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SMALL RUMINANT PRODUCTION CHARACTERISTICS BY RURAL FARM-FAMILIES AT NAERLS ADOPTED VILLAGES OF NORTH-WEST NIGERIA

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ABSTRACT

The characteristics of small ruminant production by rural farm-families at National Agricultural Extension and Research Liaison Services (NAERLS) adopted villages were studied in other to identify the socio-economic characteristics of the small ruminant farmers and their production characteristics. One hundred and forty respondents (28 from each of the five villages) were randomly selected from Guga, Hayin Gada, Nasarawa Buhari, Sakadadi, and Tundu Iya. Primary data were collected using interview scheduled which had been pre-tested and subjected to face validity. Quantitative data on farmers' personal and socio-economic variables as well as small ruminant production characteristic, perception on profitability, etc. were gathered. Data collected on socio-economic characteristics of the respondents were analyzed using frequencies counts and percentages. Chi-squares (SPSS, 2008) was used to test the distributions of entries within variables in the study area. Small ruminant farmers in NAERLS adopted villages perceived their ventures of rearing sheep and goats are profitable ($P<0.01$). Far less than half (37.9%) of them used improved practices such as supplementary feeding, vaccination/medication, provision of housing, etc. However, a large proportion of the farmers belonged to farmers' association and had access to extension services. It is therefore recommended that the adopted village concept in NAERLS and other National Agricultural Research Institutes (NARIs) should be further sustained with adequate funding. Smallholder livestock farmers at the adopted villages should be encouraged to increase their investments in improved practices.

Keywords: Small ruminants, livestock, adopted villages, NAERLS

INTRODUCTION

Smallholder small ruminant farmers keep sheep and goats mainly for financial security. Most small ruminant farmers in developing countries are not qualified to be called farmers but 'owners' because their method of production is characterized by low inputs, which result in poor growth performance and very high mortality rates. The farmers' responsibilities, in most cases, stop at purchasing one or two does, which are then reared extensively. However, small ruminant animals play a significant role in the food chain and overall livelihoods of rural households where they are largely the property of women and their children (Lebbie, 2004). The basic production characteristics of small ruminant include the flock management system, size of the flock, feeding regime, labour use, litter productivity, health management, source of finance and market availability. Small ruminant are an important but neglected resource in developing countries (El-Aich and Waterhouse, 1999). Government policies are mainly geared to crop and cattle production (Dubeuf *et al*., 2004; Devendra, 2002). Lack of information on the contribution of small ruminant to rural households is assumed to be one principal reason for the non-recognition of

their importance by policy makers and relevant institutions.

Lapar *et al*. (2003) stated that smallholders generally have inadequate capital and lack experience in improved technologies. Households in rural areas do not usually have access to banking facilities and thus have come to rely on investment in their small ruminant stock, serving as "backyard savings of money" (Lebbie, 2004). The adopted village concept was introduced in 1996 under the World Bank assisted programme to address inaccessibility of improved technologies generated by research and provide an effective linkage among research, extension and farmers (Abubakar, 2008 and Oyedokun, 2009). There is a need for good understanding of small ruminant production characteristics of the rural farm families if effective intervention is to be achieved. This paper is therefore aimed at examining small ruminant production characteristics by rural farm-families in NAERLS-adopted villages in the North West Nigeria. Specifically, it will access the socio-economic characteristics of the small ruminant farmers, identify their production characteristics and suggest possible ways of improvement.

METHODOLOGY

Small ruminant farmers in adopted villages of National Agricultural Extension and Research Liaison Services (NAERLS) in North Western zone of Nigeria were the focus of this study. One hundred and forty respondents (28 from each of the five villages) were randomly selected from Guga, Hayin Gada, Nasarawa Buhari, Sakadadi, and Tundu Iya. Guga and Hayin Gada are in Giwa Local Government of Kaduna State. Nasarawa Buhari and Sakadadi are in Sabon-Gari Local Government Area of Kaduna State while Tundu Iya is in Funtua Local Government of Katsina State. Primary data were collected using interview scheduled which had been pre-tested and subjected to face validity. Quantitative data on farmers' personal and socio-economic variables (sex of farmer, age, marital status, education status) as well as small ruminant production characteristic, perception on profitability, etc. were gathered. Data collected on socio-economic characteristics of the respondents were analyzed using frequencies counts and percentages. Chi-squares (SPSS, 2008) was used to test the distributions of entries within variables in the study area.

RESULTS AND DISCUSSION

The socio-economic distribution of small ruminant farmers at the adopted villages in North West zone of National Agricultural Extension and Research Liaison Services (NAERLS) was presented in Table 1. The respondents were mostly males. Many of them (74.3%) are within the young active age of between 20 and 50 years old. The fact that agriculture (especially livestock production) is still carried out by active and able-bodied people is buttressed in this study. They are also mostly married (80.7%). Most of the respondents had varied level of education with about 34% having no formal education. Polygamy was more prominent among small ruminant farmers at adopted villages of NAERLS. About 80% of the respondents have 5 or more children. The most prominent primary occupation among the respondents is farming (52.1%).

Table 1: Socio-economic distributions of small ruminant farmers at adopted villages of NAERLS

Variables	Frequency	Percentage (%)
Sex of respondents		
Male	109	77.9
Female	31	22.1
Age of respondents		
20 - 30	19	13.6
31 - 40	55	39.3
41 -50	30	21.4
51 - 60	28	20.0
61 and Above	8	5.7
Marital status		
Single	14	10.0
Married	113	80.7
Divorced	12	8.57
Widowed	1	0.7
Type of family		
Monogamy	25	17.9
Polygamy	105	75.0
Non	10	7.1
Number of children		
None	10	7.1
1 - 4	20	14.2
5 - 7	42	30.0
8 - 10	39	27.9
11 and above	29	20.7
Education status		
No formal education	48	34.3
Primary	33	23.6
Secondary	47	33.6
Tertiary	12	8.6
Primary occupation		
Artisans	41	29.3
Farmers	73	52.1
Civil Servants	14	10
Housewife	9	6.4
Unemployed	3	2.1

Table 2 showed the distribution of management practices for small ruminant production at adopted villages of North West zone of NAERLS. Slightly more respondents kept sheep and goats (39.3%) than those that kept only goats (36.4%). However, the proportion of small ruminant farmers that kept only sheep were significantly ($P<0.01$) lower at 24.3%. The flock and herd management system of choice by the farmers was semi intensive system ($P<0.01$). Extensive system of management which often involves tethering

during the crop farming seasons (raining season) are the most common systems of rearing goats in Nigeria (Adu *et al*., 1986; NAERLS, 1990; Oladimeji *et al*., 2001). This system is constrained by sub-optimal health management within the smallholder goat production system, which is characterized by high incidence of internal and external parasites as well as prevalence of bacterial and viral diseases. In some regions of the country, mortality rates of kids could be as high as 50% within 12 months after birth (Ameh *et al*., 2000; Turkson *et al*., 2004).

The goodness of fit test on the distribution of flock and herd size among the stocks of small ruminant owned by respondents was not significant ($P>0.05$). However, substantial proportion of the respondents (55%) kept 7 and more heads of small ruminants. The sheep and goats kept by respondents were majorly fed ($P<0.05$) with the combination of household wastes and grazing on available pasture as well as crop residues. Labour for activities of small ruminant production in the studied locations were provided mostly ($P<0.01$) by children and women (68.6%). This is contrary to the findings of Budisatria (2000) that small ruminants were the responsibility of the parents, while children were not much involved in small ruminant activities. However, the availability of household labour is critical to small ruminant production because rural farm-families cannot rely on hired labour to manage their small ruminants. The highest frequency ($P<0.01$) of production of offspring per year was twice as stated by 48.6% of the respondents. Twinning was the most prominent ($P<0.05$) birth per parturition. There were substantial proportions of single birthed offspring as reported by 27.9% of the respondents.

A whole lot of the respondents ($P<0.01$) requested for the services of Veterinary Doctors (80.7%) on the outbreak of diseases and other health problems experienced by their stocks (Figure 1). However, the proportion of the respondents that did not engage in the use improved practices were significantly ($P<0.01$) higher (62.1%) as shown in Figure 2. Basic production inputs such as feeding, vaccination/medication and housing are rarely provided by these farmers. The low use of inputs practiced by small ruminant farmers under smallholder system is not capable of meeting burgeoning demand for consumption of animal foods (animal products) in this region of the world. However, about (37.9%) of the respondents employed improved practices such as feeding of stocks with hay and silage, selection for breeding, use of raised platform to prevent cold and provision of medications were used among others.

Table 2: Distribution of management practices for small ruminant production at adopted villages of North West zone of NAERLS

Variables	Frequency	Percentage (%)	Chi-Square	df	Probability Level
Types of small ruminant kept					
Sheep only	34	24.3	39.180	2	0.000
Goats only	51	36.4			
Sheep and goats	55	39.3			
Flock and herd management system					
Intensive	13	9.3	11.344	2	0.01
Semi-intensive	108	77.1			
Extensive	19	13.6			
Size of small ruminant flock/herd					
1 - 3	22	15.7	4.130	4	0.389
4 – 6	41	29.3			
7 – 9	39	27.9			
10 – 12	24	17.1			
13 and above	14	10.0			
Feeding of the animals					
Household waste	14	10.0	7.413	2	0.025
Grazing	10	7.1			
Combination of both	116	82.9			
Labour provision					
Children and women	96	68.6	17.737	2	0.001
Men	32	22.9			
Any person in the household	12	8.6			
Frequency of production per year					
Once	55	39.3	14.955		0.001
Twice	68	48.6			
I don't know	17	12.1			
Average number of offspring produced at a time					
Single	39	27.9	10.043	3	0.018
Twins	68	48.6			
Triplet	4	2.9			
More than three	2	1.4			

df = degree of freedom

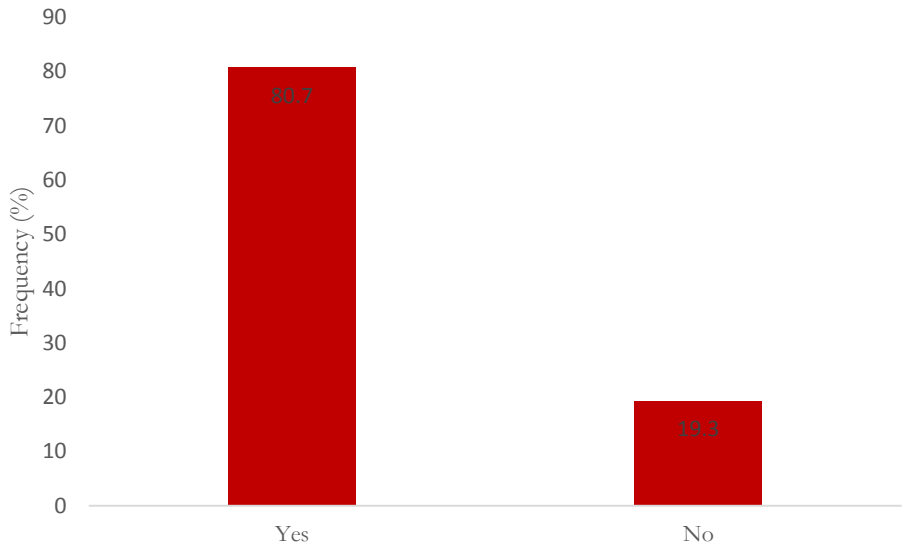


Figure 1: Small ruminant farmers' request for veterinary services for their animals (χ^2 = 10.324; df = 1; Pvalue = 0.001)

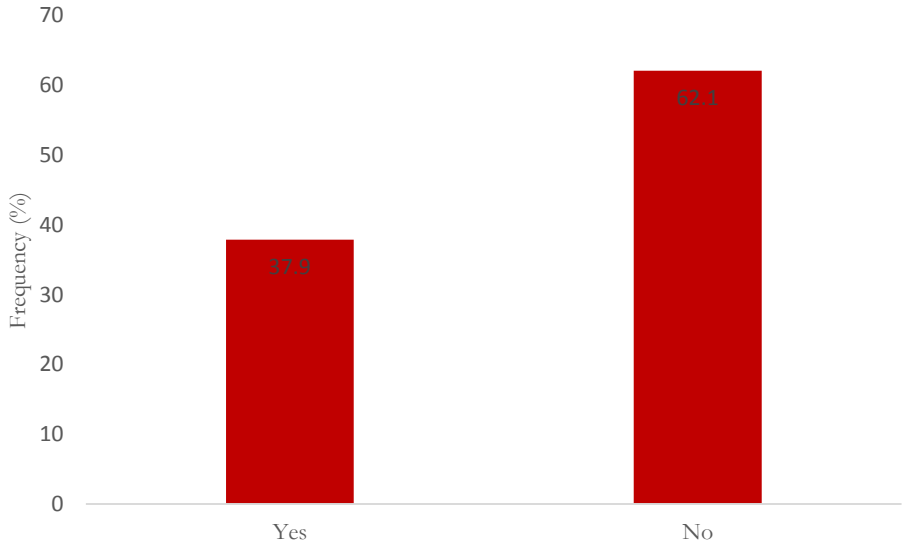


Figure 2: Uses of improve practices for small ruminant production (χ^2 = 13.390; df = 1; Pvalue = 0.000)

The goodness of fit test of the distribution of products usually obtained by small ruminant farmers was not significant (P>0.05) as presented in Figure 3. However, meat was the most important product obtained by 61.7% of the respondents from small ruminants at NAERLS adopted villages in North West Nigeria. Other products were hide and skin (17.1%) and milk (2.1%). Figure 4 showed the nature of markets patronized by sheep and goat farmers at adopted villages of NAERLS in North West Nigeria. Both organized (scheduled community markets) were employed for the sales of sheep and goats by 65% of the respondents. Akewusola *et al*. (2017) reported a large proportion of small ruminant farmers

(65%) in Ibadan (Oyo State, Nigeria) sold their stocks directly to butchers while 11% sold to middlemen. Marketing of small ruminant is expected to include all the activities involved in movement of sheep and goats from the point of production to the hand of end users/consumers (Endeshaw, 2007). Aduku *et al*. (1991) stated that live weight prices were higher, on the average, for male goats. Non-weight factors such as knowledge of the market, mode of dressing and fluency in Hausa (the local language) also influenced the sale price of goats. Goats were found to be more expensive at the onset of the planting season, late hours of market days and during festive periods.

Figure 5 showed the perception of farmers on profitability of small ruminant rearing. A whole lot of the respondents (90.7%) perceived small ruminant rearing as a profitable venture ($P<0.01$). The extension implication of these findings is that farmers will be willing to adopt technologies that will help them to improve their production. Hamidu (2015) in a study of profitability assessment and determinants of sheep production in Gombe metropolis of Gombe State, Nigeria stated that return per naira invested in sheep production is 4.11.

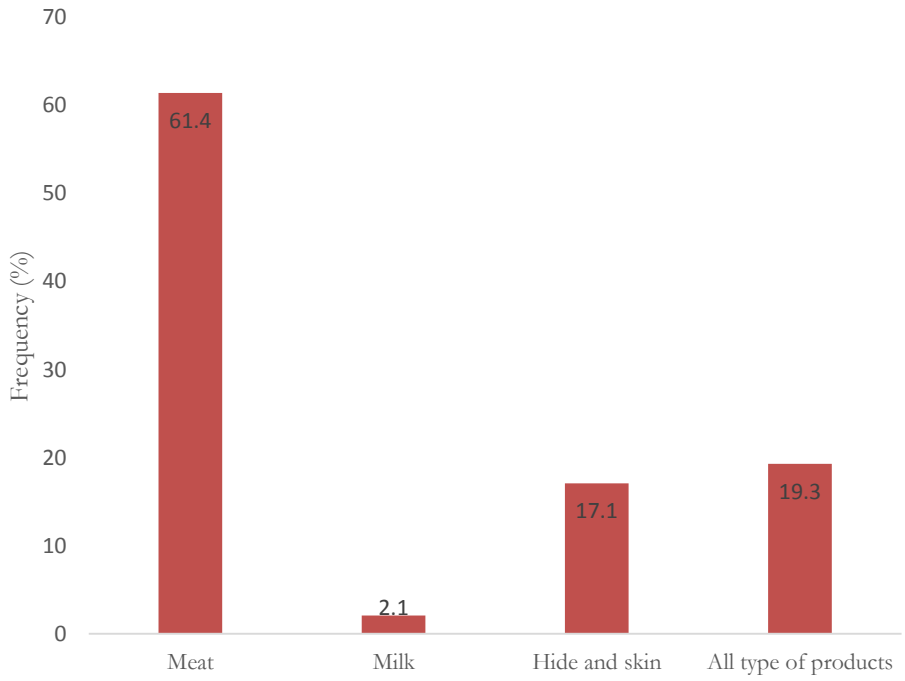


Figure 3: Type of products obtained by small ruminant farmers
($\chi 2 = 3.752$; df = 3; Pvalue = 0.290)

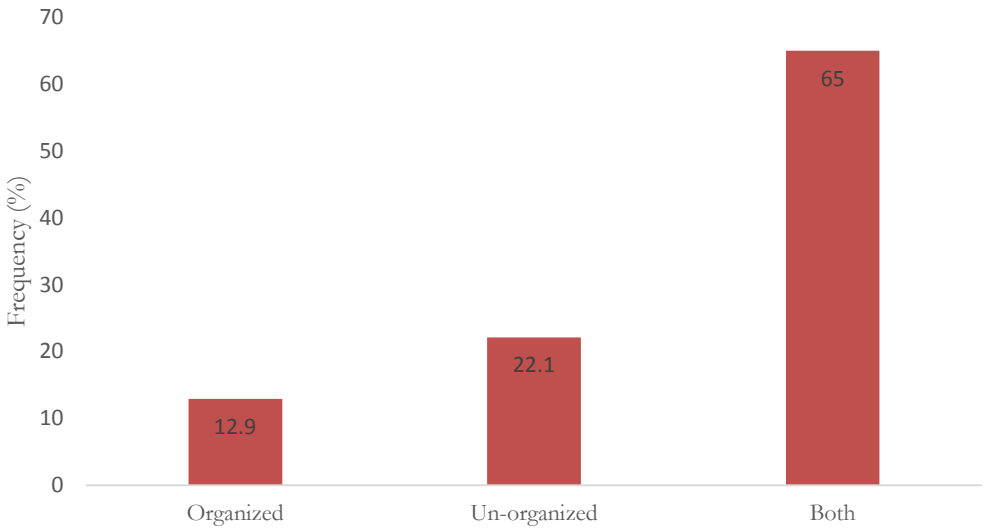


Figure 4: Nature of market patronized by small ruminant farmers
(χ^2 = 5.359; df = 2; Pvalue = 0.069)

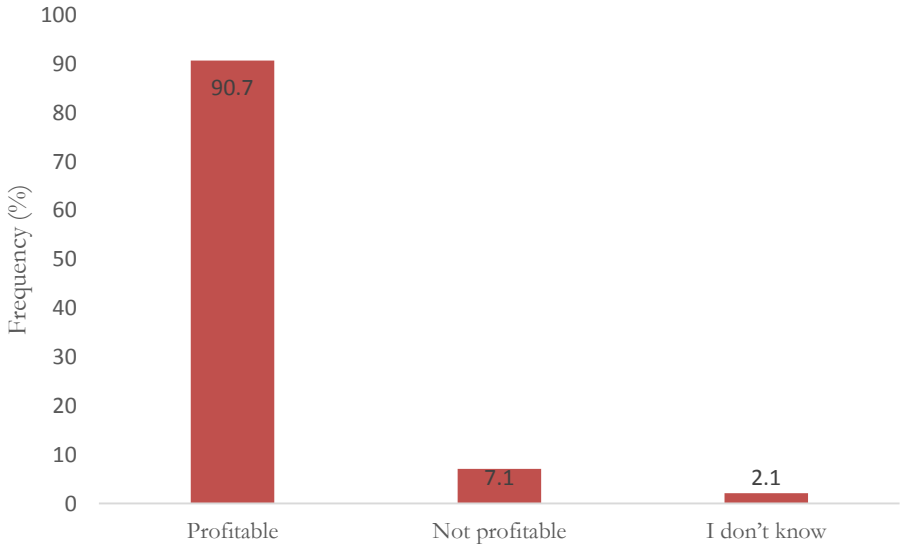


Figure 5: Perception of farmers on profitability of small ruminant rearing
(χ^2 = 14.331; df = 2; Pvalue = 0.001)

There is a marked difference (P<0.01) in farmers' access to extension services; about 76% of the respondents indicated access to extension services (Figure 6). This result was expected since adopted villages are expected to enjoy more frequent visits at least by the adopting National Agricultural Research Institutes (NARIs). The proportions of respondents' membership of farmers' association was shown in Figure 7. About 60% (P<0.01) of the respondents were members of farmers' association. Mobilization of farmers

into various organizations can enhance dissemination and adoption of proven technologies and other extension services among farmers. Kosgey *et al*. (2006) argued that formation of farmers associations and development of marketing facilities would help and enable farmers to get better prices for their animals and/or products. Meanwhile, the higher proportions of farmer's involvement in cooperative activities in the adopted villages can be linked to the presence of NAERLS extension activities. This corroborates the findings of Issa (2008) that extension personnel and institutions have high competence in formation and organization of farmers' groups. Figure 8 showed two major sources of finance for small ruminant production (personal and borrowed funds). Most of the respondents in the adopted villages ($P<0.05$) fund their small ruminant production through personal income (83.6%). This finding suggests low productivity, however, improvement in production can make a significant contribution to improved human welfare, rural sector growth and in reducing poverty (Devendra and Chantalakhana, 2002; Kosgey *et al*., 2006).

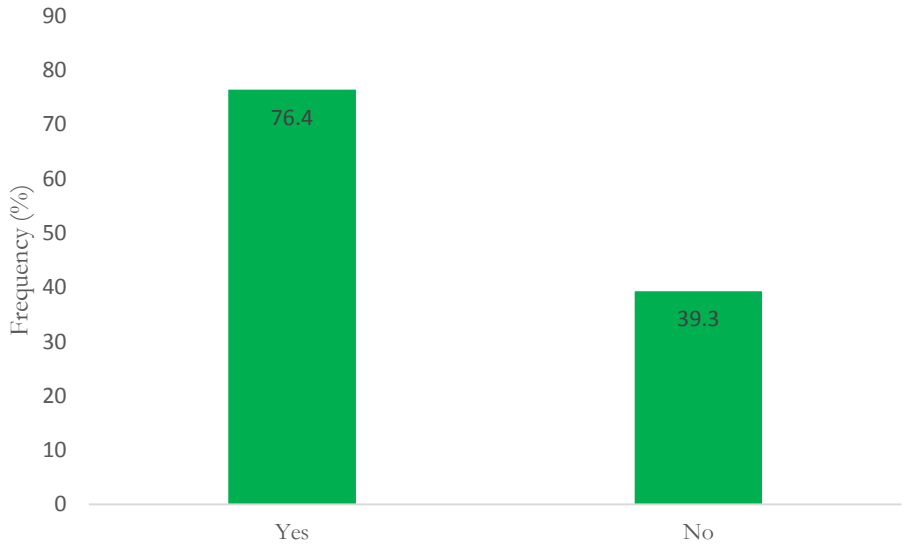


Figure 6: Small ruminant farmers' access to extension services
(χ^2 = 57.895; df = 1; Pvalue = 0.000)

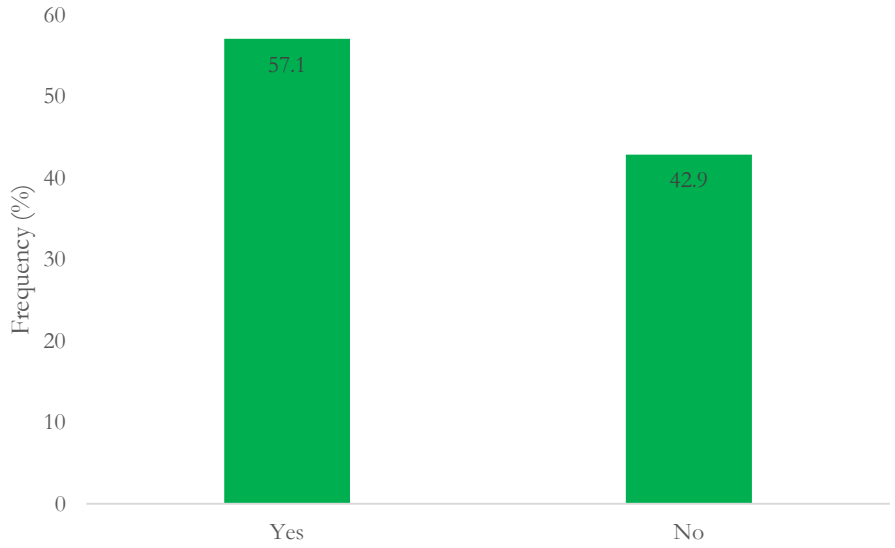


Figure 7: Small ruminant farmers' membership of farmers' association
(χ^2 = 57.895; df = 1; Pvalue = 0.000)

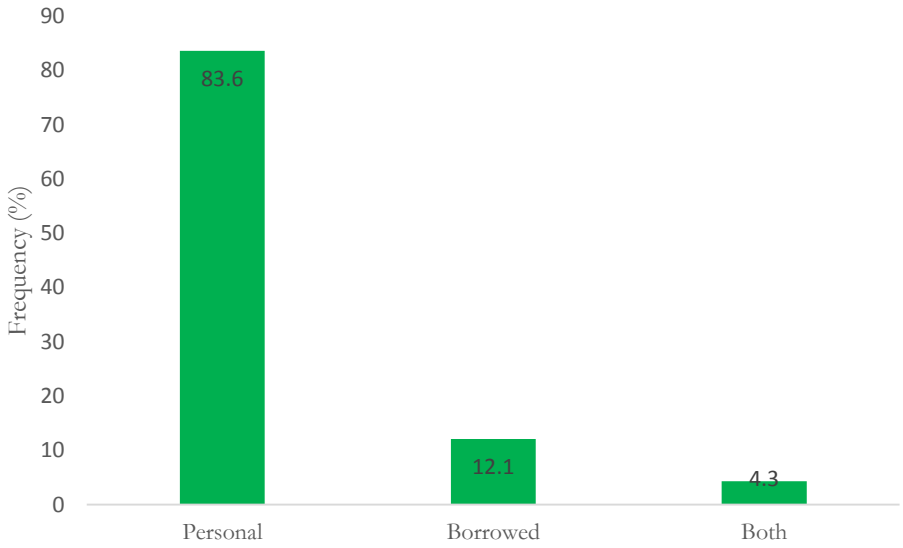


Figure 8: Source of finance for small ruminant production
(χ^2 = 7.479; df = 2; Pvalue = 0.0024)

CONCLUSION AND RECOMMENDATIONS

Small ruminant farmers in NAERLS adopted villages perceived their ventures of rearing sheep and goats as profitable. Far less than half (37.9%) of them used improved practices such as supplementary feeding, vaccination/medication, provision of housing, etc. However, a large proportion of the farmers belonged to farmers' association and had access

to extension services. Smallholder livestock farmers at the adopted villages should be encouraged to increase their investments in improved practices. Adopted village concept in NAERLS and other National Agricultural Research Institutes (NARIs) should be further sustained with adequate funding.

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