

## Quantitative Comparison of Use of ICTs between Extension Field Staff and Dairy Farmers for the Adoption of Dairy Animal's Production Practices in the Punjab, Pakistan

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### ABSTRACT

Present study was aimed to find out the difference regarding utilization of information and communication technologies (ICTs) between extension field staff (EFS) and dairy farmers. The study was carried out on 156 EFS members (APVOs, DDL, SVOs, VO, VAs) by using proportionate sampling technique and 383 dairy farmers were selected randomly from Sheikhpura (Punjab), Pakistan. Data were collected through structured interview schedule. The study revealed that Duniya newspaper and Mawaishi Nama Magazine was frequently used by all EFS. While, Express newspaper and Zarat Nama were read by 48 and 30.5% of farmers respectively. T.V program Haryali and radio program JithayTere Hal Wagday were listened by 11.5 and 17.3% EFS, respectively. However, no farmer listened any T.V and radio program. Livestock Helplines including 08000-9211, 0800-78685, 0800-78686 were used by 92.9% EFS while agricultural helplines 0800 29000, 0800 15000 were used by 32.4% of farmers as top users. Mobile application of Livestock and Dairy Development Board was used by 48.1% EFS but its use was nil. Online browsing via [www.livestockpunjab.gov.pk](http://www.livestockpunjab.gov.pk) website was maximum visited by 80.1% EFS and 9.9% farmers. In the category of social media, WhatsApp was used by 92.9% EFS and 40.5% farmers were also used as ICT tool. Majority of the EFS used maximum extension methods to disseminate information among dairy farmers while phone call and visit of animal market were prominent extension methods to get information by using them.

**Keywords:** Livestock Extension Services, Public Sector, ICTs, Teaching Methods

### INTRODUCTION

Livestock is the large and major stakeholder of agriculture sector. Its sharing in overall agriculture is 61.9 percent and in GDP is 14.0 percent. Its value addition has increased 3.26 percent from last year. Livestock sector playing a vital role in foreign exchange earning with round bound 3.1 percent contribution to the total export of the country. It also provides source of income to 35-40 percent to rural people. More than 8 million rural families are engaged with this occupation to fulfil their daily needs and food supplements originated

by animal protein. In spite of good growth in livestock sector, it is unable to attract large investment due to traditional trend (Govt. of Pak.,2021-22).

World globally connected by information technology (IT) through which lifestyle is changed now. Now a days, IT sector covered approximately all field of life. Agriculture and livestock sector also influenced by this modern and fast technology and in presently, share of IT in agriculture is only 1.3% (Chargotra, 2006). ICTs is very important in improving livestock farming. It is fact that human population is increasing but livestock productivity is not increasing at the same pace. There are so many reasons of low livestock productivity but a leading factor is unawareness regarding latest techniques and technologies aimed to enhanced productivity. ICT provides livestock farmers with latest livestock farming technologies (Williams and Agbo, 2013). Previous researches have shown that ICT is a major contributing factor for improving livestock farming (Williams and Soremi, 2015). Local communities or farmers need to take part in decision making during the design and introduction of new ICT systems. Participation of livestock keepers is found to be the most effective way for successful ICT usage in farming (Angello, 2015).

ICTs have been introduced in livestock projects which have furnished fruitful results in livestock development. Information, rewarded with success stories can motivate human to adopt healthy livestock technologies. For instance, information on immunization, calf mortality, maternal mortality, sanitation, nutritional awareness and causes, prevention and treatment of diseases can be disseminated far and wide via ICTs. The enhanced and smooth communication results in the overall uplift of the livestock sector (Saravanan, 2010). The role of ICT cannot be minimized because it is a set of various old and modern tools that create, disseminate, store, improve the content and manage the information which is delivered to progressive competitive sector. Owing to this modern mode of transmission, technology is delivered among livestock farmers with suitable and proper tools to compete with international livestock requirements. At present, the gap between change agent and farmer is very huge and many programs run by public and private sector are very slow and ineffective (Kumar, 2005). Due to inadequate use of ICT in different development projects, the link between researchers, extension agents and farmers are also vast and this ratio is increasing day by day. It is admitted that ICT used for analyzing information and knowledge gap among farmers (Anandajayasekeramet *al.*, 2008). There is a dire need to wide use of latest ICT to

decrease gap among researchers, change agents and farmers to disseminate information in a befitting manner (Mcnamara, 2009). In agricultural extension, ICT has a lot of potential to aware the farmers in different context. Fast spreading of innovation and getting the feedback from researchers and farmers is one of the serious steps to increase the productivity of animals and also empower the dairy farmers about better production practices. The gap between researchers and dairy farmers can be overcome to strengthen the ICT use and potential. After revolution in IT sector, dairy farmers empowered through integration of ICT with agriculture and rural development (Aker, 2010).

In developing regions, it is very important to discuss about infrastructure of ICTs. ICT has broad spectrum and many components are included in this field like devices for diffusion of knowledge, dissemination processes, communication and network services that transmit content of technology. Keeping in view the above-mentioned fact, the present study was carried out with an aim to compare the use of ICTs between extension field staff and dairy farmers for the adoption of dairy animal's production practices in Punjab, Pakistan.

## **METHODOLOGY**

Study was purposively conducted in district Sheikhpura, province Punjab of Pakistan. According to animal census 2006, Sheikhpura district was reported rich in livestock sector. Majority of the farmers having buffaloes and cattle for dairy and meat production. In this district, 1,69,896 households having buffalo and cattle as a sample frame of this study. In this research primary data were collected with survey method by using observation, interview and questionnaire. According to [www.surveysystem.com](http://www.surveysystem.com), total sample size of dairy livestock farmers was 383. On other hand, 185 was the sample frame of livestock extension field staff (EFS) including Additional Principle Veterinary Officers (APVOs), Deputy Director Livestock (DDL), Senior Veterinary Officers (SVOs), Veterinary Officers (VOs) and Veterinary Assistants (VAs) of the district Sheikhpura. 156 is the total sample size of the EFS. Simple random sampling technique was used to collect data from dairy farmers and proportionate sampling technique was used to collect data

from EFS. Two well-structured and well-defined questionnaires were prepared separately with livestock expert's consultation. Statistical software was used to analyze collected information.

## **RESULTS AND DISCUSSION**

### **Newspapers and Magazines as ICT**

Messages related to agriculture and livestock are conveyed to the farmers and all other concerned persons through mass media especially print media. Print media such as newspapers and magazines are widely used by common man in far areas and it is very old way of dissemination of knowledge. However, due to the invasion of latest technologies trend of information flow is changing day by day. Print media has significant role to disseminate knowledge among farmers community (Olowu and Oyedokun 2000).

**Table 1. Utility percentage and extent of utilization of extension field staff (EFS) and farmers on the basis of essential newspapers and magazines as ICT tools**

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Extension Field Staff				Variables		Farmers						
Utility		Extent of Utilization		Mean (X <sub>1</sub> )	W. Score	Different ICT tools	Extent of Utilization		Utility			
Yes	No						W. Score	Mean (X <sub>2</sub> )	Yes		No	
F	%	F	%					F	%	F	%	
0	0	156	100	0	0	Asaas (Daily)	0	0	0	0	383	100
66	42.3	90	57.7	0.66	104	Pakistan (Daily)	241	0.62	131	34.2	252	65.8
0	0	156	100	0	0	Kissan Wing (Monthly)	0	0	0	0	383	100
0	0	156	100	0	0	RehbarKissan (Weekly)	0	0	0	0	383	100
156	100	0	0	2.76	432	Duniya (Daily)	494	1.28	168	43.9	215	56.1
63	40.4	93	59.6	0.86	135	Khabrain (Daily)	321	0.83	154	41	229	59
101	64.7	55	35.3	2.00	312	Jhang (Daily)	499	1.30	176	46	207	54
123	78.7	33	21.3	2.32	362	Express (Daily)	573	1.49	184	48	199	52
45	28.8	111	71.2	0.84	132	Dawn (Daily)	84	0.21	39	10.2	344	89.8
15	9.6	141	90.4	0.19	30	The News (Daily)	32	0.08	24	6.3	359	93.7
21	13.5	135	86.5	0.26	42	Dairy News and views	16	0.04	8	2.1	375	97.9
<b>Magazines</b>												
73	46.8	83	53.2	0.99	155	Zarat Nama	311	0.81	117	30.5	266	59.5
9	5.8	147	94.2	0.13	21	Zarai Digest	0	0	0	0	383	100
0	0	156	100	0	0	Kissan World	0	0	0	0	383	100
156	100	0	0	3.11	486	Mawaishi Nama	0	0	0	0	383	100
0	0	156	100	0	0	KissanRisala	0	0	0	0	383	100

0	0	156	100	0	0	Veterinary Doctor	0	0	0	0	383	100
0	0	156	100	0	0	Professional Times	0	0	0	0	383	100
0	0	156	100	0	0	NidayeKissan	0	0	0	0	383	100
156	100	0	0	3.23	505	Booklets/ brochures	234	0.61	93	24.3	290	75.7

**Scale:** 1=Very low, 2=Low, 3=Medium, 4=High, 5=Very high

**W.S:** Weighted Score

### Newspapers

All (100%) of the respondents of EFS with extent of use mean value  $X_1=2.76$  were read Duniya newspaper and know about any latest information related to dairy livestock. Though, less than half (43.9%) of farmers were read this daily newspaper to aware about dairy animal's production practices with extent mean value  $X_2=1.28$ . Good and simple majority (78.7 and 64.7%) of the respondents of EFS were read daily Express and Jhang with their extent values  $X_1=2.32$  and 2.00 respectively. Whereas, less than half (48 and 46%) of farmers were read out these daily newspapers with their extent mean values  $X_2=1.49$  and 1.30 respectively.

Less than half (42.3 and 40.0%) of Livestock Extension Field Staff was read daily Pakistan and Khabrain with extent mean values  $X_1=0.66$  and 0.86 respectively. While, 34.2 and 41% of farmers were read these daily newspapers with their extent mean values  $X_2=0.62$  and 0.83 respectively.

28.8, 13.5 and only 9.6% of the respondents of EFS were read daily Dawn, weekly Dairy News and views and daily The News with their extent mean values  $X_1=0.84$ , 0.26 and 0.19 respectively. However, 10.2, 2.1 and 6.1% of farmers were read these newspapers with their extent mean values 0.21, 0.04 and 0.08 respectively. Daily Asaas, monthly Kissan Wing and weekly RehbarKissan were not read and used by any single livestock extension field member and farmer.

### Magazines

All (100%) of the respondents from EFS side were read Mawaishi Nama and Booklets/Brochures with their extent mean values  $X_1=3.11$  and  $3.23$  respectively. While, less than one fourth (24.3%) of the farmers were read Booklets/ Brochures with extent mean value  $X_2=0.61$ . No any farmer was read and bought Mawaishi Nama.

Less than half and few (46.8 and 5.8%) of the respondents of EFS were used Zarat Nama and Zarai Digest with their extent mean values  $X_1=0.99$  and  $0.13$  respectively. Whereas, 30.5% of the farmers were used Zarat Nama with extent mean value  $X_2=0.81$ . No anyone used the Zarai Digest in farmer's case.

No any respondent from both side (EFS and dairy farmers) was used Kissan World, KissanRisala, Veterinary Doctor, Professional Time and NidayeKissan to get information related dairy livestock animals (Table 1).

The overall results of these ICT tools are mismatched from those of Subhashsinghet *al.* (2010) who perceived that more than one tenth (11.50%) of the respondents were used magazines and only 5.50% of livestock keepers read Newspaper for their agricultural information.

### Use of T.V and Radio

Radio and television playing a significant role in revolutionized communication processes to disseminate the information among all sectors related to agriculture (Jannat, 2018). Various TV and radio programs are launched to educate the farmers about latest technologies of agriculture which are mentioned in Table 2.

**Table 2. Utility percentage and extent of utilization of extension field staff (EFS) and farmers on the basis of essential agricultural T.V and radio programs as ICT tools**

Extension Field Staff	Variables	Farmers
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Utility				Extent of Utilization		Different ICT tools	Extent of Utilization		Utility			
Yes		No		Mean (X <sub>1</sub> )	W. Score		W. Score	Mean (X <sub>2</sub> )	Yes		No	
F	%	F	%					F	%	F	%	
<b>TV. Programs</b>												
0	0	156	100	0	0	Apna KissanApniZarat	0	0	0	0	383	100
0	0	156	100	0	0	Khait Punjab Day	0	0	0	0	383	100
0	0	156	100	0	0	Kissan Time	0	0	0	0	383	100
18	11.5	138	88.5	0.34	54	Haryali	0	0	0	0	383	100
0	0	156	100	0	0	Zarkhaiz	0	0	0	0	383	100
0	0	156	100	0	0	ZaraiPindal	0	0	0	0	383	100
0	0	156	100	0	0	Sarsabz Pakistan	0	0	0	0	383	100
<b>Radio Programs</b>												
13	8.3	143	91.7	0.16	26	KhaitKhaitHaryali	0	0	0	0	383	100
27	17.3	129	82.7	0.21	33	JithayTere Hal Wagday	0	0	0	0	383	100
0	0	156	100	0	0	SandhalDharti	0	0	0	0	383	100
0	0	156	100	0	0	UtumKhaiti	0	0	0	0	383	100
0	0	156	100	0	0	WasnayRehan Gran	0	0	0	0	383	100
0	0	156	100	0	0	Dharti Bakht Bahar	0	0	0	0	383	100
0	0	156	100	0	0	Sajri Rut	0	0	0	0	383	100
0	0	156	100	0	0	FM-100.4	0	0	0	0	383	100

**Scale:** 1=Very low, 2=Low, 3=Medium, 4=High, 5=Very high



**WS: Weighted Score**

More than one tenth (11.5%) of the respondents of EFS were watched Haryali T.V program with its extent mean value  $X_1=0.34$ .

Less than one tenth (8.3%) of the respondents of EFS were watched KhaitKhaitHaryali radio program with mean value  $X_1=0.16$ .

However, less than one fifth (17.3%) of the respondents of farmers were watched JithayTere Hal Wagday with its extent mean value  $X_1=0.21$ .

While, no anyone farmer was not watch any T.V and radio program to get information related to dairy production practices (table 2).

The results of these variable are differing from those of Lekopanye and K. (2017) who explained that 40% of the respondents watched T.V related to livestock information while 71% livestock keepers listened radio programs to update their knowledge.

**Helplines as ICTs**

Along with print, electronic and mass media telephone calls playing a significant role to motivate the farmers to solve their problems regarding agriculture and livestock. Farmers get information about any innovation and discuss their issues in detail to enhance their productivity (Khan, 2007). There are some prominent helplines to get information about dairy production technologies in Table 3.

**Table 3. Utility percentage and extent of utilization of extension field staff (EFS) and farmers on the basis of essential agricultural helplines as ICT tool**

Extension Field Staff				Variables		Farmers			
Utility		Extent of Utilization		Different ICT Tools	Extent of Utilization		Utility		
Yes	No	Mean (X <sub>1</sub> )	W. Score	Helplines	W. Score	Mean (X <sub>2</sub> )	Yes	No	
F	%	F	%				F	%	

92	59	64	41	1.66	259	1- 0800 29000, 0800 15000 (Agricultural Extension, Govt. of Punjab)	225	0.58	124	32.4	259	67.6
0	0	156	100	0	0	2-0800-17000 Agri-Consultancy Centre	0	0	0	0	383	100
0	0	156	100	0	0	3- 0800-84420 (PARC)	0	0	0	0	383	100
145	92.9	11	7.1	3.22	503	4- 08000-9211, 0800- 78685, 0800-78686 (Department of Livestock and dairy development)	130	0.33	62	16.2	321	83.8
0	0	156	100	0	0	5- 0303-0300000 (Jazz Bakhabar)	0	0	0	0	383	100
0	0	156	100	0	0	6- 700 (U-Kissan helpline)	0	0	0	0	383	100
0	0	156	100	0	0	7- 7272 (Telenor)	0	0	0	0	383	100
0	0	156	100	0	0	8- 700 (ZongKissan Portal)	0	0	0	0	383	100
0	0	156	100	0	0	9- FAA-Pakistan	0	0	0	0	383	100
0	0	156	100	0	0	10- Dairy Care Pakistan	0	0	0	0	383	100
0	0	156	100	0	0	11- Noble Deeds Foundation Islamabad	0	0	0	0	383	100
9	5.8	147	94.2	0.13	21	12- Agriculture SMS service: 0304- 4000172	0	0	0	0	383	100

**Scale:** 1=Very low, 2=Low, 3=Medium, 4=High, 5=Very high

**WS:** Weighted Score

Overwhelming majority (92.9%) of the respondents of EFS were used 08000-9211, 0800-78685, 0800-78686 (Department of Livestock and dairy development) with its extent mean value  $X_1=3.22$ . While, less than one fifth (16.2%) of the respondents of farmers were used said helpline to solve their Problems and aware about any type of innovation related to dairy livestock with its extent mean value  $X_2=0.33$ .

However, simple majority (59%) of the respondents of EFS were used 0800 29000, 0800 15000 (Agricultural Extension, Govt. of Punjab) helpline to increase their knowledge with extent mean value  $X_1=1.66$ . on other side, less than one third (32.4%) of the respondents of farmers were used this helpline with its extent mean value  $X_2=0.58$ .

Only 5.8% of the livestock extension field staff was used "Agricultural SMS service: 0304-4000172" SMS number with its extent mean value  $X_1=0.13$  and get maximum benefits. While, a single farmer was not using this service. Data also reveal that other helplines were not used by any extension field staff personnel and farmer (table 3).

### Use of Mobile Applications as ICTs

In modern era of farming, latest technologies are used to get information related to agriculture and livestock. There are hundreds of mobile applications are available to disseminate the knowledge and updated information regarding different activities of agriculture and dairy sector (EMarketer, 2016). In past, agricultural information was spread through traditional communication methods. Some familiar mobile applications related to agriculture and livestock are presented in Table 4.

**Table 4. Utility percentage and extent of utilization of extension field staff (EFS) and farmers on the basis of essential mobile applications as an ICT tools**

Extension Field Staff		Variables		Farmers	
Utility		Extent of Utilization		Extent of Utilization	
Yes	No	Mean ( $X_1$ )	W. Score	W. Score	Mean ( $X_2$ )
			Different ICT tools		
			Mobile Application		
				Yes	No

F	%	F	%					F	%	F	%	
15	9.6	141	90.4	0.26	42	AMIS Punjab	0	0	0	0	383	100
75	48.1	81	51.9	1.62	254	Livestock & Dairy Development Board	0	0	0	0	383	100
0	0	156	100	0	0	MeraMaweshi	0	0	0	0	383	100
38	24.4	118	75.6	0.40	63	Punjab Citizen Portal	0	0	0	0	383	100
95	60.9	61	39.1	1.08	169	Pakistan Citizen Portal	0	0	0	0	383	100
0	0	156	100	0	0	E-Kissan Pakistan	0	0	0	0	383	100
0	0	156	100	0	0	Kissan Dost	0	0	0	0	383	100
0	0	156	100	0	0	KissanSahulat	0	0	0	0	383	100
0	0	156	100	0	0	Agri Smart	0	0	0	0	383	100
06	3.8	150	96.2	0.05	9	Kissan Bazaar	0	0	0	0	383	100
0	0	156	100	0	0	KissanZar Zameen	0	0	0	0	383	100
3	1.9	153	98.1	0.019	3	Qeemat Punjab	0	0	0	0	383	100
0	0	156	100	0	0	Agriculture for Nutrition	0	0	0	0	383	100
3	1.9	153	98.1	0.019	3	Fertilizer Calculator (UAF)	0	0	0	0	383	100
0	0	156	100	0	0	UAF Plant Clinic	0	0	0	0	383	100
0	0	156	100	0	0	UAF Animal Clinic	0	0	0	0	383	100
0	0	156	100	0	0	Jazz BakhabarKissan-Digital Hub for Agriculture	0	0	0	0	383	100
0	0	156	100	0	0	Kitabcha (Bayer)	0	0	0	0	383	100
0	0	156	100	0	0	Sun-crop Guide	0	0	0	0	383	100

**Scale:** 1=Very low, 2=Low, 3=Medium, 4=High, 5=Very high

**WS:** Weighted Score

Less than one tenth (9.6, 3.8, 1.9 and 1.9%) of the respondents of EFS used AMIS Punjab, Kissan Bazar, Qeemat Punjab and Fertilizer Calculator (UAF) applications with their mean values  $X_1=0.26, 0.05, 0.01$  and  $0.01$  respectively. However, less than half (48.1%) and less than one fourth (24.4%) of the respondents were used Livestock & Dairy Development Board and Punjab Citizen Portal applications to attain desirable information about livestock with their extent mean values  $X_1=1.62$  and  $0.40$  respectively. Simple majority (60.9%) of the respondents of EFS were used Pakistan Citizen Portal application.

In farmer's category of the respondents, they were not use any application to increase their knowledge and aware latest animal's production practices (table 4).

The results of this research related to use of mobile application are dissimilar to those of Belakeriat *al.* (2017) who declared that mobile applications are emerging technology to create awareness among livestock stakeholders and revolutionize the livestock farming in modern context. These technologies will be the great assistance to the human resource of the livestock extension system.

**Use of websites**

In modern era, internet provides web-based extension services to farmers in the form of e-Agriculture, cyber extension and e-extension. Cyber extension updates the knowledge of rural people and farmers through computer and internet interaction (Sharma, 2003).

There are some prominent websites through which information provided to desired farmers in Table 5.

**Table 5. Utility percentage and extent of utilization of extension field staff (EFS) and farmers on the basis of essential agricultural websites as ICT tools**

Extension Field Staff		Variables	Farmers	
Utility	Extent of Utilization	Different ICT Tools	Extent of Utilization	Utility

						Websites							
Yes		No		Mean (X <sub>1</sub> )	W. Score		W. Score	Mean (X <sub>2</sub> )	Yes		No		
F	%	F	%						F	%	F	%	
125	80.1	31	19.9	2.87	449	<a href="http://www.livestockpunjab.gov.pk">www.livestockpunjab.gov.pk</a>	83	0.21	38	9.9	345	90.1	
77	49.4	79	50.6	1.03	161	<a href="http://www.agriculture.pk">www.agriculture.pk</a>	7	0.01	15	3.9	368	96.1	
12	7.7	144	92.3	0.10	16	<a href="http://www.kissandost.pk">www.kissandost.pk</a>	0	0	0	0	383	100	
91	58.3	65	41.7	1.58	248	<a href="http://www.pakdairinfo.com">www.pakdairinfo.com</a>	0	0	0	0	383	100	
97	62.2	59	37.8	1.98	310	<a href="http://www.lddb.org.pk">www.lddb.org.pk</a>	23	0.06	15	3.9	368	96.1	
66	42.3	90	57.7	1.17	184	<a href="http://www.dairyfarmingpakistan.com">www.dairyfarmingpakistan.com</a>	0	0	0	0	383	100	
45	28.8	111	71.2	1.01	159	<a href="http://www.dairyproject.org.pk">www.dairyproject.org.pk</a>	0	0	0	0	383	100	
0	0	156	100	0	0	<a href="http://www.zaraimedia.com">www.zaraimedia.com</a>	0	0	0	0	383	100	
6	3.8	150	96.2	0.09	15	<a href="http://www.parc.gov.pk">www.parc.gov.pk</a>	0	0	0	0	383	100	
15	9.6	141	90.4	0.19	30	<a href="http://www.agriportal.lmkt.com">www.agriportal.lmkt.com</a>	0	0	0	0	383	100	
6	3.8	150	96.2	0.07	12	<a href="http://www.agricorner.com">www.agricorner.com</a>	0	0	0	0	383	100	
3	1.9	153	98.1	0.01	3	<a href="http://www.agrifobank.com.pk">www.agrifobank.com.pk</a>	0	0	0	0	383	100	
3	1.9	153	98.1	0.03	6	<a href="http://www.pakissan.com">www.pakissan.com</a>	0	0	0	0	383	100	
33	21.2	123	78.8	0.57	90	<a href="http://www.amis.pk">www.amis.pk</a>	0	0	0	0	383	100	
0	0	156	100	0	0	<a href="http://www.par.com.pk">www.par.com.pk</a>	0	0	0	0	383	100	
0	0	156	100	0	0	<a href="http://www.agrihunt.com">www.agrihunt.com</a>	0	0	0	0	383	100	
15	9.6	141	90.4	0.21	33	<a href="http://www.pda.com.pk">www.pda.com.pk</a>	0	0	0	0	383	100	
52	33.3	104	66.7	0.90	141	<a href="http://www.uaf.edu.pk">www.uaf.edu.pk</a>	22	0.05	14	3.7	369	96.3	
76	48.7	80	51.3	1.02	188	<a href="http://www.uvas.edu.pk">www.uvas.edu.pk</a>	30	0.07	14	3.7	369	96.3	
3	1.9	153	98.1	0.01	3	<a href="http://www.uar.edu.pk">www.uar.edu.pk</a>	6	0.01	6	1.6	377	98.4	

0	0	156	100	0	0	<a href="http://www.ztbl.com.pk">www.ztbl.com.pk</a>	6	0.01	6	1.6	377	98.4
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**Scale:** 1=Very low, 2=Low, 3=Medium, 4=High, 5=Very high

**WS:** Weighted Score

Great majority (80.1%) of the respondents of EFS were used website [www.livestockpunjab.gov.pk](http://www.livestockpunjab.gov.pk) with extent mean value  $X_1=2.87$  to update their knowledge. While, only 9.9% of the farmers were search this website to gain information.

However, less than half (49.4, 48.7 and 42.3%) of the respondents of EFS were visited [www.agriculture.pk](http://www.agriculture.pk), [www.uvas.edu.pk](http://www.uvas.edu.pk) and [www.dairyfarmingpakistan.com](http://www.dairyfarmingpakistan.com) with their extent mean values  $X_1=1.03$ , 1.02 and 1.17 respectively. But only 3.9, 3.7 and 0% of farmers were used these sites with their extent mean values  $X_2=0.01$ , 0.07 and 0 respectively to improve their knowledge.

Majority (62.2%) of Extension field staff was visited [www.lddb.org.pk](http://www.lddb.org.pk) website with its extent mean value  $X_1=1.98$  and other side, only 3.9% of farmers were used this website with its extent mean value  $X_2=0.06$ .

58.3% of the respondents of EFS were searched website [www.pakdairinfo.com](http://www.pakdairinfo.com) with extent mean value  $X_1=1.58$ . But there was no farmer to use this website.

Less than one tenth (7.7, 3.8, 9.6, 3.8, 1.9, 1.9, 9.6 and 1.9%) of the respondents were used [www.kissandost.pk](http://www.kissandost.pk), [www.parc.gov.pk](http://www.parc.gov.pk), [www.agriportal.lmkt.com](http://www.agriportal.lmkt.com), [www.agricorner.com](http://www.agricorner.com), [www.agrinforbank.com.pk](http://www.agrinforbank.com.pk), [www.pakissan.com](http://www.pakissan.com), [www.pda.com.pk](http://www.pda.com.pk) and [www.uaar.edu.pk](http://www.uaar.edu.pk) websites with their use of extent mean values  $X_1=0.10$ , 0.09, 0.19, 0.07, 0.01, 0.03, 0.21 and 0.01 to adopt latest technologies related to dairy livestock respectively.

At the farmers end, only [www.uaar.edu.pk](http://www.uaar.edu.pk) website was visited by few (1.6%) farmers with extent mean value  $X_2=0.01$ .

Data also reveal that one third and less than one third (33.3 and 28.8%) of the respondents of EFS were used [www.uaf.edu.pk](http://www.uaf.edu.pk) and [www.dairyproject.org.pk](http://www.dairyproject.org.pk) with their utilization extent mean values  $X_1=0.90$  and 1.01 respectively. While, only 3.7% of farmers were used [www.uaf.edu.pk](http://www.uaf.edu.pk) with its extent mean value  $X_2=0.05$ .

More than one fifth (21.2%) of the respondents from EFS were used [www.amis.pk](http://www.amis.pk) with its extent mean value  $X_1=0.57$  and on other side, no farmer was use this website as a source of information (table 5).

The results of present research are slightly similar to those of Tadasadet al. (2003) who stated that 42.70% of the respondents were used websites very regularly and 33.60% of the respondents often used. While, 19.60% of the respondents used websites occasionally. Only 2.80% and 1.4% of the respondents used websites rarely and not at all respectively.

**Social media and Extension methods**

Now days, social media is the most popular approach in extension to disseminate knowledge among rural community and livestock farmers. In social media included, Facebook, WhatsApp, Instagram, LinkedIn and YouTube are the very prominent (Meena et al., 2013). There are some social media and extension methods mentioned in Table 6.

**Table 6. Utility percentage and extent of utilization of extension field staff (EFS) and farmers on the basis of essential social media as ICT tool and extension methods**

Extension Field Staff				Variables		Farmers						
Utility		Extent of Utilization		Different ICT Tools		Extent of Utilization		Utility				
Yes	No	Mean (X <sub>1</sub> )	W. Score	Social Media	W. Score	Mean (X <sub>2</sub> )	Yes	No				
F	%						F	%	F	%	F	%
145	92.9	11	7.1	3.76	588	WhatsApp	544	1.42	155	40.5	228	59.5
139	89.1	17	10.9	3.36	525	Facebook	484	1.26	148	38.6	235	61.4
0	0	156	100	0	0	YouTube (Zarat Nama)	0	0	0	0	383	100
145	92.9	11	7.1	3.51	548	YouTube (Any other channels)	567	1.48	140	36.6	243	63.4
27	17.3	129	82.7	0.54	85	Instagram	72	0.18	23	6	360	94
9	5.8	147	94.2	0.19	30	LinkedIn	0	0	0	0	383	100
<b>Extension Methods</b>												
156	100	0	0	2.82	440	Exhibition	366	.95	124	32.4	259	67.6
117	75	39	25	1.79	280	Conference	38	0.09	23	6	360	94



156	100	0	0	4.73	738	Training Workshops	241	0.62	108	28.2	275	71.8
133	85.3	23	14.7	2.66	354	Seminars	53	0.13	23	6	360	94
156	100	0	0	3.42	535	Farm Visit	270	.70	131	34.2	252	65.8
156	100	0	0	4.05	632	Farmer Training Programs	194	0.50	101	26.4	282	73.6
156	100	0	0	3.77	589	Office Call	239	0.62	116	30.3	267	69.7
130	83.3	26	16.7	0.21	34	Phone Call	1217	3.17	315	82.2	68	17.8
156	100	0	0	3.81	595	Visits of Animal Markets	1041	2.71	308	80.4	75	19.6
156	100	0	0	2.34	366	Hours and cattle Show	56	0.14	40	10.4	343	89.6
130	83.3	26	16.7	2.49	389	School Focus Program	156	0.40	70	18.3	313	81.7
154	98.7	2	1.3	3.57	558	Group Meetings	0	0	0	0	383	100
0	0	156	100	0	0	Folk Media	0	0	0	0	383	100
155	99.4	1	.6	4.46	696	Demonstrations	103	0.26	55	14.4	328	85.6
150	96.2	6	3.8	2.98	466	Farmers Walk		0	0	0	383	100
145	92.9	11	7.1	3.36	525	Computer + Internet	236	0.61	87	22.7	296	77.3
34	21.8	122	78.2	0.40	63	CD/DVD	11	0.02	8	2.1	375	97.9
60	38.5	96	61.5	0.91	142	Video/Video conferencing	0	0	0	0	383	100
112	71.8	44	28.2	1.81	283	Robo Call	0	0	0	0	383	100
10	6.4	146	93.6	0.10	16	Voice Mail Message	0	0	0	0	383	100

**Scale:** 1=Very low, 2=Low, 3=Medium, 4=High, 5=Very high

**WS:** Weighted Score

Overwhelming majority (92.9, 92.9 and 89.1%) of the respondents from EFS used WhatsApp, YouTube and Facebook with their mean values  $X_1=3.76$ , 3.51 and 3.36 respectively and standing at top position in social media to share and gain information related to

dairy animal production. On other side, less than half and more than one third (40.5, 36.6 and 38.6%) of farmers were used WhatsApp, YouTube and Facebook with their extent mean values  $X_2=1.42$ , 1.48 and 1.26 respectively.

However, less than one fifth and few (17.3 and 5.8%) of the respondents from EFS were used Instagram and LinkedIn with their extent mean values  $X_1=0.54$  and 0.19. while, only 6% of farmers were used Instagram with its extent mean value  $X_2=0.18$ . No any farmer was used LinkedIn.

You tube (Zarat Nama) was not used by both sides (EFS & Farmers) of the respondents (table 6).

### **Extension Methods:**

Data also disclose that all (100%) of the Extension field staff were used Exhibition, Training Workshops, Farm Visit, Farmer Training Programs, Office Call, Visits of Animal Markets and Hours and cattle showed their extent of use mean values  $X_1=2.82$ , 4.73, 3.42, 4.05, 3.77, 3.81 and 2.34 respectively to gain and deliver knowledge among dairy farmers. Whereas, 32.4, 28.2, 34.2, 26.4, 30.3, 80.4 and 10.4% of the farmers were used and attended these said extension methods with their extent mean values 0.95, 0.62, 0.70, 0.50, 0.62, 2.71 and 0.14 respectively.

Overwhelming majority (98.7, 99.4, 96.2 and 92.9%) of the respondents from EFS used Group Meetings, Demonstrations, Farmers Walkand Computer + Internet with their extent mean values  $X_1=3.57$ , 4.46, 2.98 and 3.36 respectively. Although, 0, 14.4, 0, 22.7% of farmers used these extension methods with their extent mean values  $X_2=0$ , 0.26, 0, 0.61 respectively.

Great majority (85.3, 83.3 and 83.3%) of Extension field staff were used seminar, phone call and school focus program with their extent mean values  $X_1=2.66$ , 0.21 and 2.49. while, 6, 82.2 and 18.3% of farmers were aware by seminar, phone call and school focus program with their extent mean values  $X_2=0.13$ , 3.17 and 0.40 respectively.

Conference and Robo call were used by majority (75, 71.8%) of the EFS as extension method with their extent mean values  $X_1=1.79$  and 1.81 respectively. However, only 6% farmers were used conference with its extent mean value  $X_2=0.09$  and no farmer was used Robo call.

More than one third and less than one fourth (38.5 and 21.8%) of the respondents from EFS used Video/Video conference and CD/DVD with their extent mean values  $X_1=0.91$  and 0.40 respectively to share their knowledge. While, only 2.1% farmers were used CD/DVD with extent mean value 0.02 to get information related to dairy animals. No farmer was used and adopted Video/Video conference as ICT.

At the last, data reveal, no any respondent from both side (EFS & Farmers) was used folk media as a source of information (table 6). The results of present study are contradictory to those of Ali *at al.* (2019) who reported about the use of various extension methods/media on the basis of extent of information delivered. Farm and home visits had weighted score 90 with mean value 5.00, whereas, field days, group discussion, farmer's training and demonstrations had weighted score of 89, 88, 80 and 74 respectively. However, office call had weighted score 51.

## CONCLUSION

It is concluded that role of ICT is increasing day by day with the advancement in information technology field. Study concluded that there was great difference between livestock extension field staff and farmers regarding utilization of all types of ICTs. Extension field staff (EFS) was mostly used concentrated ICT tools with maximum percentage and their mean values to disseminate knowledge among dairy farmers. While, farmers also used ICTs tools to get information related to dairy animals' production but their percentage and utilization level were less than EFS. Study shows that there is dire need to create awareness regarding ICT tools and their utilization to update their knowledge level. Owing to this, experts and farmers can compete with international market trends.

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## CONFLICT OF INTEREST

Authors declared no conflict of interest.

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