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INFORMATION COMMUNICATION TECHNOLOGIES (ICTS) EMPLOYED BY YOUNG FARMERS IN ACCESS AND USE OF DAIRY AGRICULTURAL INFORMATION IN MURANG'A COUNTY, KENYA

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Abstract *Information Communication Technology (ICT) has changed the way information is created, stored, accessed and disseminated. It has the potential to enhance access and use of agricultural information by farmers in rural areas thereby improving their farming practices. The study was undertaken to assess how young farmers use ICT technologies in accessing and using dairy agricultural information in Murang'a County, Kenya. The study aimed at assessing the awareness by farmers on technologies available for use in accessing agricultural information and strategies used by farmers in accessing and using dairy agricultural information as a way of promoting dairy farming production. The results of the study revealed that 88% of the farmers agreed that they were aware of the use of technology in accessing agricultural information. 75% of the respondents used radio where television was rated second while mobile phones were rarely used. Majority at (80%) never used technologies such as computers, CD/DVD and social media to access and use dairy agricultural information. Three quarters (75%) preferred using other sources such as extension workers, friends, and relatives over technology. All the extension officers interviewed used technology to acquire and disseminate information. Radio was highly used, followed by internet/web services and social media. The study concluded that dairy farmers have limited access to modern technologies such as mobile phones in access and use of agricultural information. The Kenya National Library Services in collaboration with the Department of Livestock Production should set up exhibitions and information literacy programs for dairy farmers. Infrastructure should be improved in the rural areas of Murang'a County by setting up Cyber cafes within the sub-counties and educate dairy farmers on the use of ICT technologies to access and use agricultural information.*

Keywords: *Youth, Small-Scale Farmers; ICTs, Dairy Agricultural Information, Access and Use of Agricultural Information*

Information is valuable in every development process. Access to agricultural information by farmers is crucial for advancing food production at the rural community (Yusuf, Masika, & Ighodaro, 2013). In the information era, distribution and utilization of information by information providers to farmers will play a considerable role in the improvement of farming methods and practices.

Application of information and communication technologies in agricultural information dissemination is also very crucial. According to Sousa, Nicolay, and Homem (2016), in the last three to four years there has been high adoption of ICTs in rural Africa and this has changed the way young farmers communicate and exchange information. A study by Subash, Gupta, and Babu (2015), recommends that effective system need to be implemented specifically on employment of information communication technologies to deal with the information needs of dairy farmers. Under-utilization of ICTs in agricultural information searching is mainly caused by lack of suitable ICT skills and lack of awareness of existing of ICT tools (Tadesse & Bahiigwa, 2015). Adebola (2013), in his study points out that "agriculture is viewed as unattractive to youths and they tend to have a negative perception on it". He, therefore, suggests that "there need to make the agricultural sector attractive to youths through re-branding, education and making full use of Information and Communications Technology (ICT)." Irungu, Mbugua, and Muia (2015) also suggest that in order to attract more youths in the farming industry, one of the main strategies is

the integration of information communication technologies (ICTs) such as the internet, mobile phones, with traditional devices such as radio, television, and press.

Dairy farming has become popular among the youth in Murang'a County, Kenya following the introduction of "One Youth One Cow" initiative project that was launched by Governor Mwangi wa Iria on 23rd September 2015. The project is under the partnership of Murang'a County Government and Murang'a County Creameries (MCC). It provides an affordable and friendly financial plan that enables the youths in the age bracket of 18-35years to venture into dairy farming. The first phase was done during the launching day. Two hundred and fifty (250) cows were given to beneficiaries drawn from various sub-counties. Since then the program has been giving out more cows to the youth on annual basis. To support and sustain the "One Youth One Cow" program in Murang'a County, access and utilization of dairy agricultural information by the young beneficiaries is a major factor in advancing small-scale dairy agricultural production. Fewer works have been done on how farmers use technologies in accessing dairy farming information. The study was conducted to assess the use of technologies among the young dairy farmers and agricultural extension officers in Murang'a County.

Methodology

The study was carried out in Kangema, Kiharu, Kigumo and Mathioya sub-counties of Murang'a County. The descriptive research design was used. A sample size of 164 respondents was used. These include 152 farmers who were selected from a target population of 250 young dairy farmers and all the existing 12 extension officers in the County. A sample size of 152 dairy farmers was determined using Krejcie and Morgan (1970) Table for determining sample size. Simple random and purposive samplings were used to select 152 small-scale dairy farmers and 12 extension officers respectively. Data was collected through the use of questionnaires and interview guides. 140 questionnaires were distributed to dairy farmers and issued to all the extension officers. 12 farmers and four extension officers were interviewed. SPSS software was used in analyzing both quantitative and qualitative data. Charts, graphs and frequency tables were used to present analyzed data.

Results and Discussions

Out of 140 questionnaires given to dairy farmers, 113 were returned giving a return rate of 81%. 100% return rate was obtained for all the 12 extension officers.

Dairy Farmers Use of Technology

The main objective of this study was to find out technologies employed by young dairy farmers in accessing dairy agricultural information in Murang'a County. The findings are provided as follows:

Farmers Awareness on Use of Technology

The study sought to establish farmer awareness on the use of modern technology in accessing information and also identify the particular technologies used in accessing dairy farming information. Farmers were asked their awareness to the use of technology and the findings are indicated in Table 1.

Table 1: Farmers Awareness on Use of Technology

Response	Frequency	Percentage
Yes	99	88
No	14	12
Total	113	100

Table 1 shows that 99 farmers representing 88% agreed that they were aware of the use of technology in accessing agricultural information. This forms the majority of the respondents as only 14 representing 12% disagreed with the question. It can be deduced that dairy farmers in the area studied keep track of the modern sources of information.

Use of Technology by Dairy Farmers in Accessing Agricultural Information

It was important for the study to establish the technologies used by dairy farmers and also determine the frequency of use. Respondents were further asked how often they use various technologies in accessing dairy agricultural information and the responses are shown in Fig. 1.

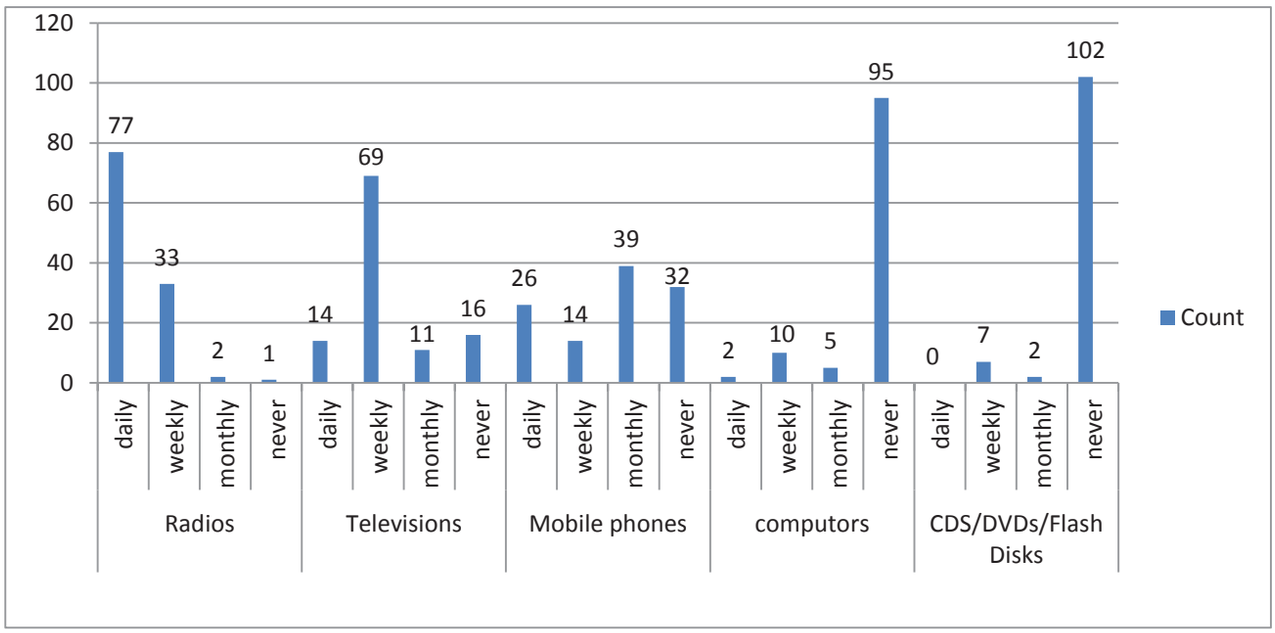

Fig. 1: Use of Technology by Dairy Farmers

According to Fig. 1 above, out of 113 respondents, three-quarter of them at 77 said they use radio on a daily basis which was closely followed by 69 respondents who use televisions on monthly basis. Less than half standing at 26, 14 and 39 of the respondents acknowledged the use of mobile phones on daily, weekly and monthly basis respectively. Majority of the respondents at 95 and 102, never use computers/laptops/tablets and CDs/DVDs/Flash disks respectively. Mburu (2013) study on factors influencing access to agricultural information by smallholders showed also that 95% of the respondents preferred using radio over other ICT channels. In addition, the findings of Ogbonna and Agwu (2013), reported that the major ICTs used in access and use of agricultural information in Nigeria were radio and television. During the interview, nine out of 12 respondents mentioned that they also use radio. They explained that they listen to farming programs and listen to news about dairy farming. This could be the reason why farmers in this area prefer the use of radio over the other channels of technology. One respondent acknowledged the use of television while the other two of the respondents said that they don't use technology explaining that they are expensive, some require training, information from radio and television cannot be referred later, and they also experience problems with infrastructure in rural areas hindering access to technologies.

The extension officers were also asked to mention the technologies they use in acquiring and dissemination dairy agricultural information. This was to ascertain whether they embrace the use of technology among themselves and the farmers. The findings are as shown in Fig. 2.

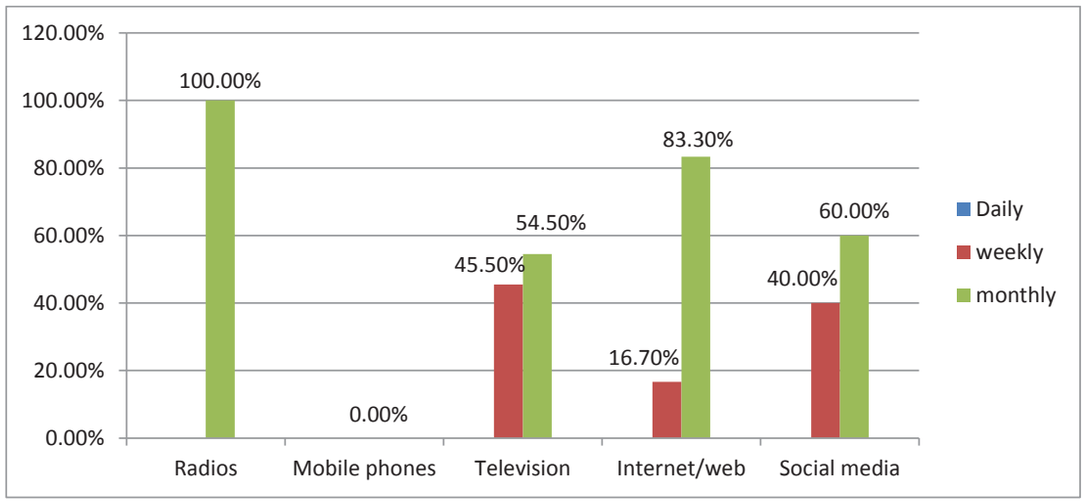

Fig. 2: Use of Technology by Extension Officers

As shown in Figure 2, it is clear that all the 12 agricultural extension officers use radio as a type of technology to acquire and disseminate information as indicated by radio representing 100%. At least half of the respondents used televisions on a weekly and monthly basis representing 45.50% and 54.50% respectively. Social media was used by 7 (60%) of the respondents representing nearly two-thirds respondents on monthly and almost half at 5 (40%) on weekly basis. None of the technologies was used daily and none of the officers used mobile phones to acquire or disseminate information. These findings illustrate that technologies are moderately used by extension officers in this area.

Use of Social Media by Dairy Farmers

The study sought to explore social media platforms used by dairy farmers in access and use of information. The respondents were asked to state whether they use social media and the response are presented in Table 2.

Table 2: Use of Social Media by Dairy Farmers

Response	Frequency	Percentage
Yes	34	70
No	79	30
Total	113	100

This study revealed that majority at 79 representing 70% of the farmers do not use social media to access agricultural information as shown in Table 2 above. Only 34 representing 30% admitted that they use social media. This shows that dairy farmers rarely use the social media platforms. Despite, Derksen (2018), state that social media "is an optional tool that dairy producers can use positively, negatively, or not at all. They can try their best to ignore it, but it has a life of its own and will grow even larger in the future".

Social Media Tools Used by Dairy Farmers

Further, the study sought to understand the adoption of social media platforms in access and use of dairy agricultural information. 34 respondents out of 113 agreed that they use social media. They were therefore asked to select the social media tools they use. The findings are as shown in Fig. 3.

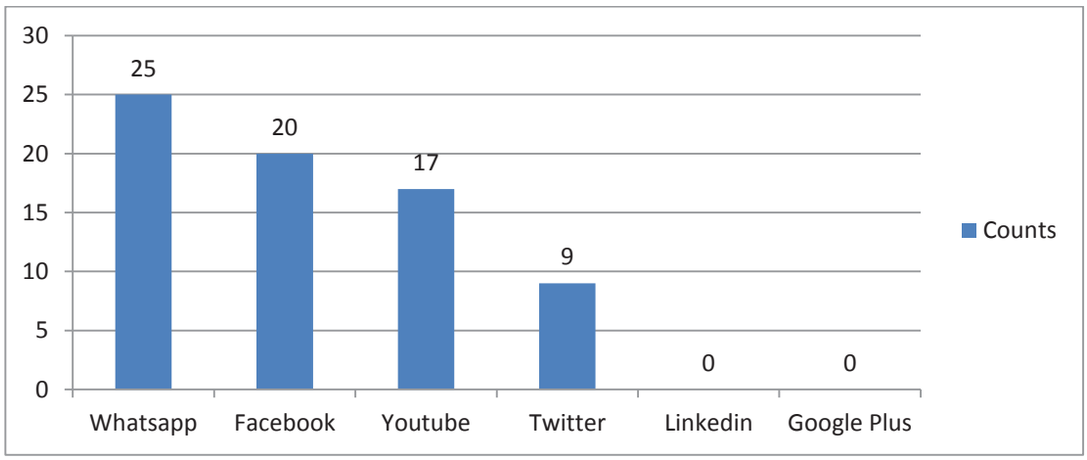

Fig. 3: Social Media Tools Used by Farmers to Get Dairy Agricultural Information

From Fig. 3 above, out of 34 respondents, WhatsApp was used by the highest number of respondents at 25 (73.5%) followed by Facebook at 20 respondents representing 58.8%. 17 respondents used Youtube accounting for 50%, nine representing 26.4% used Twitter. None of the respondents used Linkedin and Google plus. This indicates that only WhatsApp, Facebook, and Youtube attained to be used by half of the respondents suggesting that Twitter, Linkedin and Google plus are not used and known by dairy farmers. In addition, an interview with an agricultural extension officer revealed the following:

"I use social media to access dairy agricultural information. We have a page in Whatsapp and Facebook we access, share and discuss issues among the agricultural extension officers. It becomes difficult to interact with farmers in these media because most of them do not own smartphones or computers, those who have them have no interest in these platforms, and majorities are illiterate. The young people use these platforms for socialization rather than accessing constructive information". (Response from an agricultural extension officer).

These findings indicate that dairy farmers in this area rarely use social media tools in accessing agricultural information. Thakur (2017) advises that "social media tools such as WhatsApp have a remarkable ability to reduce the transaction cost as well as increase the coverage of extension services".

Further, the 34 dairy farmers who agreed that they use social media were also asked if they ask questions, contribute to discussions or share dairy agricultural information on social media platforms. Fig. 4 below present the findings.

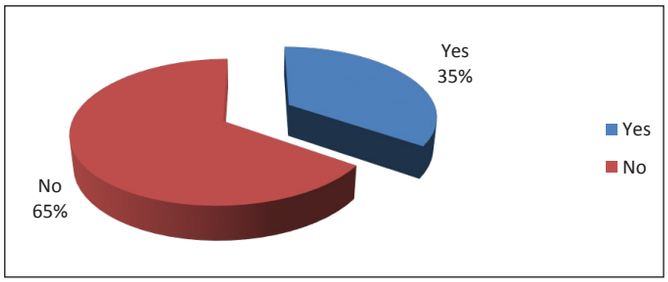

Fig. 4: Farmers Response on whether they Ask Questions in Social Media

As observed from Fig. 4, 22 out of 34 respondents representing the majority at 65% disagreed that they ask questions, share and contribute to discussions in the platforms. In an interview with dairy farmers, only two of the 12 respondents stated that they share dairy farming videos, download dairy farming notes from Youtube and also chat with friends on dairy farming issues. From the findings, it can be noted that farmers who actively use social media do not use them for the purpose of accessing dairy agricultural information.

Farmers Satisfaction on the Use of Social Media

This study also sought to establish satisfaction of dairy farmers on the use of social media. This was to determine its convenience in access to information by dairy farmers. The 34 dairy farmers who agreed that they use social media were asked whether social media satisfy their dairy information needs. The findings are presented in Fig. 5.

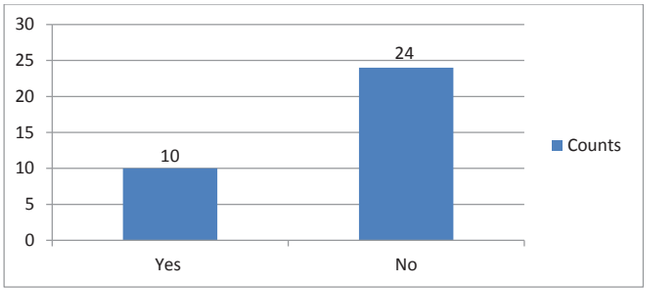

Fig. 5: Farmers Satisfaction on the Use of Social Media

Few respondents at 10 agreed that social media satisfy their information needs while the majority at 24 disagreed. This suggests that dairy farmers in the area not confident in the use of social media.

Farmers Preference in Use of Technology over other Sources

The study sought to establish whether dairy farmers value the use of technology in accessing dairy agricultural information over other sources. Farmers were asked to state their preference and the findings are presented in Table 3.

Table 3: Farmers Preference in Use of Technology over Other Sources

Response	Frequency	Percentage
Yes	45	40
No	68	60
Total	113	100

As shown in Table 3 above, out of 113 respondents, less than half of the respondents at 45 (40%) preferred using technology to access dairy agricultural information over other sources. They explained that it is easily accessible, fast and provides comprehensive, current and first-hand information. Majority of the respondents at 68 (60%) didn't prefer technology giving the reason that they faced problems with power and poor network connection in the rural areas. The findings imply that technology would only be adopted by farmers if there is improved infrastructure in the regions.

From the above findings in regard to objective four of this study, it is evident that the use of technology by dairy farmers is very low especially the use of information communication technology such as computers, laptops, tablets, CD/DVDs and social media. This could be attributed to the low level of education as revealed in this study where farmers have not acquired skills on how to use technology devices. Low source of income could also be a contributing factor where farmers do not afford the use of technology facilities. Farmers seem to be aware of this technology but do not use them.

Unlike in United States as explained by Raalte and Riel (2013) book on the use of social media shows that 76 % of farmers between the ages of 18 to 35 years use social media to share information, contact customers, and market their business; this study has revealed that majority of the young farmers do not use technology or social media to access agricultural information. Dairy farmers explained they face challenges in the use of technologies in that it is expensive, requires some training, language barrier, lack of exposure among other issues. The findings are in line with earlier studies done by Chukwunonso and Aisha (2012) and Tiwari, Chakravarty, and Goyal (2014) who found that ICT has been underutilized in accessing information due to barriers related with access to technology, access to ICT devices, farmer's IT skills, farmer's attitude, poor infrastructure, lack of awareness about internet, unavailability of ICT tools and lack of motivation to use them.

Conclusions

The study concludes that the use of technology in access of dairy information is very low among young dairy farmers in the study area. The findings showed that the main technologies used are radio and television while social media, computers /laptops /tablets, and CDs/DVDs/Flash disks were rarely used. Farmers seemed to be literate but due to technophobia and lack of exposure, they lack confidence and develop a negative attitude towards the use of these technologies. This may also be caused by challenges such as inadequate funds, inadequate extension services, lack of support by the government and poor infrastructure in rural areas.

Recommendations

- The Kenya National Library in Murang'a County in collaboration with the Department of Livestock Production in Murang'a County Government can set up annual exhibitions and information literacy programs for dairy farmers. This should be done in the sub-counties for a period of one week so as to reach farmers in the rural areas. During these programs, they can train farmers on how to access agricultural information through the available technologies and also provide brochures on the same.
- Murang'a County Government should set up cyber cafes within the sub-counties and educate dairy farmers on the use of technologies such as ICTs. This is to improve farmers access to agricultural information through all types of technologies since radio is the most used and preferred form of technology.
- The government needs to improve infrastructure in the rural areas of Murang'a County as dairy farmers complained of lack of power and poor network connections within their regions. This promotes the use of ICT technologies such as computers, tablets, social media, etc. in access to agricultural information.

References

Adebola, A. (2013). Engaging youths in agriculture through Information and Communications Technology. *Nature & Faune*, *28*(1), 67–70.

Chukwunonso, F., & Aisha, T. (2012). Problems and prospects of adopting ICT in agriculture. *African Journal of Agricultural Research and Development*, *5*(3), 39–46.

Derksen, B. (2018/04/17). Social Media and the Dairy Industry. *American Dairymen*. [Blog Post]. Retrieved from http://www.americandairymen.com/articles/social-media-and-dairy-industry

Irungu, K. R. G., Mbugua, D., & Muia, J. (2015). Information and Communication Technologies (ICTs) Attract youth into profitable agriculture in Kenya. *East African Agricultural and Forestry Journal*, *81*(1), 24–33.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*, 607–610.

Mburu, P. (2013). *Factors influencing access to agricultural information by smallholder farmers through ICT channels in deiya location, Kiambu County*. A Masters Dissertation. Nairobi: University of Nairobi.

Ogbonna, O. I., & Agwu, A. E. (2013). Access and use of information communication technologies by rural farmers in Enugu North senatorial zone, Enugu state. *Scholarly Journal of Agricultural Science*, *3*(7), 264–270.

Raalte, E. V., & Riel, M. V. (2013). *The future of farming, the rise of the rural entrepreneurs.* London: AB Publishing.

Sousa, F., Gian, N., & Home, R. (2016). *Information technologies as a tool for agricultural extension and farmer to-farmer exchange: Mobile-phone video use in Mali and Burkina Faso*.

Subash, S., Gupta, J., & Babu, G. (2015). Information needs assessment and prioritization of dairy farmers. *J Krishi Vigyan*, *4*(1), 51–55.

Tadesse, G., & Bahiigwa, G. (2015). Mobile phones and farmers' marketing decisions in Ethiopia. *World Development*, *68*, 296–307.

Thakur, D. (2017). Use of social media for livestock advisory services: The case of WhatsApp in Himachal Pradesh, India. *The Indian Journal of Animal Sciences*, *87*(8).

Tiwari, M., Chakravarty, R., & Goyal, J. (2014). Availability and accessibility of Information Communication Technology (ICT) among dairy farmers in Uttarakhand, India. *International Journal of Research in Applied, Natural and Social Sciences*, *2*(7), 47–52.

Yusuf, S. F. G., Masika P., & Ighodaro, D. I. (2013). Agricultural information needs of rural women farmers in Nkonkobe Municipality: The extension challenge. *Journal of Agricultural Science*, *5*(5), 107–120.