2	2	1.7
Lack of feed and drugs	66	55.0	42	35.0	12	10.0

Source: Field survey, 2012. *The percentage added to more than 100% due to multiple responses.

From the result in Table 5, 1.7% and 56.7% of the Zarma ethnic farmers shows a positive response towards getting enough from agricultural activities in the study area, while only 24.2% disagreed with this statement. The Table also revealed that 20% and majority (56.7%) of the respondents agreed that the constraints to agricultural activities could be overcome. The Table further revealed that 35.8% and more than half (55.8%) of the respondents respectively agreed that government is not encouraging agriculture compare to other sectors. The Table also depicts that 36.7% and 52.5% of the Zarma ethnic farmers disagree respectively that they have a fertile land. The result in the Table shows that, close to half (40.0%) and (46.7%) of the Zarma ethnic farmers respectively disagreed that extension agents are visiting them, this implies that the transfer of improved agricultural technology in the study area is very poor. The Table also revealed that 15% and 80% of the respondents agreed that the agricultural activities are benefiting them. The Table finally revealed that 34.2% and 61.7% of the respondents disagreed that government is contributing to agricultural development in their area. This implies that the contribution of Niger government to the study area in terms of input supply and relevant information

that will boost the production capacity in the study area is poor or inadequate. Any efforts geared towards facilitation and modification of existing farm practices will enhance their social acceptability, motivate farmers' interest in taking farming as a profitable and lucrative business [11].

Households adopt and develop diversified coping strategies according to their different poverty level as a response through which people use at the time of decline in food availability, to meet their needs and adjust to future disaster [6]. The result in Table 6 shows the different coping strategies adapted by the respondents to supplement food supply in their households in the study area. The Table indicates that 65.8% of the Zarma ethnic farmers engage in selling of processed food crops to earn income, a large percentage (43.3%) engage in livestock trading and food crop, while a few minority engage themselves in teaching Arabic (2.5%) and herbalist practice (1.7%).

Table 5. Distribution of respondents according to attitudes towards agricultural activities in the study area (n =120)

Attitudinal Statements	*S.A		*A		*U		*S.D		*D	
	Freq	Perc.	Freq	Perc.	Freq	Perc.	Freq.	Perc.	Freq.	Perc.
Getting enough from agricultural form agricultural activities	2	1.7	68	56.7	17	14.2	30	25	3	2.5
The constraints to agricultural activities could be overcome	24	20.0	68	56.7	28	23.3	-	-	-	-
Government is not encouraging Agriculture compare to other sectors	43	35.8	67	55.8	5	4.2	4	3.3	-	-
Have a fertile lands	1	0.8	1	0.8	10	8.3	44	36.7	63	52.5
Extension Agents are visiting them	1	0.8	13	10.9	1	o.8	56	46.7	48	40.0
The agricultural Activities are benefiting them	18	15.0	96	80.0	3	2.5	-	-	1	0.8
Government is contributing to agriculture in their area	-	-	1	0.8	2	1.7	41	34.2	74	61.7

Source: Field survey, 2012; *S.A.: Strongly agreed; *A: Agreed; *U: Undecided; *D: Disagreed; *SD: Strongly disagreed.

Table 6. Distribution of respondents according to coping strategies adapted to supplement agricultural activities in the study area (n =120)

Coping Strategies	Engage in		Not engaged in	
	Freq.	*Per.	Freq.	*Per.
Selling of processed food crops	78	65.8	41	34.2
Trading livestock and food crop	52	43.3	68	56.7
Teaching Arabic	3	2.5	117	97.5
Herbalist	2	1.7	118	98.3

Source: Field survey, 2012. *The percentage added to more than 100% due to multiple responses.

Testing of the hypothesis

H_1: There is no significant relationship between some selected demographic characteristics (gender, religion and marital status) and coping strategies adapted by Zarma ethnic farmers.

H_2: There is no significant relationship between socio-economic characteristics (Age, household size, gender, marital status and religion) with agricultural activities of the Zarma ethnic farmers.

The result in Table 7 shows that there is a significant relationship between gender and the coping strategies adapted by Zarma ethnic farmers, since p-value for gender (X^2 = 5.821; P ≤ 0.05) is equal to 0.05 significant level, therefore we reject the null hypothesis and accept the alternative hypothesis which states that, there is significant relationship between the gender and their coping strategies. This implies that both males and females are looking for other means to supplement food for their households in the study area. The result in Table 7 further shows that there was no significant relationship between religions, marital status and coping strategies adapted by Zarma ethnic farmers, since p-value for variables such as religion (X^2 = 4.345; P>0.05) and marital status (X^2 = 3.582; P>0.05) are greater than 0.05 significant level, therefore we accept the null hypothesis and reject the alternative hypothesis. This means that the religion and marital status don't affect the coping strategies of the respondents.

Table7: Result of chi-square on demographic characteristics and coping strategies adapted by Zarma ethnic farmers to supplement agricultural activities (n =120)

Demographic characteristics	Chi-square value	Df	P-value	Decision
Gender	5.821	2	0.05	Significant
Religion	4.345	4	0.361	Not significant
Marital status	3.582	6	0.733	Not significant

Source: Field survey, 2012.

Table 8. Result of PPMC and chi-square on relationship between socio-economic characteristics and agricultural activities of Zarma ethnic farmers (n = 120)

Socio-economic characteristics	Tools used	X^2 or r-value	P-value	Decision
Age	PPMC	0.414	0.000	Significant
Household size	PPMC	0.567	0.000	Significant
Gender vs Cropping activities	Chi-square	30.863	0.000	Significant
Gender vs Livestock activities	Chi-square	5.584	0.061	Not significant
Marital status	PPMC	4.956	0.292	Not significant
Religion	PPMC	4.398	0.624	Not significant

Source: Field survey, 2012.

The results in Table 8 show that age (r = 0.414, p = 0.000), and household size (r = 0.567, P = 0.000) are significantly related to agricultural activities, and the chi-square test showed that gender (x^2 = 30.863, P = 0.000) has significant relationship with cropping activities but gender (x^2 = 5.584, P = 0.061) has no significant relationship with livestock activities. The result on the Table further revealed that religion (r = 4956, P = 0.292), marital status (r = 4.398, P = 0.624) have no relationship with agricultural activities in the study area. This result translates to the fact that as the age and size of the households increases the likelihood of increase in participation in agricultural activities because households with higher family size are likely to enjoy free supply of labour in their activities and individuals with average age are also likely to be stronger in their activities.

4. Conclusions

From the findings of the study, it can be concluded that close to half or significant proportion of the Zarma ethnic farmers are in their active age of between 25-39 years. Millet, groundnut and black-eye beans are the major crops regularly produced in the study area. The livestock regularly reared in the study area include goat and poultry, while significant proportion also keep cattle and sheep. Majority of the Zarma ethnic farmers are engaged in selling of processed food crops and trading of livestock as alternative income generating activities. A higher proportion agreed that they are getting enough from agricultural activities despite the fact that government is not encouraging agricultural compare to other sectors.

The most severe constraints encountered in the study area include lack of fertilizer, pesticides, feeds, drugs, credit facility, basic infrastructure and extension service. Socio – economic characteristics such as gender, age and household size are significantly related to most agricultural activities. The Niger government programmes aimed at intensifying agricultural production will be more effective if rural areas are most targeted especially where agricultural activities are the major occupation of the people. Agricultural extension services in the study area need to be intensified to transfer relevant and better farming techniques to the study area in order to boost the agricultural activities. The government and non- governmental organization should intervene in the supply of agricultural inputs such as fertilizer, supplementary livestock feeds and drugs, pesticides and infrastructural facilities to the study area as this will not only boost agricultural activities but also check the effect of rural-urban migration of the people.

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