ICT Using Behavior and Perceived Information Needs of the Livestock Farmers in a AQUA and Warna Wired Village ICT Projects in Maharashtra State

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ABSTRACT

The present study carried out to assess the ICT using behavior and livestock information needs of livestock information users in aAQUA and Warna Wired Village (WWV) ICT projects in Maharashtra state. Total 150 respondents selected randomly and desired information collected by direct interview method for study. Irrespective of the selected two ICT projects, majority of respondents were from medium (58.66%) followed by low (26.67%) and (14.67%) high category of livestock information user. More than half of the respondents belonged to middle aged group i.e. 35 to 60 years, male (94%), belonged to general category (64.66%), had high school level of education (30%), small farmers (45.33%) from medium gross annual income (62%) and (64%) medium size of livestock holding i.e. 2 to 7 animals. Possess Television (76.67%) followed by Mobile as information aids with medium ICT experience, using livestock information services once in month. However, respondents had insufficient knowledge of computer and internet (68.67%) preferred Marathi language (90%) for livestock information. Overall, majority of the respondents (66.33%) perceived moderate and higher (20%) need of livestock related information in the operational area of ICT projects. Selection of high yielding dairy animals (90.66%), urea molasses treatment (90.33%), seasonal management of crossbred (81.33%) in WWV and detection of heat (81.33%), cultivation of green fodder (86.66%) and silage and hay making (88%) in aAQUA whereas, more than 90 per cent of the respondents perceived information of disease of high yielding animals, preventive measures for contagious diseases of animals and vaccination schedule for dairy, poultry and goats as most appropriate information in aAQUA and WWV. More than 80 per cent respondents perceived information of markets and prices, insurance of livestock, financing sources and government policies as appropriate to most appropriate however, innovative animal husbandry technologies information perceived as most appropriate by 94.66 per cent and 97.33 per cent respondents in aAQUA and WWV projects.

Key words: *Use of ICT; Information needs; Livestock farmers; ICT project;*

Livestock resources play an important role in Indian economy with huge population. It provides livelihood to more than two-third of rural community contributed 16 per cent to the income of small farm households. Dissemination of innovative animal husbandry information is necessary to support decision making capacity of the livestock farmers to improve the productivity of their stock (*Singh et.al.2016*). ICT is important tool for learning and dissemination of livestock husbandry knowledge (*Angello, 2015*). ICT-based information delivery has helped the livestock farmers in making significantly better quality decisions on various livestock practices (*Jabir, 2011*). The information acquisition and facilitating transactions in input and output markets by ICT-based initiatives have also helped farmers in reducing transaction cost (*Adhiguru and Devi, 2012*). An effective and profitable livestock production cannot be achieved if information is neither available nor accessible to the livestock keepers. Appropriate information is very important because it will enable the livestock keepers to domesticate their animals in the most profitable way. Assessment of

information needs is essential to design and development of desire need-based information systems and to provide an effective information service to the target group. Warna Wired Village (WWV) project in Kolhapur and aAQUA (almost All Questions Answered) in Pune district of Maharashtra state is providing livestock related information through online and Village Information Kiosk (VIK). The quality and performance of the information services of ICT projects is mostly judged on the basis of its content. It is crucial factor to fulfil information needs and the knowledge empowerment of the users. The development of need-based content is solely depends upon the information needs of the users. In view of this the present study is designed to study the personal, socio-economic and ICT related attributes of the livestock information user farmers and their information needs with respect to livestock farming practices.

METHODOLOGY

The co-operative initiated Warna Wired Village (WWV) and a public initiated aAQUA ICT project are providing the livestock information services in Western part of Maharashtra. The present study has been conducted in functional area of purposively selected WWV in Kolhapur and Sangli and aAQUA ICT projects in Pune districts of Maharashtra state. Seventy five livestock information users from each project and total 150 respondents from two ICT projects were randomly selected to study the socio-economic profile, use and preference of ICT related services and their information needs for breeds and breeding practices of livestock, feeding and fodder production, care and management, livestock health care, marketing of livestock and livestock products and livestock insurance along with weather forecasting, innovative animal husbandry technology and livestock production management in disaster condition. The perceived information needs was measured on three point continuum scale as most appropriate-3; appropriate-2 and least appropriate-1.The responses were scored, measured by mean and standard deviation and presented in terms of frequency and percentage.

RESULTS AND DISCUSSION

Profile of Livestock Information Users in the Selected ICT Project :

Socio-personal attributes of the livestock information users : It is reveled that majority of the respondents belonged to middle aged 62.66 per cent and 54.66 per cent in both the projects i.e aAQUA and WWV. The no. of respondents found to be higher (30.67%) in old age category in WWV as compared to about 17 per cent in the aAQUA. This finding is in line with *Ghasura et.al. (2011)*. Further, it is observed that in both the ICT projects more than 90 per cent were the male users of livestock information services. This findings also supported by *Nnenna (2013), Nwagwu and Soremi (2015)* and *Tembe et.al. (2016)* who reported that 70 per cent (112) woman and 30 per cent (48) men were ICT users among farmers for Improving Chicken Production in Morogoro Municipality, Tanzania. Further study revealed that category wise, about 45 per cent from General and 36 per cent from OBC category in aAQUA in comparison to 84 per cent of the respondents from General category in WWV ICT project. In aAQUA, 28 per cent and about 23 per cent respondents were educated up to intermediate and high school level of education. However, more than one-third (37.34%) and 20 per cent of the respondents were high school and graduate and above educated in WWV project. This finding is in line with *Nwagwu and Soremi (2015)* who reported that most of the ICT user livestock farmers had university (47.6%) and (23.8%) polytechnic education in Ibadan agrarian community in Nigeria.

More than half (52%) of the respondents in aAQUA and about 39 per cent in WWV ICT project belonged to the small farmer category i.e. 2.5 to 5 acre of land holding. This finding supported by *Nnenna (2013)* Who reported that the farm size of most (35.83%) of the farmers ranged between 1.6 – 2.0 hectares and the mean farm size of the farmers was 1.4 hectares among the ICT users farming households of south east Nigeria. Majority of the respondents 68 per cent and 65.33 per cent were belonged to the medium category of gross annual income in aAQUA and WWV project. However, 60 per cent of the respondents in aAQUA and 68 per cent in WWV had medium livestock holding. Medium level of social participation 77.33 per cent in aAQUA and 54.67 per cent in WWV ICT projects. This finding also supported by *Nnenna (2013)* who reported that most of the farmers (68.33%) belonged to social organizations, but only 31.67% were not members of social organizations in ICT users farming households of south east Nigeria

Communication and ICT related attributes of

livestock information users : It is reported that majority of the respondents possessed Television (65.35%) and mobile (52%) in aAQUA as against the 88 per cent and 72 per cent respondents in WWV projects. Very meager 2.33 per cent of the respondents possessed the computer and internet in their home in WWV project. This finding is supported by *Arnstrong and Gandhi (2012)* who reported that most of the farmers using Television followed by Mobile for agricultural information gain among rural farmers in Ratnagiri district of Maharshtra. More than 60 per cent of the respondent had medium ICT experience in aAQUA while in WWV respondents were having low to medium level of experience of ICT. None of the respondents in both the ICT projects using livestock information services on daily basis however, 52 per cent respondents in aAQUA and 68 per cent in WWV project were using the services fortnightly and on monthly basis. This finding is in contrast with *Tembe et.al. (2016)* who reported that 37.5% of the farmers using mobile phones frequently while 21.3 per cent use it moderately for information of improving chicken production in Morogoro Municipality, Tanzania. Majority of the respondents 62.64 per cent and 74.67 per cent not fully acquainted or operating independently the computer and internet for information retrieval related to livestock in aAQUA and WWV project. More than eighty per cent in aAQUA and 96 per cent of the respondents in WWV wish to have the livestock related information in local language i.e. Marathi.

Perceived information needs of the livestock information users in selected ICT project : The perceived information needs of livestock farmers assessed in the six major areas of the livestock management practices vi. Breeds and breeding, feeding and fodder production, care and management, health care, livestock marketing and insurance and miscellaneous practices in livestock farming in the selected area of aAQUA and WWV ICT projects.

It is reported from Table 1 that about 55 per cent of the respondent perceived that information on selection of high yielding dairy animal is appropriate in operational area of aAQUA whereas, about 91 per cent of the dairy information users in Warana Wired Village project revealed that such information would be most appropriate for augmenting production and productivity of livestock. In aAQUA project, majority of the information users (81.33%) considered the knowledge regarding detection of heat in productive animal as appropriate information needs against 60 and 24 per cent of respondents who considered it appropriate and least appropriate in the Warana Wired Village project. This might be due to the difficulties in detection of heat due to silent heat in buffaloes. About 69 per cent of the respondents perceived need of information on desirable breeds of goat for meat purpose as most appropriate in aAQUA project. Compared to farmers from Warana Wired Village project area, about 65 per cent perceived it as appropriate. This mainly occurred due to the increased consumer demand for goat meat attracted and motivated the goat farmers to go for ideal goat farming. Further, about 77 per cent of the respondents perceived the information on suitable poultry variety for backyard farming as most appropriate and only 16 per cent perceived it as least appropriate in aAQUA whereas, only three fourth of the information users considered the information on backyard poultry variety appropriate in Warana Wired Village project.

Table 2 shows that more than half respondents (58.67%) perceived the information on productive ration for high yielding animals as appropriate and most

Table 1. Perceived livestock breeds and breeding information needs of the livestock information users in selected ICT project

Information Needs	aAQUA (n= 75)			WWP (n= 75)		
	MA	A	LA	MA	A	LA
Suitable cattle and buffalo breeds according to agro-climatic zone	19 (25.33)	46 (61.33)	10 (13.33)	50 (66.66)	25 (33.33)	0 (0.00)
Selection of high yielding dairy animals	18 (24.00)	41 (54.66)	16 (21.33)	68 (90.66)	06 (8.00)	01 (1.33)
Detection of heat symptoms in animals	09(12.00)	61 (81.33)	05 (6.66)	12 (16.00)	45 (60.00)	18 (24.00)
Desirable breeds of goat for meat purpose	52 (69.33)	15 (20.00)	08 (10.66)	20 (26.66)	49 (65.33)	06 (8.00)
Suitable poultry variety for backyard poultry farming	58 (77.33)	05 (6.67)	12 (16.00)	40 (53.33)	28 (37.33)	07 (9.33)

MA- Most appropriate A- Appropriate LA- Least Appropriate

Table 2. Perceived livestock feeding and fodder production information needs of the livestock information users in selected ICT project

Information Needs	aAQUA (n= 75)			WWP (n= 75)		
	MA	A	LA	MA	A	LA
Productive ration for high yielding animals	31 (41.33)	44 (58.67)	0 (0.00)	55 (73.33)	20 (26.66)	0 (0.00)
Urea molasses treatment for fodder enrichment	16 (21.33)	53 (70.66)	06 (8.00)	70 (93.34)	05 (6.66)	0 (0.00)
Cultivation of green fodder like berseem and lucern etc.	65 (86.66)	08 (10.66)	02 (2.67)	11 (14.66)	40 (53.33)	24 (32.00)
Silage and hay making	05 (6.67)	66 (88.00)	04 (5.33)	07(9.33)	47 (62.66)	21 (28.00)
Use of local feed ingredients for backyard poultry	51 (68.00)	18 (24.00)	06 (8.00)	16 (21.33)	32 (42.66)	27 (36.00)

appropriate (41.33%) need in aAQUA and more than 70 and about 27 per cent perceived it as most appropriate and appropriate information in Warana Wired Village project. It revealed the fact that they were aware that appropriate feeding of animals may significantly reduce the production cost of high yielding animals. Similarly more than 90 per cent of the respondents revealed the desire to have information on urea molasses treatment for fodder enrichment in aAQUA and Warana Wired Village project. This might be due to the optimum availability of byproduct sugarcane molasses in the sugarcane production belt of the project area.

Study further revealed that majority of the respondents (86.66%) were found to be interested to have information on cultivation of green fodder like berseem and lucern in aAQUA as compared to 54 per cent of the information users showed the desire for such information in Warana Wired Village project. Regarding information on hay and silage making, majority of the information users (88%) considered as appropriate in aAQUA and in Warana Wired Village project. According to them, regular feeding of hay and silage ensure the sustain growth, fattening and continuous milk production even in difficult periods enabled to fetch higher market prices. More than 90 per cent of the respondents showed their interest on use of local feed ingredients in backyard poultry feed in aAQUA against about 43 per cent of information users in Warana Wired Village project. This finding is in line with *Tembe et al. (2016)* reported that 57.5 per cent of the farmers accessing ICT information services required more education on poultry nutrition and housing.

It is reported from Table 3 that more than half (57.33%) of the respondents in aAQUA expressed the need of information on management of heifers for early maturity as appropriate as compared to about 79 per cent treated it as most appropriate in Warana Wired Village project might be due to the problem of late maturity and . The seasonal management of dairy crossbred animals perceived as most appropriate (73.34%) in aAQUA whereas, more than 98 per cent of the information users perceived as appropriate information needs in WWV project area as the crossbred animals are proved to the best vehicle for profitability of dairy business in terms of quality and quantity of milk production. The information on construction of shed and housing management was considered as appropriate by 56 per cent and 80 per cent users in aAQUA and WWV project. It might be due to the fact that keeping animals in open may adversely affected by the change in climate. More than 90 per cent of the respondents desire to have information on care and management of goat kids in aAQUA might be due to the experience of problem of kid mortality. In WWV, 31 per cent found it least important information

Table 3. Perceived livestock care and management information needs of the livestock information users in selected ICT project

Information Needs	aAQUA (n= 75)			WWP (n= 75)		
	MA	A	LA	MA	A	LA
Management of heifers for early maturity	18 (24.00)	43 (57.33)	14(18.66)	59 (78.66)	16 (21.33)	0 (0.00)
Seasonal management of crossbred dairy animals	55 (73.34)	20 (26.66)	0 (0.00)	61 (81.33)	13 (17.33)	01 (1.33)
Construction of shed and housing management	22 (29.33)	42 (56.00)	11(14.66)	07 (9.33)	60 (80.00)	08(10.66)
Care and management of kids	54 (72.00)	15 (20.00)	06 (8.00)	09 (12.00)	43 (57.33)	23 (30.66)
Care and management of chicks	48(64.00)	19(25.33)	08(10.67)	04 (5.33)	52 (69.33)	17 (22.66)

Table 4. Perceived livestock health care information needs of the livestock information users in selected ICT project

Information Needs	aAQUA (n= 75)			WWP (n= 75)		
	MA	A	LA	MA	A	LA
Diseases of high yielding dairy animals	12 (16.00)	51 (68.00)	12(16.00)	72 (96.00)	03 (4.00)	0 (0.00)
Preventive measures for contagious diseases of animals	10 (13.33)	61 (81.33)	06(8.00)	68 (90.66)	07 (9.33)	0 (0.00)
Vaccination schedule for dairy, poultry and goats	70 (93.33)	05 (6.67)	0 (0.00)	67 (89.33)	08 (10.66)	0 (0.00)
Control of parasitic infestation in goats	07 (9.33)	65 (86.66)	03 (4.00)	06 (8.00)	52 (69.33)	17 (22.66)
Information about Ranikhet Disease, Avian Influenza, coccidiosis etc.	59 (78.66)	11 (14.66)	05 (6.67)	13 (17.33)	48 (64.00)	14 (18.66)

need might be due less goat farming practices in project area. Sixty-four per cent of the information users perceived the information on care and management of chicks as most important in aAQUA as compared to 69 per cent respondents in WWV project. This finding supported by *Tembe (2016)* who reported that 82.5 per cent of the ICT user farmers indicated their need for more education on chicken husbandry for improving chicken production in Morogoro Municipality, Tanzania.

It is observed from Table 4 that more than 68 per cent of the respondent perceived appropriate needs of information on diseases of high yielding dairy animals in aAQUA and most appropriate by the 96 per cent of the respondents in WWV project due to large no. farmers engaged in dairy farming practices. Majority of the respondent 81.33 per cent and 90.66 per cent perceived preventive measure and contagious diseases of animals information needs as appropriate and most appropriate in aAQUA and WWV project. More than 90 per cent of the respondents in aAQUA and WWV projects treated information of vaccination schedule for dairy, goat and poultry birds as most appropriate. This findings also supported by *Syiem and Raj (2015)* who reported that the use of ICT initiatives services on livestock vaccination and availability of breeds of livestock management were reported to have maximum usage by the farmers in East Khasi Hills and Ri-Bhoi District in Meghalaya.

About 87 per cent of the respondents perceived control of parasitic infestation in goats as most appropriate information needs due to large no. of information users are goat keepers in the operational area of aAQUA whereas, 69.33 per cent treated it as appropriate need in WWV project. Majority of the respondents (78.66%) expressed the information about poultry diseases i.e. Ranikhet Disease, Avian Influenza, Coccidiosis etc. as most appropriate in aAQUA as compared to 64 per cent of respondents treated it as appropriate in WWV project. This finding is in also supported by *Tembe et.al. (2016)* who reported that availability of information on poultry diseases and control was in shortage expressed by 70 per cent of ICT user farmers for improving chicken production in Morogoro Municipality, Tanzania.

It is observed from Table 5 that more than 60 per cent and about 89 per cent of the respondents perceived information of availability of market, its prices and demand for the livestock and livestock products as most

Table 5. Perceived livestock marketing and insurance related information needs of the livestock information users in selected ICT project

Information Needs	aAQUA (n= 75)			WWP (n= 75)		
	MA	A	LA	MA	A	LA
Information on local available markets, prices and demand for livestock and livestock products	19 (25.33)	47 (62.67)	09(12.00)	67 (89.33)	08 (10.66)	0 (0.00)
Information on export-import of livestock products like milk, meat and eggs	09 (12.00)	43 (57.33)	23 (30.66)	59 (78.66)	10 (13.33)	06 (8.00)
Insurance, insurance schemes and agency for livestock	08 (10.66)	62 (82.67)	05 (6.67)	23 (30.66)	51 (68.00)	01 (1.33)
Sources of financing and credits for livestock farming	15 (20.00)	60 (80.00)	0 (0.00)	09 (12.00)	64 (85.33)	02 (2.66)
Government policies regarding livestock farming	04 (5.33)	55 (73.34)	16 (21.33)	61 (81.33)	09 (12.00)	05 (6.66)

important in aAQUA and Warana Wired Village project. This may be helpful to livestock farmers for sound decision making in production and marketing of value added products to fetch the maximum benefits out of it. This finding is supported by *Tembe et.al. (2016)*. About 57 per cent of the information users in aAQUA expressed the information on export-import of livestock products as appropriate information needs and 78.66 per cent expressed it as most appropriate in WWV as the information users fall in the progressive farmers category able to produce export quality livestock products. These findings are supported by *Bhatnagar (2000)* and *Oyeyinka and Bello (2013)* who reported that farmers used ICTs to know the market days, to know where products could be sold and identifying different market location for efficient marketing of produce.

Majority of the respondents (82.67%) considered information on insurance, agencies and insurance schemes for livestock in aAQUA as most appropriate need as compared to 68 per cent considered it as appropriate information needs in WWV project. More than 80 per cent of the respondents treated the information of financing and credits institutions as appropriate in both the studied ICT projects it might be due to motivated and inspired unemployed youths seeking for financial assistance for livestock entrepreneurship. This finding is in line with *Tembe et.al. (2016)*. More than 70 per cent of the respondents perceived the information on government policies for livestock farming as appropriate in aAQUA and about 82 per cent perceived it as most appropriate information needs in WWV project This finding are supported by *Meera et. al., (2004)* and *Syiem and Raj (2015)* who reported that farmers used services of ICT initiatives for information of government schemes in East Khasi Hills and Ri-Bhoi District in Meghalaya.

Table 6 shows that in aAQUA, 56 per cent and 69.33 per cent of the respondents in WWV project perceived the need of agricultural production and price information as appropriate it might be due to the more involvement of the users in agriculture farming practices. This finding is in line with *Meera et. al., (2004), Sharma (2005)* and *Narula (2010)* who reported that around 40 per cent agricultural farmers required information on agri-inputs. Further study reported that weather forecasting information as appropriate information need expressed by about 51 per cent of the respondents whereas, about 43 per cent of users considered it as least appropriate project in aAQUA. According to them, uncertainty in weather forecasting may or may not be proper in terms of rainfall, temperature or starting of monsoon. This finding is supported by *Meera et. al., (2004)* and *Armstrong and Gandhi (2012)* reported that majority of farmers wanted information related to the weather forecasts (67%) and (32%) market prices. Further, study revealed that about 79 per cent of the respondents in WWV project perceived weather forecasting information as appropriate whereas, 51 per cent treated it as appropriate. However, 42.66 per cent of the respondents in aAQUA perceived it as least appropriate information need might be due lack of faith on weather forecasting information provided by project. This finding is supported by *Sharma and Rao (2005).*

About 65 per cent in aAQUA and 73.33 per cent of the respondents in WWV project expressed the information of land in computerized form as appropriate due to the easy access and availability of land record. These findings are in line with *Meera et. al. (2004).* The study revealed that majority of the respondents about 95 per cent in aAQUA and 97 per cent in WWV project expressed the information of innovative animal husbandry technology was most appropriate need of

Table 6. Perceived miscellaneous information needs of the livestock information users in selected ICT project

Information Needs	aAQUA (n= 75)			WWP (n= 75)		
	MA	A	LA	MA	A	LA
Agriculture production and price information	07 (9.33)	42 (56.00)	26(34.66)	15 (20.00)	52 (69.33)	08(10.66)
Weather forecasting	05 (6.66)	38 (50.66)	32 (42.66)	04 (5.33)	59 (78.66)	12 (16.00)
Land record computerization	10 (13.33)	49 (65.33)	16 (21.33)	09 (12.00)	55 (73.33)	13 (17.33)
Innovative animal husbandry technology	71 (94.66)	04 (5.33)	0 (0.00)	73 (97.33)	03 (4.00)	0 (0.00)
Livestock production and management in disaster (flood, drought etc.)	08 (10.67)	50 (66.66)	17 (22.67)	10 (13.33)	60 (80.00)	05 (6.66)

Table 7. Overall need of livestock information perceived by livestock information users

Categories	aAQUA (n= 75)	WWVP (n= 75)	Overall (N= 150)
Low	07 (9.33)	14 (18.66)	21 (14.00)
Moderate	56 (74.67)	43 (57.33)	99 (66.33)
High	12 (16.00)	18 (24.00)	30 (20.00)
Mean ± SD	68.25± 8.07	67.6± 5.46	67.92± 6.87

the respondents. This finding supported by *Narula (2010)*. Further study reported that the information on management of animals during disaster perceived as appropriate by 66.67 per cent and 93 per cent of the respondents in aAQUA and WWV ICT project.

It is revealed from Table 7 that Irrespective of the selected ICT projects, overall majority of the respondents (66.33%) belonged to moderate followed by high (20%) and 14 per cent were found in low category of the information needs. About 75 per cent in aAQUA and 57.33 per cent in WWV project were found in moderate category. However, 16 per cent and 24 per cent of the respondents in aAQUA and WWV were found in high category of information needs related to livestock management practices.

CONCLUSION

ICT user livestock farmers in the project area of aAQUA and WWV were mostly middle aged, literate, small farmers use to keeping sizable livestock for their livelihood security. Inadequate knowledge of respondents about use of ICT tools for information retrieval was the limiting factor for utilization of livestock information services and shown their preference for information in local language i.e. Marathi. The important extension strategies, mass awareness and demonstration in project area will be helpful to increase size of ICT user friendly livestock farmer. Livestock farmers in project area needs specific detail and updated animal health care information like various diseases of animals, preventive measures and their vaccination and information of livestock markets and their prices, insurance of livestock, sources of financing and government policies for livestock welfare and animal husbandry technologies were the priority areas of information needs in both i.e. aAQUA and WWV ICT projects. The efforts should be taken by ICT projects for the development of local language need-based content to harnessing ICT in development of livestock farming in the project area.

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