

Reaching the Millions: Accelerating Agricultural Extension Services Through Information and Communication Technologies (ICTS)

Muhammad Ali and Norsida Man

Department of Agriculture Technology, Faculty of Agriculture,
Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

Abstract: Agricultural extension is considered to be the main vehicle in transporting the valuable pieces of advises to the farming community. However, the pace of delivery can be increased by incorporating Information and Communication Technologies (ICTs). Extending and receiving desired information within less fraction of time has become priority and need of the hour particularly in this era of agricultural intensification. In fact, common farmers now want quick advisory services with less mobility. So, ICTs can be the appropriate solution in order to speed up the process of agricultural technology transfer. Moreover, extension services can be improved with the proper use of ICTs and help in poverty alleviation, combating food insecurity issue and exchange of agriculture innovations, reaching majority of the farmers at regional and global level. Relevant review of literature was adopted as desk research for this study. The crux of the reviewed literature revealed that the new nexus between extension and ICTs will lead to impact oriented extension and advisory services and feeding the million mouths.

Key words: Agricultural extension • Information and communication technologies • Agricultural education
• Agricultural social media

INTRODUCTION

Agriculture extension has been playing a significant role in the development of agriculture sector. Agriculture based technologies are being transferred to the diversified group of farmers and other people through extension and advisory services for their overall welfare [1]. Moreover anderson [2] defined agricultural extension and advisory services as “the entire set of organizations that support and facilitate people engaged in agricultural production to solve problems and to obtain information, skills and technologies to improve their livelihoods” (p. 6). According to Jones [3], agriculture extension has been recognized as important mechanism for transfer knowledge and advises as an input in the frame of advance farming particularly in the present situation. However, on account of escalating demand of food and nutrition at the global level, extension system needs transitions from traditional form of transfer to the modernized level. Chimiota [4] revealed that paradigm shift is required for extension services and land acquisition for farmers due to globalization and change in food economy.

Similarly, Agriculture extension programmes are important policy instruments for improving agricultural productivity in many developed and developing world so, this shift will lead to increase food productivity, income generation and ensure food security at macro level particularly furnishing the food demand of increasing population [5].

Pontius *et al.* [6] further described that information and knowledge dissemination are important factors which help in increasing agricultural progress through suitable production planning, adoption and management for speeding up the pace of development when properly used by the countries. Birkhaeuser *et al.*, & Feder *et al.*, [7, 8] also stressed that extension can be useful in improving productivity gap through fast technology transfer process and by knowledge improvement in farming community and helping them to better use farm management practices. In the context of adoption, Ochola *et al.* [9] hold the opinion that there should be strong linkages among various actors like extension, farmers and researchers as it would improve the level of adoption among farming community. Furthermore, extension agents who are the frontline force also need to

be prepared in advance. In this context, Saleh *et al.* [10] pointed out that important measures should be taken in advance to diagnose the training needs of extension agents and knowledge, skills and change in professional attitude among extension agents could lead to rendering their advisory services efficiently. However, Rashid *et al.* [11] conducted empirical study in Bangladesh to assess the impact of e-agriculture on livelihood of farming community and concluded that service providers should be professionally organized and facilitate farmers without any bias. In fact, extension services are and should be free of any linking or disliking which makes it farmers' friendly. Cutting it short, the present literature based study was designed to see how agricultural extension services can be improved in the context of ICTs for teaching, disseminating and reaching majority of farmers. It is hoped that the literature based results would eliminate misconceptions of potential role ICTs can play in triggering the agriculture extension process.

Research Methodology: The desk study technique was used to collect the relevant material. The relevant literature was reviewed from internet by putting keywords in search engine. The research papers of journals and pertinent stuff were gathered from Google scholar, science direct and other journals. As there were plenty of material on the internet, so quick to grasp technique was used in which papers were selected and studied on the basis of topic, abstract and conclusion. This step was followed by full material reading and reviewing. Finally, paper was written by following paraphrasing and proof reading. Therefore, entire review article is based on secondary data which were currently available.

ICTs and Agriculture Extension: Information and Communication Technologies (ICTs) have been emerging as panacea for many current agriculture technology transfer challenges but when and where grafted with existing agriculture extension system, will accelerate the process. Sanusi [12] revealed that currently agriculture extension professionals and their clients have started using novel electronic means to effectively conveying agricultural messages, exchanging information, managing the received agro based information and applying for better results, ultimately, this process will aid the farming community in all agriculture development aspects. In addition, Flor [13] highlighted the importance of merging ICTs with agriculture extension for effective technology transfer. Fountas *et al.* [14] stated that the key to success in this new age of agriculture is easy access to timely

information and rationale decision making. It should be promoted by extension workers and its use can be improved by conducting trainings so that access to information is improved for farming community [15].

Furthermore, Rehman *et al.* [16] opined that the application of modern innovative technologies can significantly affect the production in agriculture and would lead to sustainability. Shuck [17] concluded in the assessment report that it is expected that ICTs will be used by majority of Chinese farmers for acquiring latest agriculture information sooner than later, even if the cultural, political and economic landscape keep changing. However, government institutions have to sensitize the farmers about its potential usage. A study conducted by Michailidis *et al.* [18] in Macedonia and found that application of ICTs in agriculture was useful as farmers showed encouraging response. However, farmers were reluctant to abandon existing extension services as these were important to speed up the technology delivery mechanism. Therefore, ICTs might be incomplete without existing Extension and advisory services which are providing an appropriate path for agricultural development at rural and urban level. Behera *et al.* [19] expressed that agriculture extension system is now more relying on information technology (IT) in order to transfer timely information, suitable to the situation and area specific technologies to the farming community. So, IT is likely to be best technique to expedite agriculture extension system along with research expansion and development of education system. They further expected that in order to make history and achieving Vision 2050 of India, farmers' friendly and ICT based agriculture must be promoted.

Linking Social Media with Agricultural Extension: Use of social media in agriculture extension and advisory services has currently changed the traditional simple way of technology dissemination and interaction with the farmers to modernized form. Agriculture technology transfer through social media has tremendous potential to fill the gap which is being observed in farmers and extension ratio [20]. The recommended ratio by Food and Agriculture Organization for extension worker to farmers is 1:250 [21]. However, Nigerian Oyo state is having 1: 4, 882 ratios with farm families of 15,030, which is extremely under the requirement. In continuing to this issue in Nigeria, it was felt that this problem is not only in one state, rather the entire country is facing severe shortage of extension officers [22]. In contrast, according to Ihimodu [23], the situation was different in the past when there were less population and more extension agents

available in Nigeria, The author further revealed that there was wide gap in the extension farmers ratio in different states of Nigeria like in Niger state, it was from 1:500 to 1:5800 in Lagos State with average of 1:1986 at national level. On the other hand, Omokhaye [24] reported that in Nigeria, the main hurdle is not just the scarcity of technologies and scientific recommendations but more importantly, there is lack of appropriate information about the use of new technologies at the country level. Thus, this wide gap can be fulfilled by incorporating ICTs in agriculture extension and advisory services for expediting the technology transfer process.

Similarly, Phokaruna and Sirisunyaluck [25] opined that agriculture sector including both public and private sector has encouraged the use of social media in agriculture extension. The social media has been utilized in exchanging and transferring valuable knowledge and information like agricultural news and important data to the agrarians and other related players. As a result of this social media intervention, efficiency and production of agriculture products have been continuously increasing which depicts agriculture development at the national level. The importance of social media has also been highlighted by Udomsin [26] who stated that social media has changed the entire old frame which were having interpersonal communication, print media, audio-visual aids to the advanced form, which contains internet and other quick and convenient form of information technology. Among the newest and popular are emails, World Wide Web (WWW), Facebook etc.

CONCLUSION AND FUTURE DIRECTION

It can be gathered through the literature review that ICTs when embedded with agriculture extension services have tremendous potential to transform agriculture sector in order to gear up the dissemination process. Moreover, social media like what's up, viber, imo, facebook, twitter and many other useful forms of social media have remarkable potential to exchange agriculture information not only from extension workers to farm producers but also farmers to farmers linkages development to adopt innovative agricultural practices. Ultimately, food production can be increased, food security and nutrition management can be ensured at micro level and poverty alleviation and other longstanding issues can be resolved. In a nutshell, modernization of agricultural extension and advisory services is possible when ICTs are grafted for expediting the flow of agriculture technology transfer in order to contact millions of farming community at the global level.

REFERENCES

1. Waddington, H., B. Snilstveit, H. White and J. Anderson, 2010. The impact of agricultural extension services. Washington, DC: International Initiative for Impact Evaluation.
2. Anderson, J.R., 2007. Agricultural Advisory Services. Background Paper for the World Development report 2008. World Bank.
3. Jones, G. and C. Garforth, 1997. The History, Development and Future of Agricultural Extension; In: B. Swanson, R. Bentz and A. Sofranko (eds.). Improving Agricultural Extension: A Reference Manual. FAO. Rome.
4. Chimoita, L.E., 2014. Review of agricultural extension interventions in unlocking agriculture potential through medium sized farms, Kenya. University of Nairobi.
5. Abdullah, M., L.C. Xia, J. Li, S. Ghazanfar, Y. Mehmood, M.N. Ishaq and S. Saud, 2014. Effectiveness Comparison Between the Farmers Field School and the Training & Visit Approaches of Agricultural Extension in Two Districts of Pakistan. *American-Eurasian Journal of Agricultural & Environmental Sciences*, 14: 33-39.
6. Pontius, J., R. Dilts and A. Bartlett, 2002. Ten years of IPM training in Asia—from farmer field school to community IPM. FAO Community IPM Programme, Jakarta.
7. Birkhaeuser, D., R.E. Evenson and G. Feder, 1991. The Economic Impact of Agricultural Extension: A Review. *Economic Development and Cultural Change*, 39: 607-650.
8. Feder, G., R. Murgai and J.B. Quizon, 2004. The Acquisition and Diffusion of Knowledge: The Case of Pest Management Training in Farmer Field Schools, Indonesia. *Journal of Agricultural Economic*, 55(2): 221-243.
9. Ochola, W.A., E.A. Basweti, G.M. Ogendi, C.A. Onyango and W.O. Ochola, 2014. Relationship Between Level of Participation of Researchers, Extension Agents and Farmers in On-Farm Research Trials and Adoption of Technologies Case Study: Maize and Beans Producers, Kenya. *American-Eurasian Journal of Agricultural & Environmental Sciences*, 16(6): 1030-1036.
10. Saleh, J.M., N. Man and M.H. Salih, 2016. Methodology: Training Requirement of Agriculture Extension Officers in Iraq. *American-Eurasian Journal of Agricultural & Environmental Sciences*, 16(1): 60-69.

11. Rashid, S.M.M., M.R. Islam, M. Quamruzzaman, M. Yeasmin and M.J. Azad, 2016. Impact of E-Agriculture on Farmer's Livelihood in Bangladesh. *American-Eurasian Journal of Agricultural & Environmental Sciences*, 16(5): 976-983.
12. Sanusi, M.A., A.M. Petu-Ibikunle and C.M. Mohelia, 2010. The influence of ICT on the dissemination of Agricultural Information among urban farmers in Northern Guinea Savannah Zone of Nigeria. *African Scientist*, 11(2): 135-140.
13. Flor, A.G., 2002. Information and communication opportunities for technology transfer and linkages. Expert Consultation on Agricultural Extension, Research-Extension-Farmer-Market Linkages. FAORAP, Bangkok.
14. Fountas, S., G. Carli, C.G. Sørensen, Z. Tsiropoulos, C. Cavalaris, A. Vatsanidou, B. Liakos, M. Canavari, J. Wiebensohn and B. Tisserye, 2015. Farm management information systems: Current situation and future perspectives. *Computers and Electronics in Agriculture*, 115: 40-50.
15. Dimelu, M.U. and V. Anyaiwe, 2011. Priorities of smallholder oil palm producers in Ika local government area of Delta State: implication for agricultural extension service in Nigeria. *World J. Agric. Sci.*, 7: 117-123.
16. Rehman, A., L. Jingdong, R. Khatoon and I. Hussain, 2016. Modern Agricultural Technology Adoption its Importance, Role and Usage for the Improvement of Agriculture. *American-Eurasian J. Agric. & Environment. Sci.*, 16(2): 284-288.
17. Shuck, J.L., 2014. Assessment of Information and Communication Technologies in Chinese Agricultural Extension. University of California, Davis.
18. Michailidis, A., A. Marantidou, A. Koutsouris, A. Papadaki-Klavdianou and V. Samathrakis, 2008. Adoption of Information and Communication Technologies among Farmers in the Region of West Macedonia. In: *Proceedings of the International Advanced Workshop on Information and Communication Technologies for Sustainable Agri-production and Environment*, pp: 339-349.
19. Behera, B.S., T.K. Das, K.J. Jishnu, R.A. Behera, A.C. Behera and S. Jena, 2015. E-Governance Mediated Agriculture for Sustainable Life in India. *Procedia Computer Science*, 48: 623-629.
20. Thomas, K.A. & A.A. Laseinde, 2015. Training Needs Assessment on the Use of Social Media among Extension Agents in Oyo State, Nigeria. *Journal of Agricultural Informatics*, 6(1): 110-111.
21. FAO, 2012. Urban and Peri Urban Agriculture. Food and Agricultural Organization (FAO) of the United Nations.
22. Fmard, 2011. Agricultural Transformation Agenda-Nigeria: Report on Agricultural Extension Transformation. Federal Ministry of Agriculture and Rural development, Abuja. New Generation Books.
23. Ihimodu, I.I., 2002. Strategy for poverty alleviation among small-scale farm holders through participatory research and extension. A theme paper presented to the 14th Middle Belt Zonal Research-Extension-Farmer-Input-Linkage-Systems (REFILS) Workshop, held in Nigeria, pp: 23-26.
24. Omokhaye, S.B., 2000. Influence of Communication Channels on Farmers Utilization of Improved Cocoa Seed Technologies in Owan East Local Government Area of Edo State, Nigeria. Unpublished M. Sc. Thesis in the Department of Agricultural Extension and Rural Development, University of Ibadan.
25. Phokaruna, A. and R. Sirisunyaluck, 2015. Satisfaction Toward on Agricultural Extension by Social Media of Phokaruna Co., Ltd. in Chiang Mai Province. *Journal of Agricultural Technology*, 11(5): 1033-1046.
26. Udomsin, P., 2011. Public Relations in Agricultural Extension. Nonthaburi: Sukhothai Thammathirat Open University Press.