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Utilization pattern of ICTs among tribal livestock farmers of Telangana state

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Abstract

An *ex-post-facto* research design was followed in the present investigation for which 405 tribal livestock farmers of Mahabubabad, Adilabad, and Bhadrachari Kothagudem districts, were purposively selected, as they were districts which have significant tribal population in Telangana. The data pertaining to dependent variables viz. availability and accessibility of ICT tools, ICT utilization pattern and perception on ICT tools and independent variables were collected with the help of a pre-tested interview schedule developed for the purpose for assessing the utilization pattern of ICTs among tribal livestock farmers of Telangana state. The relational analysis revealed that availability of ICTs had a significant association with socio-economic status, herd size, economic orientation and information-seeking behavior. When examining accessibility of ICTs, there were positive and significant relationships with socio-economic status, herd size, knowledge on ICT tools, social participation, innovativeness, economic orientation, information-seeking behavior and achievement motivation. These factors collectively contribute to enhancing farmers' ability to access ICT resources. The utilization pattern of ICTs was significantly associated with a range of factors like socio-economic status, herd size, knowledge on ICT tools, social participation, innovativeness, self-confidence, economic orientation, achievement motivation and information-seeking behavior. Regarding perception of ICTs variables viz. socio-economic status, herd size, social participation, achievement motivation, knowledge on ICT tools, innovativeness, self-confidence, economic orientation and information-seeking behavior were significantly associated with perception of ICTs.

Keywords: ICTs, tribal population, livestock farmers, utilization pattern, Telangana region

Introduction

The livestock sector plays a vital role in supporting the socio-economic development of India's tribal communities. Telangana, a state with a significant tribal population, demonstrates a unique mix of agricultural tradition and underdeveloped infrastructure. Livestock remains a principal livelihood source, especially in tribal districts like Mahabubabad, Adilabad, and Bhadrachari Kothagudem. With the growth of digital agriculture and the proliferation of ICTs—such as mobile phones, internet-based advisory systems, and broadcast media—there lies a vast potential to enhance knowledge dissemination. However, for marginalized tribal farmers, ICTs remain underutilized due to structural, social, and psychological constraints. Limited connectivity, cost of devices, digital illiteracy, and lack of localized content form the major barriers. The present study

aims to assess the levels of availability and accessibility of ICTs among tribal livestock farmers and identify socio-personal and psychological determinants influencing ICT usage patterns. The findings would provide evidence for designing inclusive ICT-based interventions targeted at tribal farming communities.

Materials and Methods

An *ex-post-facto* research design was adopted. The study was conducted in the tribal-dominated districts of Mahabubabad, Adilabad, and Bhadrachari Kothagudem in Telangana. A multistage purposive random sampling technique was used. From each of the three districts, three mandals with high tribal populations were selected, followed by three villages per mandal. Fifteen tribal livestock farmers were randomly chosen from each village,

totaling 405 respondents. Primary data were collected using a structured interview schedule that included socio-personal variables (education, family type, landholding, income, etc.) and psychological variables (self-confidence, economic orientation, innovativeness, achievement motivation, etc.). The frequency of use of the identified ICT tools was measured by giving weightages of 3, 2, 1, 0 on four-point continuum viz., frequently, occasionally, rarely, and never, respectively. Further, the respondents were classified into low, medium and high categories by using the mean and standard deviation. The mean score for a particular ICT tool was worked out by dividing the weighted score of the ICT tool with the total number of respondents and ICTs were

ranked accordingly. These were measured by measured by adopting and applying a scale developed by Khamoushi (2014) ^[2] with modifications. Data analysis was performed using SPSS and MS Excel, employing descriptive statistics, mean and standard deviation classification, and Pearson's correlation for variable relationships.

Results and Discussion

1. ICT Utilization pattern

At a glance of Table 1 inferred that majority (63.21%) of the farmers had medium level of ICTs utilization pattern followed by high (20.99%) and rest (15.80%) of the farmers had low level of ICT utilization pattern.

Table 1: Distribution of respondents according to their ICT Utilisation pattern

S. No.	Category	Frequency(n=405)	Percentage
1	Low (<48)	64	15.80
2	Medium (49-89)	256	63.21
3	High (>90)	85	20.99
	Total	405	100.00
Mean=68.32		SD=20.51	

2. Item analysis of ICT utilisation pattern of the tribal livestock farmers

From the Table 2, it is evident that majority of the respondents (81.73%) used mobile phones frequently followed by occasionally (10.62%), 5.92 per cent rarely used 1.73 per cent never used mobile phones. The Table 02, revealed that only 21.73 per cent called SMSs frequently, 38.27 per cent occasionally called followed by 16.54 per cent rarely called and 23.46 per cent never called the subject matter specialist. About 52.59 per cent of respondents never called Kisan Call Centers, followed by 23.70 per cent who called occasionally, 13.58 per cent rarely, and 10.12 per cent

frequently, indicating limited engagement with this support service among the respondents. Majority of the respondents (48.15%) rarely used short message services followed by 20.25 per cent never used short message services, 19.01 per cent rarely used short message services and 12.59 per cent were frequently used short message services. Majority of the respondents (51.36%) occasionally used mobile apps while 20.74 per cent never, 14.57 per cent rarely and 13.33 per cent frequently used mobile apps. Nearly one- third of the respondents (33.09%) were frequently using social media followed by occasionally (26.91%), 22.96 per cent never and rest 17.04 per cent were rarely using social media.

Table 2: Item analysis of farmers according to their utilization pattern of mobile phones (n=405)

S. No	ICT Tools	Frequently		Occasionally		Rarely		Never	
		f	%	f	%	f	%	f	%
I	Mobile phones	331	81.73	43	10.62	24	5.92	7	1.7
1.	Calls to the subject matter specialists	88	21.73	155	38.27	67	16.54	95	23.46
2.	Kisan call centers	41	10.12	96	23.70	55	13.58	213	52.59
3.	Short message services (SMS)	51	12.59	77	19.01	195	48.15	82	20.25
4.	Mobile apps	54	13.33	208	51.36	59	14.57	84	20.74
5.	Social media	134	33.09	109	26.91	69	17.04	93	22.96

ICT utilization patterns are important for understanding how tribal livestock farmers integrate technology into their daily operations, allowing for more effective farm management and decision-making. At a glance of Table 01 inferred that majority (63.21%) of the farmers had medium level of ICTs utilization pattern followed by high (20.99%) and rest (15.80%) of the farmers had low level of ICT utilization pattern. The reason for this trend is increasing familiarity with ICT tools like mobile phones and televisions, which are widely accessible. While these tools are commonly used for communication and accessing general information, limitations such as lack of advanced training, inconsistent internet access, and cost barriers prevent many farmers from fully utilizing more sophisticated ICTs, such as online agricultural platforms or video conferencing. The results are in accordance with Sahu *et al.* (2023) ^[6], Madhuri *et al.*

(2021) ^[3] and Mishra (2015) ^[4] who reported that majority of the respondent farmers had medium ICT utilisation pattern. While the results are contrasting with Hasan *et al.* (2019) ^[1] Yadav *et al.* (2019) ^[7] Reddy (2016) ^[5] in which the respondents had less utilization of ICTs. Item analysis of ICT utilisation pattern of the tribal livestock farmers was studied and presented in the Tables 2, 3, 4, 5, 6 and 7. With regards to the mobile phones it was evident that majority of the respondents (81.73%) used mobile phones frequently followed by occasionally (10.62%) and 5.93 per cent rarely used them (Table 02). It could be considered the mobile phone are most available, accessible and affordable ICT tool. The services used in the mobile phones frequently used was the social media (33.09%) services like WhatsApp etc. from where they can obtain the information regarding the livestock farming. Majority of the farmers have opined

that, mobile apps (51.36%) and calls to subject matter specialists (38.27%) were occasionally used. Short message services (47.90%) were rarely used and Kisan call centers (52.59%) were never used ICT tools. By analyzing the results, it can be implied that the farmers use the mobile phone in their domestic life and same would be also used for the acquiring information regarding the livestock farming.

Table 3: The programs watched in the television regarding the livestock (n=405)

S. No.	ICT Tools	Frequently		Occasionally		Rarely		Never	
		f	%	f	%	f	%	f	%
II.	Television	233	57.53	40	9.88	44	10.86	88	21.73
1.	Farm broadcasts	88	21.73	96	23.70	79	19.51	141	34.81
2.	Live phone in programs	45	11.11	80	19.75	117	28.89	163	40.25

One-third of the respondents (34.81%) have never watched farm broadcasts followed by 23.70 per cent watched occasionally while, 21.73 per cent frequently watching farm broad casts and the rest 19.51 per cent rarely watched farm broadcasts programmes pertaining to livestock. Majority of the respondents (40.25%) have never watched live phones in programs followed by 28.89 per cent rarely, while 19.75 per cent occasionally and the rest 11.11 per cent frequently watched live phone in programs. From the Table 03, it is evident that about three-fourth of the respondents (78.77%) frequently watched televisions followed by 9.88 per cent occasionally, 8.64 per cent rarely and rest 2.72 per cent never watched televisions. From the results it is evident that the programmes related to the livestock like farm broadcasts (34.81%) or the live phone in programmes (40.25%) were never seen by major section of the respondents. Only around one fourth of the respondents were watching occasionally, the farm broadcasts' (23.70%) and live phone in programmes (40.25%) on the television. This pattern might

3. Utilisation of Television modules regarding the livestock

Table 3 demonstrated that about three-fourth of the respondents (57.53%) frequently watched televisions followed by 21.73 per cent never, 10.86 per cent rarely and rest 9.88 per cent occasionally watched television.

be observed as the most of the respondents were mostly watching the entertainment programmes on the television and also the farming programmes on the television were limited and also broadcasted at a particular time only.

4. Utilisation of Radio modules regarding the livestock

Perusal of Table 04, indicated that nearly three fourth of the respondents (71.85%) rarely listened to radio followed by 18.27 per cent respondents never listening, 5.44 per cent frequently listened and 4.44 per cent occasionally listened to radio. Majority of the respondents (51.36%) never listened FM/AM radio programs followed by 20.25 per cent were occasionally listening, 17.28 per cent were frequently listening and rest 11.11 per cent were rarely listening to FM/AM radio programs. Most of the respondents (53.58%) were never listening to phone in live programs followed by occasionally (20.49%), 14.57 per cent were rarely listening and rest 11.36 per cent were frequently listening phone in live in programs.

Table 4: The programs broadcasted in Radio regarding the livestock (n=405)

S. No	ICT Tools	Frequently		Occasionally		Rarely		Never	
		f	%	f	%	f	%	f	%
III.	Radio	22	5.44	18	4.44	291	71.85	74	18.27
1.	FM/AM Radio programs	70	17.28	82	20.25	45	11.11	208	51.36
2.	Phone in live programs	46	11.36	83	20.49	59	14.57	217	53.58

On perusal of Table 04, it could be concluded that the radio was rarely listened by the most of the respondents (71.85%). The programs of FM/AM Radio programs were (51.36%) never listened followed by 20.25 per cent were occasionally listening them. Phone in live programs also almost followed the same trend of more than half of the respondents (53.58%) were never listening phone in live programs followed by occasionally (20.49%) them. Majority of the respondents were (59.26%) never listening community radio followed by 16.79 per cent were occasionally listening the programme. These results might be observed as the radio is traditional ICT tool and it became obsolete in many of the households.

5. Utilisation of computers and multimedia modules regarding the livestock

Table 5, showed that half of the respondents (50.37%) were rarely used computers followed by 38.27 per cent who never used computer, while 6.17 per cent frequently used and 5.19 per cent occasionally used computers. The Table 05 also indicated that majority of the respondents (52.35%) were never used multimedia modules while (36.05%) rarely, (6.17%) frequently and 5.43 per cent occasionally used multimedia modules. Most of the respondents (60.74%) never used CD/DVDs, while 15.31 per cent occasionally used and 14.07 per cent rarely and 9.88 per cent frequently used CD/DVDs.

Table 5: Utilisation of computers and multimedia modules regarding the livestock (n=405)

S. No	ICT Tools	Frequently		Occasionally		Rarely		Never	
		f	%	f	%	f	%	f	%
IV	Computer	25	6.17	21	5.19	204	50.37	155	38.27
1.	Multimedia modules	25	6.17	22	5.43	146	36.05	212	52.35
2.	CD/DVDs	40	9.88	62	15.31	57	14.07	246	60.74

It observed from Table 5, that half of the respondents (50.37%) were rarely using computers followed by 38.02 per cent were never used, computers. The feature of the computer like multimedia modules (52.10%) and CD/DVDs (60.74%) were never used by more than half of the respondents. Only 36.05 per cent and 15.31 per cent of the respondents had rarely used the multimedia modules and CD/DVDs respectively. This scenario might be observed due to the availability, accessibility and affordability of the

farmer is less with regards to the computer as they require infrastructure an investment as well.

6. Utilisation pattern of Internet regarding the livestock

Table 6 indicated that more than half of the respondents (55.80%) were frequently using internet followed by 29.38 per cent who used internet occasionally, 9.14 per cent rarely used and 5.68 per cent never used internet.

Table 6: Utilisation pattern of Internet regarding the livestock (n=405)

S. No	ICT Tools	Frequently		Occasionally		Rarely		Never	
		f	%	f	%	f	%	f	%
V	Internet	226	55.80	119	29.38	37	9.14	23	5.68
i.	Network connectivity								
1.	Internet use by mobile phones	200	49.38	96	23.70	45	11.11	64	15.80
2.	Internet usage in home through laptop/desktop	36	8.89	57	14.07	63	15.56	249	61.48
3.	Internet usage is some other people's house in the village	60	14.81	63	15.56	58	14.32	224	55.31
ii.	Services used								
1.	Web portals	49	12.10	49	12.10	257	63.46	50	12.35
2.	Search engines	36	8.89	66	16.30	256	63.21	47	11.60
3.	e-books	21	5.19	51	12.59	56	13.83	277	68.40
4.	e-magazines	35	8.64	45	11.11	65	16.05	260	64.20
5.	Youtube	165	40.74	132	32.59	54	13.33	54	13.33

Nearly half of the respondents (49.38%) frequently used internet by mobile phones followed occasionally (23.70%), never (15.80%) and the rest (11.11%) rarely used internet by mobile phones. Majority of the respondents (61.48%) never used internet in home through laptop or desktop followed by 15.56 per cent rarely, 14.07 per cent and 8.89 per cent occasionally and frequently used internet in home through laptop or desktop respectively. More than half of the respondents (55.31%) were never using internet in some other people's house in the village followed by 15.56 per cent, 14.81 per cent and 14.32 per cent used occasionally, frequently and rarely internet in some other people's house in the village. Nearly two-third of the respondents (63.46%) rarely used web portals followed by 23.35 per cent who never used web portals, and 12.10 per cent occasionally used and 12.10 per cent frequently used web portals. Most of the respondents (63.21%) were rarely using search engines followed by 16.30 per cent who occasionally used search engines, while 11.60 per cent never used search engines and 8.89 per cent frequently used search engines. Majority of the respondents (68.40%) never used e-books followed by 13.83 per cent rarely used e-books, 12.59 per cent occasionally and rest 5.19 per cent were frequently used e-books. Majority of the respondents (68.40%) never used e-books followed by 13.83 per cent rarely used e-books, 12.59 per cent occasionally and rest 5.19 per cent were frequently used e-books. Majority of the respondents (64.20%) were never used e-magazines followed by 16.05 per cent rarely, 11.11 per cent and 8.64 per cent occasionally and frequently used e- magazines respectively. The internet (Table 06) was frequently used by more than half of the respondents (55.80%) followed by occasionally (29.38%), rarely (9.14%) and never (5.68%) used internet. With regards to the network connectivity, internet was used via mobile phones network by 49.38 per cent of the respondents. 61.48 per cent never used internet in home through laptop or desktop and more than half of the

respondents (55.31%) were never used internet in some other people's house in the village. This might be the farmers used to their area they could access network connectivity with mobile phones which is wireless rather than the wired network connectivity to the computer desktops or laptops. With regards to the services they used, most of the respondents (40.74%) were frequently using YouTube followed by 32.59 per cent were occasionally used it. However, services like web portals (63.46%) search engines (63.2%) rarely used and e-book (68.40%) and e-magazines (63.95%) were never used by majority of the respondents. This trend may be observed as the YouTube is used daily by the farmers for mainly entertainment, they also use the same for the livestock farming as well frequently. The services of web portals, search engines were used by the farmers whenever they required for getting the information regarding the livestock farming.

7. Utilisation pattern of other ICT Tools

Majority of the respondents (54.32%) never watched film shows/video film followed by 18.77 per cent rarely watched, 15.80 per cent and 11.11 per cent occasionally and frequently watched film shows or video film pertaining to livestock information, respectively. More than one third of the respondents (38.27%) never used video conference followed by 27.16 per cent who occasionally used video conference, while 20.74 per cent were rarely using video conference and rest (13.83%) were frequently using video conference. Majority of the respondents (39.01%) never used audio conference followed by 22.72 per cent rarely 20.74 per cent occasionally and 17.53 per cent frequently used audio conference. Above Table indicated that majority of the respondents (52.35%) were never used multimedia modules while (36.05%) rarely, (6.17%) frequently and 5.43 per cent occasionally used multimedia modules. Most of the respondents (60.74%) never used CD/DVDs, while 15.31 per cent occasionally used and 14.07 per cent rarely and

9.88 per cent frequently used. Majority of the respondents (29.14%) never used digital camera followed by frequently

used (25.68%), then rarely (22.96%) and 22.22 per cent were occasionally used digital camera.

Table 7: Utilisation pattern of other ICT Tools (n=405)

S. No	ICT Tools	Frequently		Occasionally		Rarely		Never	
		f	%	f	%	f	%	f	%
1.	Film shows/video Film	45	11.11	64	15.80	76	18.77	220	54.32
2.	Videoconferencing	56	13.83	110	27.16	84	20.74	155	38.27
3.	Audio conferencing	71	17.53	84	20.74	92	22.72	158	39.01
4.	Digital camera	104	25.68	90	22.22	93	22.96	118	29.14
5.	Video camera	108	26.67	74	18.27	78	19.26	145	35.80
6.	Expert systems	34	8.40	58	14.32	74	18.27	239	59.01
7.	Information kiosks	19	4.69	65	16.05	64	15.80	257	63.46

Majority of the respondents (35.80%) never used video camera followed by 26.67 per cent respondents frequently used video camera, 19.26 per cent rarely used video camera and rest 18.27 per cent were occasionally used video camera. More than half of the respondents (59.01%) never used expert systems, 18.27 per cent used rarely, 14.32 per cent occasionally used and 8.40 per cent frequently used expert systems. Nearly about two thirds of the of the respondents (63.46%) never used information kiosks followed by 16.05 per cent who used occasionally, 15.80 per cent rarely and 4.69 per cent frequently used information kiosks. The other ICTs like film show or video film, (54.32%), video conferencing, (38.27%), audio conferencing (39.01%), digital camera (29.14%), video camera (35.80%), expert systems (59.01%), information kiosk (63.46%) were never used by majority of the tribal livestock farmers (Table 07). This pattern might be observed because these technologies were most recent ones and they may not be available at the tribal areas. So, due to less access to these advanced technologies the most of the respondents may not have used these technologies. The farmers who used these technologies may had good contact with the change agents.

Conclusion

The present study concluded that the majority (63.21%) of the tribal livestock farmers had medium level of ICTs utilization pattern followed by high (20.99%) and low (15.80%) of ICT utilization pattern. The majority of tribal livestock farmers frequently used mobile phones (81.73%) and watched television (78.77%). Radios were rarely used by most respondents (71.85%), and half of the respondents (50.37%) rarely used computers. More than half (55.80%) frequently accessed the internet, while other ICT tools, such as film shows (54.32%), video conferencing (38.27%), audio conferencing (39.01%), digital and video cameras (29.14% and 35.80%, respectively), expert systems (59.01%), and information kiosks (63.46%), were never used by most respondents.

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