

Information and Communication Technologies for Rural Development in Developing countries

Abdul Razaque Chhachhar 1* Har Bakhsh Makhijani 2, Ghulam Mujtaba Khushk 3, Zulfikar Ahmed Maher 4

1, Department of Communication, Faculty of Modern Languages and Communication, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia. Email: abdulrazaquechhachhar@yahoo.com

2, Department of Media and Communication Studies, Faculty of Social Sciences, University of Sindh Jamshoro, Sindh, Pakistan.

3, Department of Social Science and Development, Faculty of Human Ecology, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

4, Information Technology Centre, Sindh Agriculture University Tandojam, Pakistan

Abstract: Information and communication technologies providing new access and approaches for rural development and different communities are getting benefit from these technologies, but still there is gap among rural people and communication technologies especially farmers of rural areas in developing countries have no proper access of such technologies to get latest information about market, weather, pesticides, commodity prices and new production of seed. However, such kind of technologies are creating and generating new practices and innovations for agriculture and education development in remote areas. In the context of the developing countries lack of knowledge among teachers and students have also effected in development of education. There is need to provide opportunities these communities and deliver the infrastructure in rural areas for making their lives easy. Such technologies should introduce primary school level and establish computer, labs and centres to provide access of internet. Furthermore, government and related agencies should provide trainings to farmers for agriculture development in remote areas of countries.

[Abdul Razaque Chhachhar, Har Bakhsh Makhijani, Ghulam Mujtaba Khushk, Zulfikar Ahmed Maher.

Information and Communication Technologies for Rural Development in Developing countries. *J Am Sci* 2013;9(9):83-88]. (ISSN: 1545-1003). <http://www.jofamericanscience.org>. 12

Keyword: information communication technologies education, agriculture and rural development.

Introduction

Information and communication technologies defines as a systematic way of transferring, storing, producing and recovering the material such things could be in text, videos, sounds images and pictures are related with information and communication technology. Files materials of data and other information can transfer by use of Internet and communication technologies in different areas of society. Nowadays people, groups, organizations government and different related groups of the society have been observed and proved by different projects and perception that the use of information and communication could improve and can bring the changes in the life of different people whose working in different sectors such as in education, health, rural development and in agriculture where such technologies adoption can improve the productivity, save the time, energy as well as money of people, groups and organizations by information communication technology (Rehman and Saba, 2012).

In developed nation Information and Communication Technology has impact in sector of life and provided lot of benefits and advantages to society. In the perspective of the India the extension services are proving the information in different communities by using information communication technology for

development especially in education and agriculture sector. Similarly in Ghana the same method was implemented in education and agriculture where the result was observed positive (Saba and Altameem, 2013; Sakyimr, 2012).

Last many years information and Communication technologies has brought a significant changes in economic development and by these technologies economy of the countries are growing gradually where different companies, groups and countries are getting advantage from these technologies. Information and Communication Technologies have reduced the cost of transport, reduced the barrier among countries and communities and has increased the trade and business all over the world similarly these technologies have improved the living standard of the millions of people (Bhagwati, 2004; Sachs, 2005; Stiglitz, 2002; Rehman and Saba, 2012).

Information and communication technology has brought revolutionary changes in education, health and agriculture sectors the investments of information communication technologies in education have also provides positive changes and improves the standard of education globally. By implementation of information and communication technology in education sectors make new ideas and creativity to produce innovative

things there is need to provide such facilities in developing countries for development of education (Saba, 2012; Jones, 2003; Kozma, 2003).

Information and communication technology is rapidly growing as most important tool for rural development in third world countries where most of the people are adopting these technologies for agriculture and education development. Furthermore, these communication technologies are spreading among small business (Grimes, 1992). Information and communication technologies have provided facilities in different organizations of economic activities. In this context the importance of this technology is such as application of computer networking and sharing information among communities is also main tool of communication technology (Arnbak, 1990).

In the perspective of rural development, it includes the financial, physical and human resources and for social as well as economic development of rural communities. The rural development can also described as the betterment and improvement the life of people. Furthermore, the rural development could be defined as rural areas categorized by a numbers of interrelating factors which influence against growing job opportunities which engage people moving out of cultivating and support to sustain demographic and community structure. However, rural development is approach to empower a particular group of poor people of the rural society to gain their want and need another definition defined the rural development concept which is the method to lead the sustainability and improvement of the poor people and their lives (Burkey, 2000, Grimes, 2000, Chambers 1983).

It was showed that the information and communication technology is more advance than traditional media such as radio and television. Radio and television were using last many years in field of education in distance education purpose and radio and television for agriculture development but such theologies have brought a very minor changes in these areas while ICT such as internet, computer networking have provided fruitful results, even though these technologies still are not famous and popular among communities and its utilization for both activities (Khodamoradi & Abedi, 2011).

Information and communication technologies tools last many years are connect with the education as well as different sectors of the society where people are getting benefit from this these advanced technologies in their fields. The initially government takes start to develop the country and make it more powerful in different sectors, on their first priority and make plan to introduce new technologies in their institutes and in departments, information and communication technologies one of the best tool of

making better approach for control save and enhance the capacity building of people (UNDP, 1994).

The differences between developed and developing countries are there is a gap of opportunities and access of communication technologies in developing countries in main applications and facilities of information and communication technologies in their areas especially in rural areas where people have no access and approach to use such technology and get the information about socio economic condition of different countries (Mardani, et al 2011; Saba and Rehman, 2012).

The use of information technologies especially in rural areas was very low and facilities of internet were not available in rural people which are very important tool for rural development. By use of information communication technology such as internet is more effective and important information can transfer and share to rural communities and by these information rural people can get good benefit and knowledge. Rural people can also get self-education and information about different things for instance, agriculture, health, pesticides and other related information (Pringle & David, 2002).

The main two ICT tools can adopt for the development of education, agriculture and health in different regions of developing countries in rural areas. One is mobile phone by this technology people can connect with each other and get information about market, health issues and discuss about new approaches in education. However, the second one is internet by this technology different communities can communicate and could obtain the information of different region online information about their agriculture products. In the perspective of India, Philippines, Thailand, Bangladesh and Pakistan business communities' farmers' organizations could share their experiences for using of new technologies for development in their rural areas. The most technologically advanced countries such Japan, South Korea and Australia have proved and implemented many different policies in the development infrastructure of information and Communication technologies and improved the capacity building of rural people. The mobile phone and internet have played a role of bridge and connected the communities and provided a choice at the national and international level for rural development (Singh, 2006). Different findings indicated that information and communication technologies have played a vital role different in countries for economic growth and poverty reduction similarly provided a new space for the investment in different regions.

Information and communication technologies (ICT), involved with traditional media and as well as computer technology which also include

internet which is nowadays powerful tool of transferring information and knowledge to different people and community. The information and communication could adopt for education and agriculture development similarly these communication technologies in trainings workshops to provide easy access to community (Gupta et al, 2004).

Information and communication technologies have been merged in different fields and these included such as internet, computer, email and mobile communication technology. Few decades before the role of mass media were focused on rural development and radio and television one of the best source of dissemination information among people and brought a social change but nowadays information communication technology has brought a revolutionary change in rural development where most of technological facilities are available but still there is lack of knowledge and information among communities have not provided fruitful results (Lie, 2012).

Particularly the mobile phones wireless and internet communication technologies were used by business and citizen communities for increase their relations among each other's it was showed that in 2004, around 945 million were used internet in all over the world. Moreover, the China is one of the largest mobile market sellers in the world. America, Japan, Germany and United Kingdom have around 1463, 763, and 51.6 million were in 2003 (Eurostat News Release, 2005).

The impact of information and communication technologies on rural areas can be specified in two ways such as how information communication technology can contribute to reduce the distance among urban and rural areas and secondly how information communication technologies can provide facilities to rural areas for improving their knowledge and skills (Grimes, 2000).

ICT and agriculture development

Agriculture is the backbone of the economy of the countries it was showed that more than half 60% of the population in Asian Pacific countries live in rural areas and depend on agriculture. Developing countries are facing many problems such as poverty, education, health and agriculture development issues and farmers have no information about the proper use of the pesticides as well as fertilizer in their crop. Similarly the participation among farmers created the gap. Nowadays information and communication technologies have brought close to communities and empower the sources to poor farmers of different regions and increased their knowledge and information about agriculture technologies and provide information about market, weather customers preferences as well as chance of bargaining with buyers (Singh, 2006).

Information and communication technology have no particular target to enhance the agriculture production in rural areas or improve their productivity. In rural areas mobile phones can also play important role in enhance the capacity of rural people especially farmers and contribute their production of agriculture on national level. Information communication technologies could develop and provided access in rural areas for the development of agriculture, education and health issues. By use of these communication technologies the poverty can be reduced the rural areas of developing countries. In the context of rural development it could improve by identifying the strong position of the rural family as the centre of agricultural production in areas of poverty. The remote areas communities are main source of agriculture production in developing countries. Agriculture cultivation and harvesting facilities can encourage the rural communities for more production while lack of infrastructure, financial problems and disaster are big issues of rural and many other issues have significant impacts on agricultural production at the household, local and nationwide levels (Richardson, 2005).

By the use of communication technologies and m government services the farmers can save the time, energy and money similarly they can connect to buyers for selling their product good and service. The mobile phone one of the best ways of communicates directly with market buyers and producers and could get information about weather, market use of pesticides and other agricultural related information from expert. Mobile phones and wireless technologies could use for dissemination the information at crucial time and can provide information regarding Tsunami as well as any crisis happen in rural areas (Ntaliani et al., 2008).

The practices of information and communication technologies tools could use for different projects for rural development and could promote the sustainable development in remote areas as well as by use of information communication technologies the poverty could reduce in developing countries. The use of information communication technologies can introduce new approaches and ideas among rural people. Farmers can use new technologies for agriculture development and same time for education purposes. By information communication technologies rural empowerment and participation atmosphere can be created for rural communities (Pade et al. 2006).

Information and communication technologies cannot be specified only in agricultural development but similarly can improve the life of rural people and enhance their knowledge and by these farmers can increase agricultural production. One of the ICT tool mobile phone can play vital role in the ability of poor rural communities to sustain and similarly increase

their agricultural production and cultivation activities (Richardson, 2005).

There is need to introduce new policies to make empowerment of farmers and should reduce the gap among farmers and research officers similarly there is also need to make the linkages between farmers and market. Furthermore, it was showed that researchers and farmers have very much gape therefore in these circumstances the information and communication technologies can reduce the gape among farmers and researchers and market. Information communication technologies most important tool is mobile phone by these farmers directly can obtain information from market about their goods and services and same time contact with metrological department for getting the weather information before starting the pesticides and fertilization in their crop (Singh, 2006).

The e- service can play important role in education trainings and adoption of these new technologies can increase education system in rural development. Similarly the agriculture development also involves with information communication technologies. Information and communication technologies access in remote areas of developing countries and availability of infrastructure can increase the knowledge of agricultural information and farmers directly contact to brokers in market. Furthermore, there is need to plan, growth and make innovative in farms and should get advantage from ICT and services (Sideridis, 2002, 2006b, 2009).

ICT and Education

Information and communication technologies in the context of education by many things and products education can spread through there are many things such as teleconferencing, email connecting system audio as well as video conferencing, radio, television and other methods can provide a lot of information from different regions of the world (Saba et al., 2012). Similarly information and communication technologies also can ICT can increase teaching, and administrative system of education. Information and communication technologies also improve the quality of education in remote areas of developing countries and could enhance the capacity of rural people in education which is better way for rural development. Different countries invest large of amount in development of different sectors in rural areas and improved the infrastructure but there is need to improve the education system of rural people. By information and communication technologies many new technologies can be introduced for the development of education (Saba et al., 2010). By applying the information and communication technologies high quality of education can adopt in remote areas of

developing countries (Hawkrige et al, 1990, Mackeogh, 2000, Ehrmann 1994).

The adoption of information and communication technologies tools in education can bring the revolutionary changes in the developed and developing countries these technologies can reduce the poverty and improve the living standard of rural people. Information and communication technologies could spread in rural areas similarly can introduce new ICT related courses in primary and secondary education system. Information and communication technologies access to education and information about health, weather, and use of pesticides can empower the rural society (Pade et al. 2006).

The practice of information and communication technologies can contribute and generate new thinking and approaches in all sectors of daily life. ICTs also provide viable, creation in the world similarly information and communication technologies have decreased old methods and provided an opportunities for everybody to access and can get information about education, health and development of agriculture as well as new innovations of the world (Jaffari, 2006).

Information and communication technologies are very important for developing countries by these technologies the education system can be improved and the access of such technologies can enhance the value of training and development of people and professionals in their particular areas. By using ICT lot of knowledge and information can share and disseminate among teachers and students of rural societies and can make different opportunities for rural people in developing countries. Furthermore, information communication tools can be adopted for increasing educational systems and expand policy formulations and applications of opportunities to work in a better way for education sector. One of the big problems of developing countries is poverty where poor people cannot afford the communication technologies tools for their use, even government cannot purchase such kind of expensive material and infrastructure in remote areas of their countries (UNDP, 1997; Ludden, 2005; Mehta, 2006). Information and communication technologies are one of the powerful tools for increase the educational system in developing countries and can provide easy access in formal and informal education system. The information communication technologies applications can also increase quality and strength the motivation and providing job opportunities and encouraging trainings and basic skills of instructor (Khodamoradi & Abedi, 2011).

There is no doubt that information and communication technologies have brought awareness, knowledge and information among farmers and farmers can utilise these technologies for the improvement of

the agricultural system for the rural development. These technologies increased agricultural production, processing and marketing and income of farmers (Opata, et al., 2011; Rehman et al., 2013).

Conclusion

Information and communication technologies growing day by day in developing countries and most of the countries are getting benefit from these technologies in different sectors of development. Still there is lack of infrastructure and facilities in rural areas have no given appropriate development in agriculture and education sectors. Information communication technologies can spread in rural areas for education development computer centres, computer labs can established in remote areas of developing countries where the trained teachers can transfer their knowledge and skills for the development of students and improve their skills. By using computer labs farmers directly can contact buyers and sellers for sell their goods and services lack of awareness and illiteracy also a problem among farmers most of them cannot use technologies. There is need for education of farmers regarding information and communication technologies and its uses that farmers can get information about market, weather pesticides and seed. In education sectors from primary level students should teach these courses for the increase the knowledge and information of students from basic. Teachers should provide trainings regarding ICT and its importance for rural development.

Corresponding Author:

Abdul Razaque Chhachhar. Department of communication, Faculty of Modern Languages and communication, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia. Email: bdulrazaquechhachhar@yahoo.com

References

1. Arnbak, J.C. (1990) Telematics - aims and characteristics of a new technology. In Telematics Transportation and Spatial Development, Soekkha, H.M. et al. (eds), pp. 1 1-20. VSP, Utrecht.
2. Ammar Jaffari, (2006). Sustainable Development Policy Institute," 53rd Meeting of the Study Group on Information technology and Telecommunication, July 2006. http://www.sdpi.org/training/53rd_meeting_of_study_group.htm#3.
3. Bhagwati, J. (2004). In defence of globalization. Oxford, UK: Oxford University Press.
4. Boateng Michael Sakyimr, (2012) Information and Communication Technologies in Ghana's rural development. Library philosophy and practice (e. journal), 1- 23.
5. Burkey, Stan. (2000). People First: A Guide to Self-reliant, Participatory Rural Development, Stan Burkey, 29-39. London and New-Jersey: Zed Books Ltd, 2000.
6. Chambers, Robert. (1983). Rural Development: Putting the Last First, Robert Chambers, 147. London: Longman, 1983. Chariar, V.M. (2005), "Rejuvenating Traditional Knowledge Systems of India" (unpublished).
7. Ehrman, Stephen C. (1994). responding to the Triple Challenge Facing Post-Secondary Education: Access, Quality, Costs, Report prepared for the OECD, International conference, December 14-16, and Paris.
8. Gupta, M.P., Prabhat Kumar and Jaijit Bhattacharya, (2004). New Paradigms and value Propositions in e-Governance in Government Online: Opportunities and Challenges. M.P. Gupta, Prabhat Kumar and Jaijit Bhattacharya, 77. New-Delhi, India: Tata McGraw Hill 2004.
9. Grimes, S. (2000). Rural areas in the information society: diminishing distance or increasing learning capacity? Journal of Rural Studies, 16 (1), 13-21.
10. Grimes, S. (1992). Exploiting information and communication technologies for rural development. Journal of Rural Studies, 8 (3), 269-278.
11. Hawkrige, D.; Jawoski, J.; and McMohan, H. (1990) Computers in the Third World Schools: Examples, Experiences and Issues, London: Macmillan.
12. Hawkrige, D.; Jawoski, J.; and McMohan, H. (1990) Computers in the Third World Schools: Examples, Experiences and Issues, London: Macmillan.
13. Jones, R. (2003). Local and national ICT policies. In R. Kozma (Ed.), Technology innovation, and educational change: A global perspective (pp. 163-194). Eugene, OR: International Society for Technology in Education.
14. Kozma, R. (2003). Summary and implications for ICT-based educational change. In R. Kozma (Ed.), Technology, innovation, and educational change: A global perspective.(pp. 217-240). Eugene, OR: International Society for Technology in Education.
15. Khodamoradi, S., & Abedi, M. (2011). The role of information and communication technologies (ICT) in rural development. Life Science Journal, 8 (2), 75-80.
16. Lie, R. (2012). Background Paper: ICT for Agricultural Development an exercise in interdisciplinary. Retrieved from

- <http://idao.cirad.fr/Documents/idao/ICT%20for%20agri%20dev-%20Rico.pdf>.
17. Ludden, David. (2005), Development Regimes in South Asia: History and the Governance Conundrum, *Economic and Political Weekly*, September 10, 2005: 4042.
 18. Mardani, H., Arjmandi, H., Tavakkoli, M., & Nazeri, M. (2011). The role of information and communication technologies (ICT) in rural development. *Advances in Environmental Biology*, 5 (9), 2977-2980.
 19. Mackeogh, Kay (2000) National Policies on the Cost Effective Use of New Information Technologies in Life Long Learning. In the proceedings of Council of Europe Workshop on Lifelong Learning for Equity and Social Cohesion: A New Challenge for Higher Education, Catania, and April 6 - 8.
 20. Mehta, Dinesh. (2006). Urban Governance: Lessons from Best Practices in Asia” In *New Public Management*, edited by Shah and J. Parth, 11. NewDelhi, India: Centre for Civil Society, 2006.
 21. Ntaliani, M., Costopoulou, C., & Karetzos, S. (2008). Mobile government: A challenge for agriculture. *Government Information Quarterly*, 25 (4), 699-716.
 22. Opata, P., Nweze, J., & Rahman, M. (2011). The place of information and communication technology in promoting agro-based enterprises in third world countries. *Journal of Agricultural Technology*, 7 (2), 207-214.
 23. Pade, C., Mallinson, B. and Sewry, D. (2006). An Investigation of Sustainable ICT projects in Rural Development. In *Proceedings of the 2nd Sangonet Conference on ICTs for Civil Society*. Johannesburg, South Africa, March 2006
 24. Pringle, I., & David, M. (2002). Rural community ICT applications: The Kothmale model. *The Electronic Journal of Information Systems in Developing Countries*, 8 (4), 1-14.
 25. Rehman, A. and Saba, T. (2012). Evaluation of Artificial Intelligent Techniques to Secure Information in Enterprises. *Artificial Intelligence Review*, DOI 10.1007/s10462-012-9372-9.
 26. Rehman, A. Alqahtani, S. Altameem, A. Saba, T. (2013) Virtual Machine Security Challenges: Case Studies, *International Journal of Machine Learning and Cybernetics*, DOI 10.1007/s13042-013-0166-4.
 27. Richardson, D. (2005). How Can Agricultural Extension Best Harness ICT's to Improve Rural Livelihoods in Developing Countries. *ICT in Agriculture: Perspectives of Technological Innovation*.
 28. Saba, T. and Altameem, A. (2013). Analysis of Vision based Systems to Detect Real Time Goal Events in Soccer Videos, *Applied Artificial Intelligence*, vol. 27(7), pp. 656-667.
 29. Saba, T. (2012). Blinds Children Education and Their Perceptions towards First Institute of Blinds in Pakistan, *International Journal of Modern Education and Computer Science*, Vol. 4 (1), pp. 50-60.
 30. Saba, T. and Rehman, A. (2012). Effects of Artificially Intelligent Tools on Pattern Recognition, *International Journal of Machine Learning and Cybernetics*, vol. 4(2), pp. 155-162.
 31. Saba, T. Alzorani, S. Rehman, A. (2012) Expert system for offline clinical guidance and treatment, *Life Science Journal*, 2012;9(4):pp. 2639 -2658.
 32. Saba, T. Rehman, A. and Danial, H. (2010) “Proficiency and Approach of Mathematics Teachers in the Application of Computers as Instructional Tool in Pakistani Schools” *Journal of Educational Research*, vol. 3(2): pp. 153-170.
 33. Sachs, J. (2005). *The end of poverty: Economic possibilities of our time*. New York: Penguin Press
 34. Stiglitz, J. (2002). *Globalization and its discontents*. New York: Norton.
 35. Singh, S. (2006). Selected success stories on agricultural information systems. *Asia-Pacific Association of Agricultural Research Institutions (APAARI)*, Thailand.
 36. Sideridis, A. B. 2006b. New ICT Concepts and Projects for the Development of Rural Areas: The project Bio@gro, in the proceeding of international conference Sustainable Management and Development of Mountainous and Island Areas”, Naxos, Greece.
 37. Sideridis, A. B., C. P. Yialouris. 2002. The impact of ICT in Agriculture, Food and Environment. *Next Generation Society: Technological and Legal Issues*, (A. B. Sideridis editor). *Proceedings of the 1st International HAICTA Conference*, Athens Greece.
 38. Sideridis, A. B. and E. Pimenidis. 2009. Mobile devices and services. *International Journal of Electronic Security and Digital Forensics*, 2(4): 335-444.