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Analysis of Small-Scale Ruminant Farmers' Use of Information Communication Technology in FCT, Abuja, Nigeria

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ABSTRACT

This study examined the use of Information and Communication Technology (ICT) among small-scale ruminant farmers in the Federal Capital Territory (FCT), Nigeria. A multi-stage sampling technique was employed to select 108 respondents across three area councils includes, Abuja Municipal Area Council (AMAC), Gwagwalada, and Abaji. Data were collected using semi-structured questionnaires and analyzed using descriptive statistics (mean, percentages, frequency counts) and inferential statistics (Chi-square analysis). Findings revealed that 50% of the farmers were aged 46-60 years, with a mean age of 46.2 years. The majority (82.4%) were male, and 89.8% were married. Education levels varied, with 38.9% having higher education (HND/BSc and above). Household size averaged 6.72 members with most households (42.6%) having between 6 and 10 members, and 42.6% had 6-10 years of farming experience. Income from ruminant farming was modest, averaging N76,111.11, with goat farmers earning N63,879.16. Radio was the most widely used ICT tool (83.3%), followed by mobile phones (mean score = 2.24). Chi-square results indicated that larger household sizes significantly influenced the use of radio ($p = 0.003$), television ($p = 0.026$), mobile phones ($p = 0.059$) and email ($p = 0.015$). The most significant challenge faced by farmers was poor network coverage, as reported by 66.7% of respondents. The study concludes that socio-economic factors like education, age, household size, income, and gender significantly influence ICT adoption among small ruminant farmers. With radios and mobile phones widely used, efforts should focus on enhancing access and content quality. The study recommends that the government and NGOs create more market opportunities for sheep and goat products, implement policies to enhance ICT accessibility and improve health-related content dissemination through ICT tools.

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Introduction

Agricultural Extension stands as a paramount public service, encompassing a wide array of responsibilities for the advancement of agriculture and rural areas [1]. Consequently, the significance of ensuring the availability of agricultural information to its users in the context of agricultural and rural development cannot be overemphasized. The provision of agricultural information enhances farmers' awareness of adoptable agricultural technologies, which is indispensable for agricultural growth and the enhancement of farmers' quality of life [2]. However, the effectiveness of information services in satisfying users and contributing to agricultural development remains a subject of contention. as cited in note that the dissemination and acceptance of agricultural information heavily depend on the mode of communication, users' viewpoints, expertise, and understanding of communication channels [3,4]. Thorough familiarity with an innovation or technology is pivotal for its successful adoption and utilization.

Over the past two decades, the emergence of Information and Communication Technologies (ICTs), notably personal computers, the internet, and mobile phones, has expanded the range of options for gathering, storing, processing, transmitting, and presenting information in various formats, catering to diverse needs and competencies [5]. Similarly, documented that the introduction of ICT-equipped agricultural centers (IACs) in Nigerian villages by NAERLS has enhanced farmers' awareness of technological advancements through internet access and other ICT tools. Despite mobile phones being widely used among extension workers, agricultural organizations have not yet systematically integrated them into extension services [6,7].

ICT has become a popular method of conveying agricultural information, especially in extension services. The traditional face-to-face method of farmer interaction has proven ineffective due to the increasing number of farmers. However, with the global ICT revolution, ICTs offer significant potential for the efficient dissemination and exchange of agricultural extension information. Agricultural sustainability and productivity worldwide depend significantly on the quality and effectiveness of extension services [1]. In Nigeria, small ruminant farmers have traditionally relied on face-to-face interactions with extension personnel for agricultural information. However, as farming households increase, the number of available extension agents has declined, creating a significant gap in the timely and relevant delivery of information for small ruminant farming. This inadequacy in extension services hampers farmers' ability to access critical knowledge essential for

productivity improvement.

ICTs have emerged as a potential solution to bridge this gap. They provide small ruminant farmers with up-to-date information on best practices in animal husbandry, breeding techniques, disease management, feeding strategies, market trends, price fluctuations, consumer preferences, and weather forecasts—key factors influencing decision-making in small ruminant production. However, despite their potential to enhance agricultural extension service delivery, ICT adoption among small ruminant farmers remains limited due to challenges such as lack of awareness, limited access to technology, and low digital literacy levels.

Globalization has increased competition in agriculture and necessitated the faster adoption and diffusion of new technologies. While globalization has helped close technological gaps in some regions, many rural small ruminant farmers in Nigeria remain disconnected due to inadequate access to information [8]. Small ruminant farmers require information on disease management, breeding techniques, animal nutrition, market prices, and weather forecasts to enhance productivity [9]. However, failure to adopt new technologies, largely due to insufficient information, remains a significant barrier to improved productivity [10].

In Nigeria, where agriculture is dominated by small-scale farmers, particularly in the small ruminant subsector, the lack of access to production and market information further limits farmers' ability to optimize their practices [11]. The absence of timely and relevant information increases transaction costs and prevents farmers from exploring better production and marketing options [12]. The growing population and commercialization of agriculture have intensified the demand for information across the agricultural value chain. Unfortunately, limited ICT adoption among small ruminant farmers hinders the spread of innovations that could boost productivity and improve livelihoods. This has constituted a gap in knowledge that need to be filled, Therefore, this study aims to analyze the use of ICTs among small ruminant farmers, explore how ICTs can address the challenges of inadequate information dissemination and improve the productivity and livelihoods of small ruminant farmers in the study area.

Objectives of the Study

The broad objective of this study is to analyse the use of Information and Communication Technologies (ICTs) as tools for agricultural extension within the context of small ruminant farming in FCT. The specific objectives are to:

- Describe the socio-economic characteristics of small ruminant farmers in the study area.
- Identify the type of ICT used by small ruminant farmers in the study area
- Ascertain the most effective ICT tools used by small ruminant farming in the study area.
- Determine the socio-economic factors influencing the use of ICT by small ruminant farmers in the study area.
- Identify the challenges encountered by small ruminant farmers in the use of ICT.

Hypothesis for the Study

Ho: There is no association between the small ruminant farmers' households' size and socio-economic factors that influence farmer's use of ICT tools.

Materials and Methods

The Study Area

The study was conducted in the Federal Capital Territory (FCT), Abuja. The area is located between latitudes 10° 20' 00" North and longitude 7° 45' 00" East. Abuja is situated in the center of Nigeria, within the Federal Capital Territory (FCT). The city is planned and was mostly built in the 1980s. It officially became Nigeria's capital on 12th December 1991, replacing Lagos. The study site is in a typical tropical biological setting, which results in generally warm weather and moderately long rainy periods. Typically, the two distinct seasons that define the FCT are the rainy season (May through October) and the dry season (December to March). There is usually a brief transitional period between April and November. The wet season normally peaks in August, whereas the dry season typically peaks in February and March with exceptionally high temperatures. The months of November through January are characterized by harmattan, a chilly and dry weather condition brought on by the northeast trade wind. The study area's vegetation is frequently dominated by grass and is a hybrid of the southern and northern Guinea Savanna's natural biomes (rainforests and savannas). The farming method is primarily focused on maize cultivation, with limited use of legumes and significant crop-small ruminant interaction. More than 80% of households depend on crop-based farming for their income. According to the Federal Ministry of Agriculture and Rural Development the estimated ratio of agricultural extension agents to farmers in each of the two wards was 1:7000 [13].

Sampling Procedure and Sample Size

A multi-stage sampling technique was employed for this study. In the first stage, three area councils namely Abuja Municipal Area Council (AMAC), Gwagwalada and Abaji were randomly selected out of the six AMAC, Bwari, Gwagwalada, Kuje, and Kwali that comprises the FCT Area Councils. In the second stage, 4 agricultural extension blocks were randomly selected from each of the 3 Area Councils to make 12 blocks per Area Council to give a total of 36 blocks in the FCT. In the third stage, 3 small ruminant farmers were purposively selected from each of the 36 agricultural extension blocks were purposively selected due to their high engagement in small ruminant production to give a total of 108 respondents involved in the study.

Method of Data Collection and Analysis

Primary data was used for this study and was collected from respondents with the aid of a semi-structured questionnaire. Skilled enumerators assisted the researcher in data collection. The dataset comprises information on the socio-economic characteristics of small ruminant farmers, the degree of ICT utilization, the effective ICT tools employed by the respondents, the preferred methods of extension delivery favored by small ruminant farmers, and the challenges they face when adopting modern ICTs in the study area. The data collected were analyzed using both descriptive statistics (frequency count, percentage, and mean) and inferential statistics (Chi-square analysis).

Results and Discussion

Socio-Economic Characteristics of Small Ruminant Farmers

The socio-economic characteristics of small ruminant farmers described in this study include age, sex, marital status, educational level, household size, small ruminant farming experience, head of household status, source of income, and frequency of extension workers' visits. As shown in Table 1, most (50%) of the small ruminant farmers were within the 46–60 age range, with a mean age of 46.2 years. Middle-aged farmers dominate this sector,

suggesting that experience and stability play significant roles in managing small ruminant farming activities. This trend is consistent with findings of indicating that older farmers are more likely to engage in small-scale livestock farming due to accumulated experience and risk aversion [14].

Furthermore, the majority (82.4%) of respondents were male, affirming that farming remains predominantly a male occupation in many regions due to cultural and societal norms [15,16]. Female participation in this sector remains low at 17.6%, highlighting a potential area for policy intervention to promote gender equity in agriculture.

Table 1 shows that the majority of farmers (89.8%) were married, highlighting the role of family support in agricultural activities. Married individuals often have better access to family labor and resources, which can enhance farming productivity [17]. The small percentages of single (7.4%) and widowed (2.8%) farmers indicate that marriage is a significant socio-economic factor in farming communities.

Regarding educational attainment, the study revealed that most small ruminant farmers (38.9%) had higher education (HND/BSc and above). Higher education levels can positively impact farming practices by enhancing farmers' ability to adopt new technologies and improve productivity. However, 11.1% of farmers had no formal education, which may limit their access to information and resources critical for efficient farming.

The results in Table 1 indicate that the average household size was 6.72 members, with most households having between 6 and 10 members. Larger households can provide additional labor for farming activities, which is beneficial for labor-intensive practices such as small ruminant farming [18]. However, larger households also imply higher dependency ratios, which could strain household resources.

Additionally, the findings revealed that farmers had an average of 7.3 years of experience in small ruminant farming, with 42.6% having between 6 and 10 years of experience. Experience is a critical factor in farming efficiency and productivity, as it enhances farmers' knowledge and skills in livestock management [19]. The presence of relatively experienced farmers suggests a stable knowledge base within the community.

Moreover, the majority (79.6%) of the farmers were heads of their households. Being the head of a household often correlates with decision-making authority and responsibility, which can impact farming practices and resource allocation [20]. The study also found that only 10.2% of farmers considered small ruminant farming their main source of income. This suggests that small ruminant farming is largely a supplementary occupation rather than a primary livelihood source. This is consistent with findings, indicating that small-scale farming is often part of a diversified income strategy [21].

Lastly, the frequency of extension worker visits was generally low, with 37% of farmers reporting rare or no visits. Extension services are crucial for disseminating knowledge and improving farming practices, and the lack of frequent visits suggests a gap in agricultural support services [22]. Enhancing the frequency and quality of extension services could significantly benefit small ruminant farmers.

Table 1: Socio-Economic Characteristics of Small Ruminant Farmers

Variable	Frequency	Percent	Mean
Age (Years)			
16 – 30	10	9.3	
31 – 45	39	36.1	
46– 60	54	50.0	46.2
61 and above	5	4.6	
Sex of Farmers			
Male	89	82.4	
Female	19	17.6	
Marital Status			
Single	8	7.4	
Married	97	89.8	
Widow	3	2.8	
Educational Level of Farmers			
No Formal Education	12	11.1	
Primary Education	22	20.4	
Junior Secondary	0	0	
Senior Secondary	21	19.4	
ND/NCE	11	10.2	
HND/BSc and above	42	38.9	
Size of Household			
1 – 5	45	41.7	
6 – 10	52	48.1	6.72
11 – 15	7	6.5	
16 and above	4	3.7	
Small Ruminant Keeping Experience (Years)			
1 – 5	41	38.0	
6 – 10	46	42.6	7.3
11 – 15	17	15.7	
Above 15	4	3.7	
Head of Household			
Yes	86	79.6	
No	22	20.4	
Small Ruminant Farming as main Source of Income			
Yes	11	10.2	
No	97	89.8	
Frequency of Extension Workers Visit			
Very Frequent	8	7.4	
Frequent	20	18.5	
Rarely Frequent	40	37.0	
Not Frequent	40	37.0	

Source: Field survery, 2024.

Income from Small Ruminant Kept by Small Ruminant Farmers

Table 2 presents the income distribution across different types of small ruminant farming. The results indicate that sheep farming generally yields low to moderate income, with 63.0% of sheep farmers earning between N1 and N50,000. Only 3.7% of farmers earn above N250,000, highlighting the rarity of high earnings in this sector. The mean income of N76,111.11 reflects a generally modest earning level from this activity. This aligns with the study by which suggests that while sheep farming is beneficial due to the value of wool and meat, its profitability remains modest [23].

For goat farming, Income from goat farming is somewhat higher and more evenly distributed than sheep farming. Most (40.7%) of the farmers earn between N50,001 and N100,000, and few (2.8%) of the farmers earns above N250,000. The mean income from goat farming is slightly lower than that from sheep farming at N63,879.16. This indicates that while goat farming is prevalent, it does not necessarily translate into significantly higher earnings for most farmers. Goats are favored for their hardiness and multiple utility aspects, such as meat and milk production [24].

Table 2: Income from Small Ruminant Kept by Farmers (n=108)

Variable	Frequency	Percent	Mean
Income from Sheep farming in (Naira)			
1 – 50,000	68	63.0	
50,001 – 100,000	12	11.1	76.111.11
100,001 – 150,000	15	13.9	
150,001 – 200,000	7	6.4	
200,001 – 250,000	2	1.9	
Above 250,000	4	3.7	
Income from Goat farming in (Naira)			
1 – 50,000	48	44.4	
50,001 – 100,000	44	40.7	
100,001 – 150,000	10	9.3	63,879.16
150,001 – 200,000	3	2.8	
200,001 – 250,000	0	0	
Above 250,000	3	2.8	

Source: Field Survey, 2024.

ICT Tool Usage and Effectiveness Among Small Ruminant Farmers

ICT Tool Usage by Small Ruminant Farmers

The results presented in Table 3 revealed that radio was the most widely used ICT tool among the farmers, with 83.30% reporting usage. This high level of adoption can be attributed to the affordability, accessibility, and ease of use of radios, which do not require electricity or internet connectivity and can broadcast in local languages [25]. Similarly, mobile phones were the second most used ICT tool, with 92.60% of farmers utilizing them. The high adoption rate reflects the affordability, portability, and multifunctionality of mobile phones, which can be used for communication, accessing market information, and receiving extension services [26].

Television was also commonly used, with 73.10% of farmers utilizing it. Televisions provide visual and audio content that can be more engaging and informative, though their usage is slightly less than radios due to the need for electricity and the higher cost of TV sets [27]. Videos were used by 55.60% of farmers, making them a popular tool for accessing visual and demonstrative content. Videos can be an effective medium for training and education, offering step-by-step guides and demonstrations [28].

Other ICT tools had lower adoption rates. Computers were used by 25.90% of farmers, indicating limited access possibly due to high costs, the need for electricity, and the requirement for digital literacy [29]. Email usage was reported by 40.70% of farmers, likely due to limited internet access and digital literacy, though email can be a valuable tool for formal communication and accessing detailed information [30]. Satellite technology was used by 33.30% of farmers, indicating moderate adoption. Satellites can provide broad coverage and access to remote areas, though the costs and technical requirements may limit their usage [31].

Landline phones were rarely used, with only 3.70% of farmers reporting usage. This is likely due to the decline in landline infrastructure and the preference for mobile phones, which offer greater flexibility and coverage [32]. Projectors were also rarely used, with only 7.4% of farmers reporting usage. The high cost and need for technical skills likely limit their adoption despite their effectiveness in educational and training settings [33].

Effectiveness of ICT Tools Among Small Ruminant Farmers

The data presented in Table 3 indicate that radio and mobile phones are rated as the most effective ICT tools, with mean scores of 2.39 and 2.24, respectively. This suggests that small ruminant farmers generally perceive these tools as highly effective. The widespread accessibility of radio and its ability to quickly and broadly disseminate information contribute to its high rating [34]. Likewise, mobile phones serve as versatile communication tools, providing farmers with real-time updates, market prices, and other crucial agricultural information [35].

Additionally, television had a mean score of 2.17, signifying its effectiveness, though slightly lower than that of radio and mobile phones. Television delivers both visual and auditory information, making it engaging; however, rural accessibility issues such as inconsistent electricity and poor signal reception may limit its utility [36]. Videos, with a mean score of 1.78, are considered moderately effective. They provide detailed visual demonstrations that are particularly beneficial for training and education, but their effectiveness may be restricted by the need for suitable devices and internet access [37].

On the other hand, computers (mean score: 1.56), email (1.52), and satellite technology (1.47) received lower ratings, indicating they are less effective for small ruminant farmers. The limited effectiveness of computers and emails is likely due to low digital literacy and restricted internet access in many rural areas [38]. Although satellite communication holds potential, it may be perceived as complicated and less accessible for everyday use. Projectors (mean score: 1.28) and landline phones (1.12) were rated as the least effective ICT tools. Projectors are impractical for daily use due to their dependence on a stable power supply and complex setup, making them more suitable for occasional training rather than routine communication [39]. Landline phones, being outdated and offering limited functionality compared to mobile phones, received the lowest effectiveness rating.

Table 3: Usage and Effectiveness of ICT Tools by Small Ruminant Farmers

ICT Tool	Usage (%)	Mean Score	Effectiveness Decision
Mobile phone	92.60	2.24	Very Effective
Radio	83.30	2.39	Very Effective
Television	73.10	2.17	Very Effective
Video	55.60	1.78	Effective
Email	40.70	1.52	Effective
Satellite	33.30	1.47	Not Effective
Computer	25.90	1.56	Effective
Projector	7.40	1.28	Not Effective
Landline	3.70	1.12	Not Effective

Source: Field Survey, 2024.

Decision Rule: Very Effective (Mean score ≥ 2.00) | Effective (Mean score 1.50 – 1.99) | Not Effective (Mean score < 1.50).

Influence of Socio-Economic Characteristics on ICT Use by Small Ruminant Farmers

The results of Chi-Square analysis on the effect of socio-economic characteristics on ICT use by small ruminant farmers is presented in Table 4. The findings reveal that larger household sizes significantly influence the use of radio ($\chi^2 = 33.152$, $p = 0.003$), television ($\chi^2 = 25.933$, $p = 0.026$), mobile phones ($\chi^2 = 23.100$, $p = 0.059$), and email ($\chi^2 = 27.723$, $p = 0.015$). This influence may be attributed to the higher communication needs in larger families, making ICT tools essential for information dissemination and farm management. These findings align with findings of who suggested that larger households may also pool resources to acquire and maintain these technologies, thereby increasing their overall utility [25].

Higher income from small ruminant farming was significantly associated with increased use of various ICT tools, including radio ($\chi^2 = 45.063$, $p = 0.012$), television ($\chi^2 = 17.008$, $p = 0.049$), mobile phones ($\chi^2 = 43.756$, $p = 0.016$), computers ($\chi^2 = 39.525$, $p = 0.043$), projectors ($\chi^2 = 40.132$, $p = 0.015$), and videos ($\chi^2 = 41.936$, $p = 0.025$). This suggests that farmers with higher incomes are more likely to invest in a range of ICT tools to enhance their farming operations. Greater financial resources enable them to access and utilize advanced technologies, ultimately improving productivity and marketability [26].

The relationship between age and television use ($\chi^2 = 49.661$, $p = 0.051$) was marginally significant, suggesting that younger farmers may be more inclined to use television as an information source compared to older farmers. Younger farmers are generally more receptive to new technologies and prefer modern information channels, whereas older farmers may rely on traditional methods [27].

A higher level of education was significantly associated with increased use of television ($\chi^2 = 26.166$, $p = 0.036$), computers ($\chi^2 = 32.663$, $p = 0.005$), email ($\chi^2 = 32.242$, $p = 0.006$), and satellite ($\chi^2 = 25.861$, $p = 0.040$). Educated farmers are more likely to understand and appreciate the benefits of these technologies. They possess the necessary skills to operate advanced ICT tools and interpret the information provided, ultimately improving their farming practices [29].

Years of farming experience significantly influenced the use of television ($\chi^2 = 32.856$, $p = 0.017$), satellite ($\chi^2 = 32.368$, $p = 0.020$), and video ($\chi^2 = 35.303$, $p = 0.009$). Experienced farmers may seek to improve their methods by accessing diverse information sources. Their long-term engagement in farming increases their awareness of ICT benefits in gaining new insights and staying updated with agricultural advancements [28].

Moreover, the results in Table 4 revealed a significant relationship between gender and satellite use ($\chi^2 = 26.166$, $p = 0.036$), indicating that male farmers are more likely to use satellite technology than female farmers. This disparity could be attributed to socio-cultural factors and gender roles that affect access to and control over technology. Male farmers may have greater opportunities and resources to adopt advanced technologies [30].

Table 4: Influence of Socio-Economic Characteristics on ICT Use by Small Ruminant Farmers (Chi-Square Tests (Pearson))

Variables	Value	df	Asymp. Sig. (2-sided)
Radio			
Household size	33.152	14	.003
Income from Goat last year	45.063	26	.012
Television			
Age of Farmer	49.661	35	.051
Marital status of the farmer	5.091	2	.078
The respondent's household size	25.933	14	.026
Years spend schooling	26.166	15	.036
Number of years the respondents keep ruminant animals	32.856	18	.017
Income from sheep last year	32.986	23	.081
Income from Rabbit last year	17.008	9	.049
Mobile phone			
The respondent's household size	23.100	14	.059
Income from Goat last year	43.756	26	.016
Computer			
Years spend schooling	32.663	15	.005
Income from Goat last year	39.525	26	.043
Projector			
Income from sheep last year	40.132	23	.015
Email			
The respondent's household size	27.723	14	.015
Years spend schooling	32.242	15	.006
Satellite			
Sex of Farmers	5.397	1	.020
Years spend schooling	25.861	15	.040
Number of years the respondents keep ruminant animals	32.368	18	.020
Income from sheep last year	34.219	23	.062
Income from Rabbit last year	16.149	9	.064
Video			
Number of years the respondents keep ruminant animals	35.303	18	.009
Using Video as an ICT * Income from Goat last year	41.936	26	.025

Source: Field Survey, 2024.

Challenges Encountered by Small Ruminant Farmers in the Used of ICTs

As shown in Table 5, the results reveal that poor network service from providers is the most significant challenge, reported by 66.7% of respondents. This issue is critical as it directly affects the accessibility and reliability of ICTs, which are essential for modern farming practices. Financial constraints is another major issues, with 36.1% of farmers citing inadequate funds to purchase data. This limitation restricts their ability to access crucial agricultural information and services, ultimately hindering productivity and efficiency [26]. Additionally, 34.3% of the farmers identified inadequate power supply as a key issue. Reliable electricity is essential for the effective operation of ICT tools and its absence can significantly reduce the usability of these technologies in farming activities [40].

Table 5: Challenges Encountered by Small Ruminant Farmers in the Used of ICTs

Perceived Constraints	Frequency*	Percent
Poor Network from service providers	72	66.7
Inadequate Funds to Purchase Data	39	36.1
Inadequate Power Supply for ICTs	37	34.3

*** Multiple Response**
Source: Field Survey, 2024.

Test of Hypothesis

The data presented in Table 6 show the results of the null hypothesis (Ho) for this study, which states that there is no significant relationship between small ruminant farmers' household size and the socio-economic factors influencing their use of ICT tools. Correlation analysis was used to examine this relationship, and the results from Table 6 indicate several significant correlations at the 5% level. The analysis shows a positive correlation ($r = 0.212$, $p = 0.029$) between radio use and household size, suggesting that 21.2% of the variation in radio use is associated with household size. Larger households are more likely to use radios, likely due to shared access for information dissemination. Similarly, a positive correlation ($r = 0.291$, $p = 0.002$) was found between television use and household size, indicating that 29.1% of the variation in television use is linked to household size, leading to the rejection of the null hypothesis.

Conversely, a negative correlation ($r = -0.193$, $p = 0.046$) between landline phone use and household size suggests that 19.3% of the variation in landline usage is negatively associated with household size, reflecting a shift towards mobile phone adoption in larger households. Lastly, a positive correlation ($r = 0.314$, $p = 0.001$) was observed between email use and household size, indicating that 31.4% of the variation in email usage is influenced by household size. Since all correlations have p-values < 0.05, the null hypothesis is rejected in each case, confirming that household size significantly influences ICT tool usage among small ruminant farmers.

Table 6: Correlation (Pearson) between ICT Used and House size of Small Ruminant Farmers

Variables	Value	Asymp. Std. Errora	Approx. T[b]	Approx. Sig.
Radio				
Household size	.212	.139	2.218	.029
Television				
Household size	.291	.099	3.111	.002
Land line phone				
Household size	-.193	.167	-2.018	.046
Mobile phone				
Household size	.183	.163	1.906	.059
Email				
Household size	.314	.069	3.383	.001
Satellite TV				
Household size	.167	.075	1.740	.085

Source: Field Survey, 2024.

Conclusion

The findings of this study provide a clear understanding of the perceived effectiveness of different ICT tools among small ruminant farmers. The results suggest that interventions should prioritize enhancing access to and the functionality of radios and mobile phones, which are seen as the most effective tools. Conversely, the less effective tools, such as landlines and projectors, highlight areas where either their application needs rethinking or where newer technologies can provide better solutions. The socio-economic characteristics of small ruminant farmers significantly influence their use of various ICT tools. Education level, age, household size, income from small ruminant farming, and sex of farmers are key factors that affect how these farmers adopt and use ICT tools. These insights highlight the need for tailored ICT interventions that consider the diverse socio-economic backgrounds of farmers. By addressing these factors, policymakers and development agencies can enhance the effectiveness of ICT in improving small ruminant farming practices.

Recommendations

- Based on the findings of this study, the following recommendations are proposed:
- Government and NGOs should create more market opportunities for sheep and goat products could motivate more farmers to diversify their small ruminant farming activities.
- Government should make policies to increase accessibility of effective ICT tools and expand the use of radios and mobile phones by ensuring radios and mobile phones are affordable and should be provided with relevant content tailored to small ruminant farmers.
- Given the high demand for health information, extension services should enhance the accessibility and quality of health-related content. This could involve using various ICT tools like mobile phones and radio to disseminate timely and relevant health information.
- To support the small ruminant farmers interested in production

practices, it is essential to provide comprehensive and practical information using the ICT tools.

- Enhancing small ruminant farmers' education and technical skills can significantly improve their ability to use advanced ICT tools.

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