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SOCIO-ECONOMIC DETERMINANTS OF SMALL RUMINANTS PRODUCTION AMONG FARMERS IN OSUN STATE, NIGERIA

E.O. FAKOYA AND *A. OLORUNTOBA

Department of Agricultural Extension and Rural Development,
University of Agriculture, PMB 2240, Abeokuta, Nigeria.
E-mail: facoya2003@yahoo.co.uk
***Corresponding author:** yomitoba@hotmail.com

ABSTRACT

In the study, the socio-economic determinant of small ruminants' production in rural setting in Nigeria was investigated. Structured questionnaire was used for data collection from 120 small ruminants' farmers and analysed with descriptive statistics and regression analysis. Findings show that older farmers (55%) dominated ownership of goats and sheep. Semi intensive system was still practiced with majority dependent on forage grazing for the animals. Major identified problems constraining small ruminant production included lack of capital/credit, land, pests/diseases and feed shortage. A regression analysis result showed that certain socio-economic variables such as income, years of rearing experience and educational level had direct impact on small ruminant production *(R^2=0.78).* The findings suggest that improved small ruminant production could be achieved by giving considerations to those significant variables; creating enabling environment through the provision of micro-credit and extension services to ameliorate the problems faced by the farmers.

Key words: Socio-economic, small ruminant, ownership, rural Nigeria

INTRODUCTION

In most developing countries, the ownership of small ruminants varied from households, farmers with mixed farming activities to some landless agriculture migrant workers. Sheep and goats are kept around the homestead or on small farms in villages and small towns. For instance, in Northern Nigeria, sheep are kept by pastoralists who depend on very large herds of small ruminant for one attribute or the other. Doward *et al*. (2005) noted the contributions of livestock to rural economies in the form of providing for subsistence consumption; supporting complementary activities such as the provision of draft power or manure; buffering against seasonality in income from other activities; and providing some assets. Shackleton *et al.* (2000) observed that even non-owners of livestock in the communities could benefit from them by collecting dung for free and receiving gifts in the form of milk and meat and also ploughing services.

Goat and sheep have been classified as medium sized herbivores and ruminants. According to Aliyu (1999) they were probably among the first animals to be domesticated by man and were used as food. According to Rege (1996) and Ojoye (2006), indigenous sheep and goat breeds constitute over 90 percent of the small ruminant population in

Africa. Generally, small ruminants are highly adaptable to a broad range of environment, require less capital investment in building houses and buying other materials required for their upkeep, space and maintenance (Iyiegbuniwe, 2003). The distribution of small ruminant animals (sheep and goats) varied according to climate management systems and their susceptibility to disease in their environment (FAO 2003; Okunlola 1991 and ILCA 1983). Various breeds of sheep and goats exist but the West African Dwarf (WAD) which is hardy and strong is common in Northern Nigeria. Goat and sheep were spread all over Nigeria before the independence in 1960 and WAD types dominated the forest and derived savannah (Holme and Sheperd, 2003). In Southwestern Nigeria, small ruminants' production is of secondary importance to crop production hence, small ruminants are widely distributed among the rural populations. Smallholder's ruminant farmers lack access to land, capital and labour while opportunities to earn off-farm income are limited.

From the socio-economic perspective, small ruminant production is a source of investment and instrument against disaster (Okunlola, 2002). Small ruminants are used in ceremonial feasting and payment of social dues. In the religious circle, sheep are used by Muslims to fulfill religious obligation and goats as a source of protein. Aliyu (1999) posited that small ruminants play an important role in the economic life of the small holder farmers, converting low cost inputs to high value products (meat, milk and skin). The socio-economic characteristics of small ruminant farmers in the study area is essential in order to answer the question as to whether they are to adopt and sustain livestock farming in their efforts to ensure food security and income generation. The objective of the study was to identify socio-economic determinants of small ruminant's production among farmers in Osun state, Nigeria. Specifically, the study explored the socio-economic characteristics of farmers; ascertained the production system of small ruminant; identified the constraints to small ruminant production, and determined the relationship between socio economic characteristics and small ruminant herd size.

LITERATURE REVIEW

Many socioeconomic factors appear vitally important in small ruminant's production in literature, empirical studies and personal observations. Inomi *et al.* (2006) posited that annual income, household size and gender of household head are statistically significant determinants of the value of flock in smallholder production. Gender inequality in livestock ownership has traditionally been measured in terms of gaps in men's and women's opportunities and outcomes. Ownership and control over assets such as land provide benefits to farmers as collateral for credit that can be used for investment or consumption. According to Doss, *et al.* (2008), quoting Banerjee and Duflo (2003); Barham *et al.* (1995); Barrett and Carter (2005); Birdsall and Londono (1997); Carter and Zimmerman (2000) asset inequality, combined with market failures, lead to differential productivity between the asset poor and asset rich. These create poverty and inequality traps.

In terms of gender and asset ownership, women may not receive the benefits of assets held by men, even when they live in the same household (Deere and Doss, 2006). It has also been reported by Agarwal (2001) that personal endowments (such as educa-

tional levels, property status) of women and social infrastructure determine their participation in decision making. Studies by Agarwal (1998; 2002); Mason (1998) and Allendorf (2007) found that women who owned land had greater say in household decision-making than women without land. Grown *et al.,* 2005 reported that the UN Millennium Project Task Force on Gender Equality and Women's Empowerment recommends that countries and agencies use a measure of the gender asset gap, such as the incidence of asset ownership by men and women, as an indicator of progress toward Millennium Development Goals 3. Education is not only related to the ability to obtain and process information, but is often conducive to implementing knowledge-intensive conservation and sustainable agricultural technologies (De Souza Filho, 1997).

The ability of agro-ecosystem to withstand stress and shock, determines the persistence or durability of an agro-ecosystem's productivity under known or possible conditions. According to Conway (1987), sustainability is defined as the ability of an agroecosystem to maintain productivity when subjected to stress or shock. Stress is a frequent (sometimes continuous) relatively small and predictable disturbing force that has a large cumulative effect. Examples of stress in small ruminant production are lack of capital and concentrate/fodder. Alternatively, the disturbance can be caused by a shock, which is defined as an infrequent, relatively large and unpredictable force that has an immediate effect. Examples of shock in this case are pests and diseases; livestock however could provide safety net when crops failed (Dolberg 2001).

In small ruminant production, grazing and water are common property resources meant for common use of the villagers without individual ownership rights (Jodha, 1986). Consequently, public or common pasture ownership has thus been singled out as a threat to proper range management (Gilles and Jamtgaard, 1981). Livestock production also provides a constant flow of income and reduces the vulnerability of livelihoods (Birthal and Rao, 2002). Small ruminant's production being less capital-intensive is an important option for small ruminant farmers because of its low land requirement, low initial investment and low operational costs (Birthal and Ali, 2005).

METHODOLOGY

The study was conducted using a sample of 120 small ruminant farmers in Osun state selected through a multi-stage random sampling procedures. Stage one involved the random selection of four out of the 30 Local Government Areas (LGAs) in the state. The selected LGAs are Olorunda, Isokan, Odo-Otin and Atakumosa East (representing 13%). Stage two involved random selection of three villages from each of the LGA. The final stage involved purposive selection of 10 small ruminant farmers from each village and a total of 30 farmers from each LGA. Data on socio–economic characteristics, production systems and constraints were elicited using interview guides and analysed with both descriptive statistics and regression analysis.

Regression Model

Regression analysis was used to ascertain the contributions of selected farmers' socio-economic characteristics to small ruminant production systems. The multiple regression equation estimated using three functional forms namely: linear, semi log and double log. The estimated model is given as:

$Y = A + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + . \mathcal{C}$ ----------(1)

where,

Y = Small ruminant production (herd size)

A = Constant

X_1 = Age (in years)

X_2 = Household size (number of people)

X_3 = Income (Nigerian Naira, NGN)

X_4 = Gender of Herd owners (female, male)

X_5 = Rearing experience (in years)

X_6 = Educational level

$\mathcal{C}$ = error term, assumed to be independently and normally distributed

The model shows the coefficient of multiple determination (R^2), which explains the 'goodness of fit' for the relationship between the dependent variable and each independent variables in the equation.

RESULTS AND DISCUSSION

Table 1 presents the socio-economic characteristics of small ruminant production farmers. Ownership of livestock is an important source of income and wealth accumulation. Findings showed that women own small ruminants and other backyard animals. Majority of the farmers (70.83%) were females. The mean age of the respondents was 41.21 years and the level of literacy was high (85%). About half of the farmers (50.83%) are Muslim. The mean rearing experience was 6.31 years, the mean household size was six persons, the mean herd size was nine and the mean income was N10, 005 (USD 86.55) implying smallholders' characteristics. Cursory observation revealed that goats are more popular than sheep. This may probably be due to the fact that goats are perceived to be a lower risk investment than sheep. Majority (72.5%) are married. This may probably explain why in sub-Saharan Africa, marriage increase herd ownership and may probably be one of the common ways for women to gain access to land, and their rights to land.

Table 2 shows that a sizeable proportion (35%) of the small ruminants was produced using extensive system, while most farmers (57.50%) employed semi intensive system and very few (7.55) practiced intensive system. Goat rearing has implication on the environment as it has been shown that intensive and semi intensive systems constitute nuisance to the environment than extensive system (Okunlola, 2002). Small ruminants are kept around the homestead or on small farms without large fodder. Hence, majority (72.5%) of the farmers depend on forage grazing due to high cost of concentrate. The result has implication for sustainable management of agroecosystem.

Table 3 presents identified constraints to small ruminant production by farmers. However, when the constraints were ranked in order of severity by farmers, lack of assets such as capital/credit (93.33%), lack of access to land (90.83%), pests and diseases (86.7%) and feed shortage (81.7%) featured as most serious constraints. It has been shown that an unequal distribution of land could hinder economic growth (Deininger and Square, 1998). Security of land tenure is the key to having control over major decisions in agriculture and livestock production: what technique to use, which products to sell and which to consume are examples. The law of succession influences the distribution

of land, the security of tenure and it is often a pre-condition for access to capital/credit and a key link in the chain from household food security production to national food security (Hulme and Mckay, 2005). When people have more assets, they experience less vulnerability and insecurity in the face of risks; conversely, the more assets are eroded, the greater is people's vulnerability (Mosher, 2007). Livestock rearing depends on feed concentrate and common grazing land which were in short supply. This assertion was in line with Legesse *et al.* (2008).

Regression Analysis

The socio-economic factors hypothesised to determine small ruminant herd size have been shown to be relevant in previous study by Vanslembrouck *et al.* (2002). Table 4 indicates the results of the fitted regression estimated from equation 2.

$Y = 4.74 + 0.23\ (X_1) + 0.03(X_2) + 0.05(X_3) + 0.57(X_4) + 0.03\ (X_5) + 0.024\ (X_6)\quad R^2 = 0.78$------ (2)

(1. 31) (1.40) (2.64) (3.41) (2.45) (0.20)

The coefficients of four of the explanatory variables, that is, age of the farmers (X_1), income (X_3), years of rearing experience (X_5) and educational level (X_6) were found to be positively significant at α = 1.0, 5.0 and 10.0%. The coefficient of multiple determination R^2 was also found to be 0.78, meaning that about 78 per cent variation in small ruminant production is explained by the independent variables identified. Inomi *et al.* (2006) confirms that income from smallholder livestock operation have a positive and statistically significant effect on improved nutrition, food security and consequently rural poverty reduction. One explanation that could be offered for the significant positive educational level is that high literacy could positively affect small ruminant herd size (Y).

Table 1: Distribution of Farmers by their Socio-economic Characteristics

Variables	Categories	Frequency	Percentage	Mean
Herd ownership	Female	85	70.83	
	Male	35	29.17	
	Total	**120**	**100.0**	
Age (years)	less than 30	16	13.33	
	31–40	37	30.84	
	41–50	42	35.00	41.21
	Above 50	25	20.83	
	Total	**120**	**100.0**	
Marital status	Single	29	24.17	
	Married	87	72.50	
	Widowed	4	3.33	
	Total	**120**	**100.0**	
Education	No formal Education	18	15.00	
level	Primary	31	25.83	
	Post Primary	59	49.17	-
	Post Secondary	12	10.00	
	Total	**120**	**100.0**	
Religion	Christianity	54	45.00	
	Islam	61	50.83	
	Traditional	5	4.17	
	Total	**120**	**100.0**	
Household	less than 3	18	15.00	
Size	> 4– 6	49	40.84	
	7–9	33	27.50	6.01
	10–12	16	13.33	
	Above 12	3	2.50	
	Total	**120**	**100.0**	
Income /month	less than < 5000	13	10.83	
(N)	500 – 1000	53	44.17	
	10001–15000	28	23.33	
	15001–20000	17	14.17	N10, 005
	Above 20,000	9	7.50	
	Total	**120**	**100.0**	
Herd size	less than 5	22	18.33	
	6–10	46	38.33	
	11–15	34	28.34	8.94
	16–20	13	10.83	
	Above 20	5	4.17	
	Total	**120**	**100.0**	
Rearing	less than 3	18	15.00	
Experience (years)	4–6	53	44.17	
	7–9	32	26.67	6.31
	Above 10	17	14.16	
	Total	**120**	**100.0**	

Note: USD 1.00=NGN115.60 as at September 2008

Table 2: Distribution of farmers by small ruminants' production system

Variables	Categories	Frequency	Percentage
Rearing methods	Extensive	42	35.00
	Intensive	9	7.50
	Semi Intensive	59	57.50
Feeding method			
	Concentrate	8	6.67
	Forage grazing	87	72.50
	Concentrate and Forage	25	20.83

Table 3: Constraints to Small Ruminant Production

S/N	Constraints	Frequency	Percentage	Rank
1.	Lack of capital/credit	112	93.33	1st
2.	Socio cultural factors	73	60.33	8th
3.	Poor management system	69	57.50	10th
4.	Theft of animal	96	80.00	5th
5.	Problem of pests and diseases	104	86.67	3rd
6.	Inadequate supply of labour	72	60.00	9th
7.	Market availability/marketability	83	69.17	7th
8.	Lack of access to drugs	90	75.00	6th
9.	Animal feed shortage	98	81.67	4th
10.	Lack of access to land	109	90.83	2nd

CONCLUSION AND RECOMMENDATIONS

The findings of the study suggest that selected socio economic characteristics have become linked with small ruminant production. More importantly, possession of small ruminants was positively influenced by gender of herd owners, land ownership, access to capital. Younger women with less few years experience reared goats and sheep.

Table 4: Multiple Regression Result

Form of equation	Sample size	A	X1	X2	X3	X4	X5	X6	R2
Linear	120	-5.43	17.94***	-26.08**	29.97**	67.0***	99.30	34.24	++
			(3.17)	(-2.07)	(2.29)	(4.50)	(2.05)	(3.56)	0.76
Semi Log	120	-7.85	46.02	40.08*	37.91	48.60	13.34**	0.20**	++
			(1.40)	(1.54)	(1.09)	(2.13)	(3.43)	(1.64)	0.67
Double Log	120	4.74	0.23*	0.03*	0.05**	0.57**	0.03***	0.024**	++
			(1.31)	(1.40)	(2.64)	(3.41)	(2.45)	(0.20)	0.78

Figures in parentheses represent are the *t – value*

*** t – value significant at 1%

** t – value significant at 5%

* t – value significant at 10%

++ *F*– value significant at 1%

Notable problems constraining small ruminant production were also identified to include inputs such as capital/credit, land, pests/diseases and shortage of feeds among others.

To stem this tide, the study recommends that improved small ruminant production could be achieved by creating enabling environment to ameliorate problems faced by farmers. For instance, farmers cooperative could be initiated to offer opportunities to members to have access to capital/credit and other inputs.

This cooperative should benefit both men and women in terms of marketing. Capacity building efforts through this cooperative could also raise the awareness, build leadership qualities and also have the function of channeling the interests of their members by influencing extension services and project development. The use of alternative feed resources could be an alternative feeding plan that could mitigate hardship faced in small ruminant farming. Future studies could explore intra household pattern of gender ownership of small ruminants by location and over time.

REFERENCES

Agarwal, B. 1998. Widows vs Daughters or Widows as Daughters? Poverty, Land and Economic Security in Rural India, "In Chen, M.A (ed), Widows in India: Social Neglect and Public Action. New Delhi: Sage Publications, pp 124-169

Agarwal, B. 2001. Participatory Exclusions, Community forestry, and Gender: An Analysis for South Asia and a Conceptual Framework. *World Development,* 29(10): 1623-1648

Agarwal, B. 2002. Are we not Peasants too? Land Rights and Women's Claims in India. SEEDS Number 21. New York: Population Council.

Allendolf, K. 2007. Do Women's Land Rights Promote Empowerment and Child Health in Nepal? *World Development,* 35(11): 1975-1988

Aliyu, S U. 1999. Sheep and Goat production, Extension Bulletin No. 46 Livestock Service pp 81–82

Birthal, P.S., Rao, P.P. 2002. Economic Contribution of Livestock sector in India. In: Birthal, P.S and Rao, P.P (eds.). Technology Options for Sustainable Livestock Production in India. New Delhi: National Centre for Agricultural Economics and Policy Research.

Birthal, P.S., Ali, J. 2005. Potential of Livestock sector in Rural transformation. In R. Nayyar and Sharma, A.N (eds.) Rural Transformation in India. The Role of Non-Farm sector. New Delhi: Institute of Human Development and Manohar Publishers and Distributors.

Conway, G.R. 1987. The Properties of Agroecosystems. *Agricultural Systems,* 24(2): 95-117

De Souza Filho, H.M. 1997. The Adoption of Sustainable Agricultural Technologies: A Case Study in the State of Espirito Santo, Brazil. Ashgate Publishing Limited, Aldershot, UK.

Deere, C.D., Doss, C.R. 2006. The Gender Asset Gap: What do We Know and Why Does it Matter? *Feminist Economics,* 12 (1&2): 1-50

Deininger, K., Square, L. 1998. New Ways of Looking at Old Issues: Asset Inequality and Growth: *Journal of Development Economics,* 57(2): 259-287

Dolberg, F. 2001. A Livestock Development Approach that contributes to Poverty Alleviation and widespread Improvement in Nutrition among the poor. *Livestock Research for Rural Development,* 13(5)

Doss, C.C. Grown., Deere, C.D. 2008. Gender and Asset Ownership: A Guide to Collecting Individual-level Data. Policy Research Working Paper 4704. The World Bank, Washington, D.C 76 pp

Doward, A., Anderson, A.S., Pattison, J., Pas, R., Rushton, J., Sanchez, V.E. 2005. A Guide to indicators and Methods for Assessing the Contribution of Livestock Keeping to the Livelihoods of the Poor. Department of Agricultural Sciences, Imperial College, London. p.5

FAO 2003. The State of Food Insecurity in the World. Food and Agricultural Organization Rome pp36–42

Gilles, J. L., Jamtgaard, K. 1981. Overgrazing in Pastoral Areas: The Common Reconsidered. *Sociologia Ruralis* 21 (2)

Grown, C., G.R. Gupta., Res, A. 2005. Taking Action: Achieving Gender Equality and Millennium Development Goals. London: Earthscan Publications.

Hulme, D., Mckay, A. 2005. Identifying and Measuring Chronic Poverty: Beyond Monetary Measures. CPRC-IIPA Working Paper 30. Manchester: Chronic Poverty Research Center.

Hulme, D., Sheperd, A. 2003. Conceptualizing Chronic Poverty. *World Development,* 31(3): 403-423

ILCA. 1983. Small Ruminant Production in the Humid Tropics ILCA Addis Ababa Ethiopia 122p

Inomi, O.E., Chukwuji, O.D., Ogisi, O.D., Oyaide, W.J. 2006. Alleviating Rural Poverty: What Role for Small-holder Livestock Production in Delta State, Nigeria. *Agriculturae Conspectus Scientificus,* 72(2): 159-164

Iyiegbuniwe, H.O. 2003. Socio Economic factors Influencing Small Ruminant Animal Production among Rural Families in Ona Ara Local Government Area of Oyo State. Unpublished B. Agric. Dissertation, University of Agriculture, Abeokuta., Nigeria. 54pp

Jodha, N.S. 1986. Common Property Resources and Rural Poor in Dry Regions of India. *Economic and Political Weekly,* 31(27): 1169-1181

Legesse, G., Abebe, G., Siegmund-Schultze, A., Valle Zarate 2008. Small Ruminant Production in two mixed-farming systems of Southern Ethiopia: Status and Prospects for Improvement. *Experimental Agriculture*, 44: 399-412

Mason, K. 1998. Wives Economic Decision-making Power in the Family: Five Asian Countries. In K Mason (ed). The Changing Family in Comparative Perspective: Asia and the United States. Honolulu: East-West Center.

Mosher, C. 2007. Introduction. In C. Mosher (ed). Reducing Global Poverty: The Case for Asset Accumulation. Washington, D.C. Brookings Institution Press.

Ojoye, O.C. 2006. Factor Affecting Small scale Goat and Sheep Production in Abeokuta LGA of Ogun State. Unpublished B.Agric. Dissertation, University of Agriculture, Abeokuta, Nigeria. 43pp

Okunlola, J.O. 1991. Socio-economic Constraints to Sheep and Goat Production in Ekiti and Ondo States, Nigeria. Unpublished M.Sc. Thesis, Department of Agricultural Extension Services, University of Ibadan, Nigeria. pp 12– 46

Okunlola, J.O. 2002. Socioeconomic Factors Affecting Large Scale Goat and Sheep Production in Ondo State. Proceedings of the 27th Annual Conference. Nigerian Society for Animal Production held at FUTA between March 17–21, 2002 pp 355–358

Peters, M., Horne, P.S., Schimdt, A.. Holman, F., Kerridge, P., Tarawali, S.A., Schultze-Kraft, R., Lascano, C.E., Argel, P., Stur, W., Fujisaka, S., Muller-Samann, K., Wortmann, C. 2000. The Role of forages in Reducing Poverty and Degradation of Natural Resources in Tropical Production Systems. Agricultural Research and Extension Network, No 117

Shacleton, S., Shacleton, C., Cousins, B. 2000. Re-valuing the Communal Lands of Southern Africa: New Understandings of Rural Livelihoods. ODI Natural Resources Perspectives 62.

Vanslembrouck, I., Van Hylenbroeck, G., Verbeke, W. 2002. Determinants of the willingness of Belgian farmers to participate in agri-environmental measures. *Journal of Agricultural Economics,* 53(3): 489-511

Rege, A. O. 1996. Goat in Yemen. Animal Genetic Resources Information pp 34-45

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