Impact of Information Communication Technology (WiMax) for Rural Development at Baramati-Pune

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***Abstract*:** In recent times, ICT is playing a role of catalyst in rural development. It is used in every aspect of information, management and governance of development. Therefore taking this information in mind present study raises some fundamental questions on the application of WiMAX for rural development with the help of case study.

***Keywords*:** *WIMAX, ICT, social ,economical development, Kisoks*

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Introduction

Application of ICT communication for development is not a new concept but the modern ICT technology like WiMAX is very powerful tool to consider using in the rural development. This paper also covers the review of literature and development of genesis of ICT projects and its applications in rural development.

Communication is a fundamental pre-requisite of all living beings. The development of human civilization is directly dependent upon refinement and growth of forms, mechanisms and quality of the contents of communication. Sociologically it is possible to construct both processes and structures of culture and society through communicational contents and networks (Sharma, R., 1997:5).

A characteristic feature of the Third World countries is that they are predominantly rural in character and their economy is agrarian and subsistence-oriented. The transformation of these countries by structural changed in the total society has been the major emphasis in all models of development. Communication is now one of the central issues in Third World countries like India where 72.22% (2001 census) people live in village.

Kumar A. (1995) has defined ICTs "as a range of electronic technologies which when converged in new configurations are flexible, adaptable, enabling and capable of transforming organizations and redefining social relations." The range of technologies is increasing all the time and "there is a convergence between the new technologies and conventional media."

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From the past studies it is proved that, Information and Communication Technology (ICT) has earned its reputation to be the key to information-flow for intensifying the development efforts in rural India and is being considered as an imperative strategy for achieving the goal of sustainable rural development (Cecchini. C. (2002), *Warana*). Application of ICT has the potential to improve living standards of people in remote and rural areas by providing important commercial, social and educational

benefits. By expanding the use of government services – ICT strengthens the livelihood opportunities for rural India (Anup Hazara, 2012)

With the background of rural development WiMAX at Baramati we are poaching to conduct the study. What is the role of WiMAX in the rural development? What is the application of WiMAX project at Baramati? In spite of the fact that much research has been undertaken on communication in Western countries, the peculiar problems of various communication networks operating in the transitional societies, such as India are yet to be located and analysed. The present study is only limited up to analyze the role of ICT i.e. WiMAX in the rural development at Baramati in general . For analysing the rural development through ICT following indicators are selected for measurement. These are a) human resource generation, b) crop production, c) livelihood, d) mobility, e) income and saving and f) agriculture allied activities.

Objectives of the Study

The main objective of this case study is the management of ICT for rural development through WiMAX pilot project at Baramati. With this main objective in mind the study has following other objectives.

- To find out social and economic changes after implementation of WiMAX in the Baramati, Katewadi experimental village.

Hypothesis

- Modern ICT tool WiMAX helps to increase agriculture production i.e. sugarcane, maize and wheat.

Introduction to WiMax

The WiMAX emerges as the quintessential answer to these problems, given its superior performance and lower costs as compared to the existing 4G technologies and futuristic Long Term Evolution (LTE) equivalents. WiMAX was developed for high speed wireless BB data access and is a 4G technology available today at 4G prices (Proviti, 2010).

Architecture ofWiMAX

- The WiMAX architecture supports structure of packet switched. WiMAX technology including IEEE 802.16 standard and its modification is suitable for IETF and Ethernet.
- WiMAX architecture allows decoupling and also sustained topologies for connectivity purpose like IEEE 802.16 radio specifics.
- WiMAX architecture offers flexibility to accommodate a wide range of deployment such as small to large scale. It offers licensed to unlicensed opportunity. WiMAX also supports urban and rural radio propagation. The use of mesh topologies make it more reliable. It is the best co existence of various models.
- WiMAX architecture offers various services and applications such as multimedia, Voice, mandated dogmatic services as emergency and lawful interception.
- WiMAX architecture provides a variety of functions such as ASP, mobile telephony, interface with multi internetworking, media gateway, delivery of IP broadcasting such as MMS , SMS, WAP over IP.
- WiMAX architecture supporting roaming and internetworking. It support wireless network such as 4GPP and 4GPP2.It support wired network as ADSL, MSO based on standard IETF protocols.
- WiMAX architecture also supports global roaming, consistent use of AAA for billing purposes, digital certificate, subscriber module, USIM, and RUIM.
- The range of WiMAX architecture is fixed, portable, nomadic, simple mobility and full mobility.

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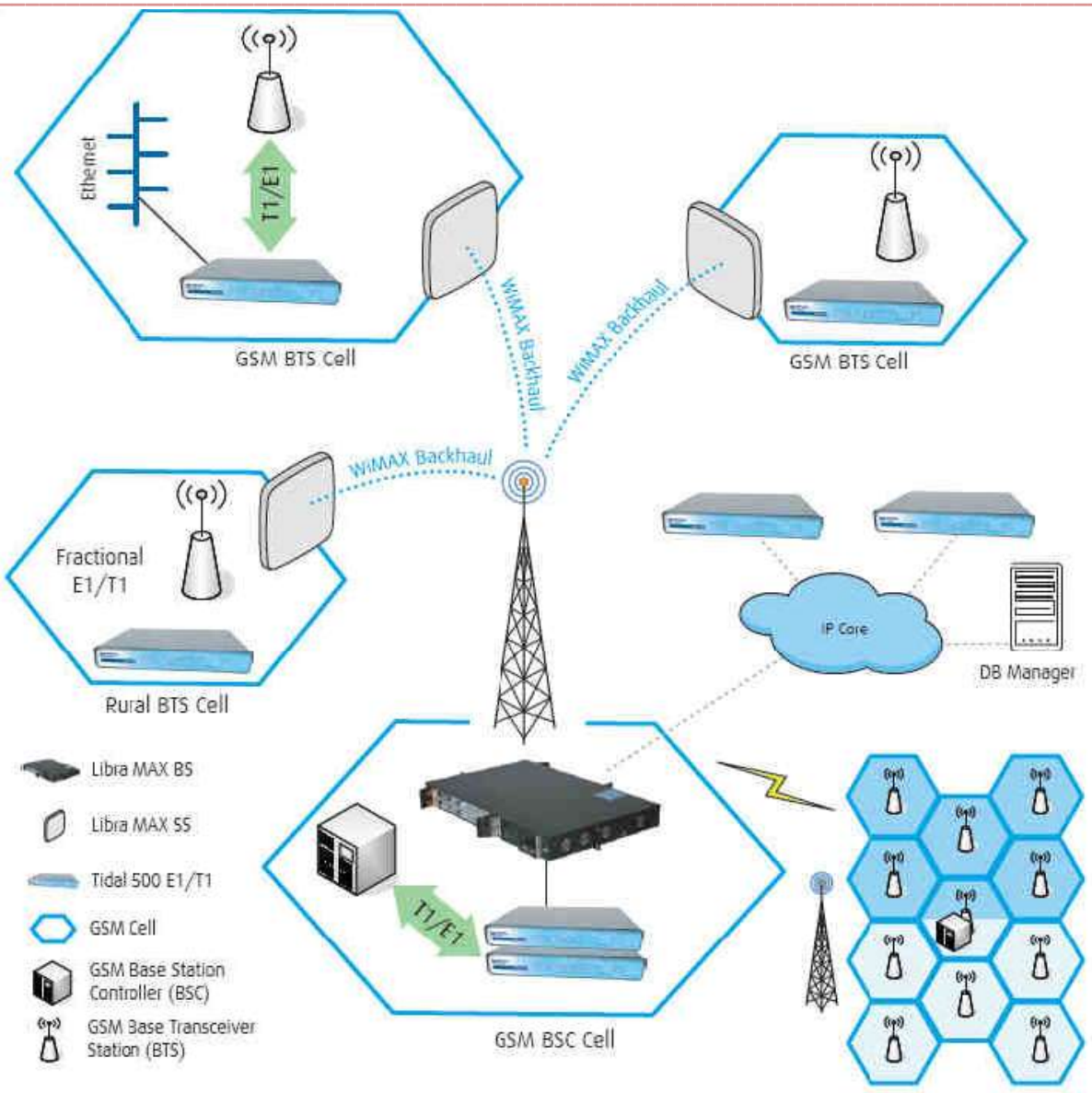

Diagram 1: Working of WiMax

Research Design and Universe of the Study

With regard to the nature of this kind of study, an experimental type of research design was used. As the present study has its focus on the, "ICT and Rural Development: Study of Wi-MAX Pilot Project Baramati.", here it is attempted to find the Baramati region in the Pune District was treated as the universe of study. The purposive sampling method is used to select two villages respectively as experimental and non-experimental villages i.e Katewadi and Zargadwadi.

Sampling Design

WiMAX Kisok is only running at the Katewadi village in Baramati though this village is selected for proposed study whereas for comparison similar nature village (i.e. Zargadwadi) near to Katewadi is selected by using following indicators. For the purpose of the proposed study two villages were selected. Out of that one village was selected as an Experimental village were 100 respodents (i.e.5%) were selected through quota sampling method and another was considered as a Non-Experimental village were 114 respodents (i.e.5%) are selected through quota sampling method.

Selection of the Sample Villages

Following strategy was adopted for the selection of sample villages.

a) Experimental Village:

i) Criteria for selection of experimental village.

1) The experimental village has to come under Baramati region.
2) The experimental village has successfully implemented the Wi-MAX Kisok.

ii) Selection Procedure of Experimental Village:

The WiMAX Project includes Kisoks in 5 villages in Baramti tahsil in Pune district. The present study is restricted to only Katewadi villages connected with WiMAX Kisoks were included for the selection procedure of Experimental village.

b) Non-Experimental:

For comparison and to examine the role of communication networks in development the researchers selected one Non-Experimental Village from Baramati region by using following procedure.

i) Criteria for selection of Non-Experimental village

1) Non-Experimental village should not be very far from Experimental village.
2) Non-Experimental village should be of the same socio-economic status and geographical conditions.
3) Non-Experimental village should not have implemented the WiMAX Project.

ii) Selection Procedure of Non-Experimental Village:

For the selection of Non-Experimental Village small survey to fulfill the criteria's for the selection of Non-Experimental village. After the survey researchers selected one village as a Non-Experimental village. The Non-Experimental village is Zargadwadi in Baramati tahsil.

Testing of Hypothesis "Modern ICT tool i.e. WiMAX helps to increase agriculture production i.e. sugarcane."

Paired t- test for testing is applied to analyse the hypothesis i.e. ICT tool i.e. WiMAX helps in increase average sugarcane production in Katewadi:

Let X = sugarcane production (per acre) in tons before WiMAX

Y = sugarcane production (per acre) in tons after WiMAX

Null Hypothesis:

$$H_0 : \mu_X = \mu_Y$$

i.e. there is no significant difference in the average sugarcane productions (per acre) in tons before and after WiMAX Kiosk.

Alternative Hypothesis:

$$H_1 : \mu_X < \mu_Y$$

i.e. average sugarcane production (per acre) in tons before WiMAX Kisok is less than average sugarcane production (per acre) in tons after WiMAX Kisok.

Test Statistic:

Under H_0, the test statistic is

$$t = \frac{\bar{d}}{S/\sqrt{n}} \sim t_{(n-1)}$$

where

$$\bar{d} = \frac{\sum_{i=1}^{n} d_i}{n};$$

$$d_i = X_i - Y_i; i = 1,2,\ldots, n.$$

$$S^2 = \frac{\sum_{i=1}^{n} (d_i - \bar{d})^2}{n-1}$$

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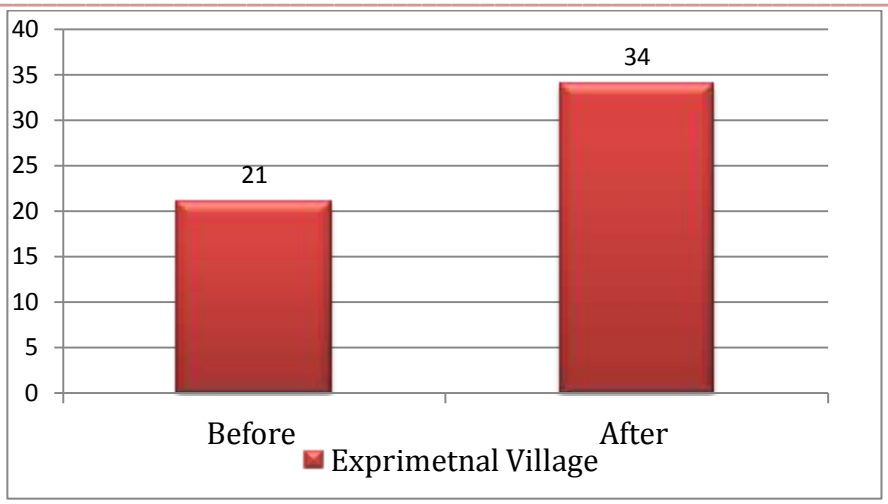

CHART 1: Differences in sugarcane production (Per acre) before and after WiMAX Kiosk.

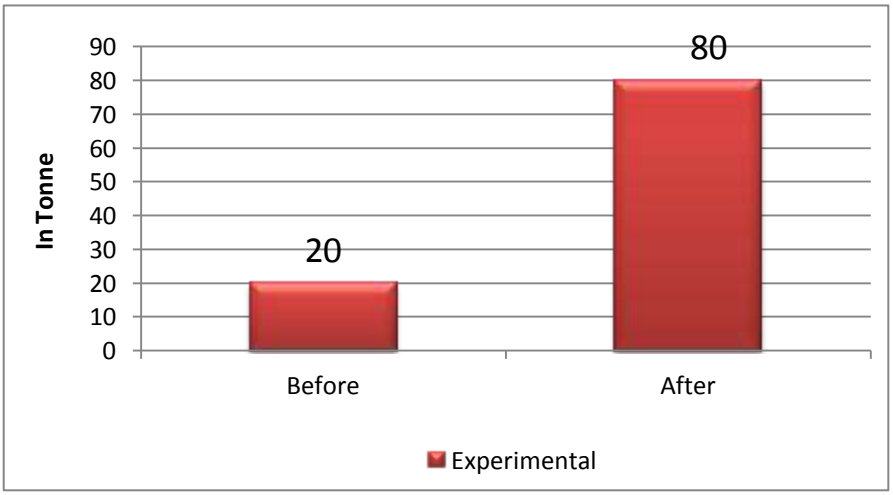

CHART 2: Differences in Wheat production (Quintals Per acre) before and after WiMAX Kiosk.

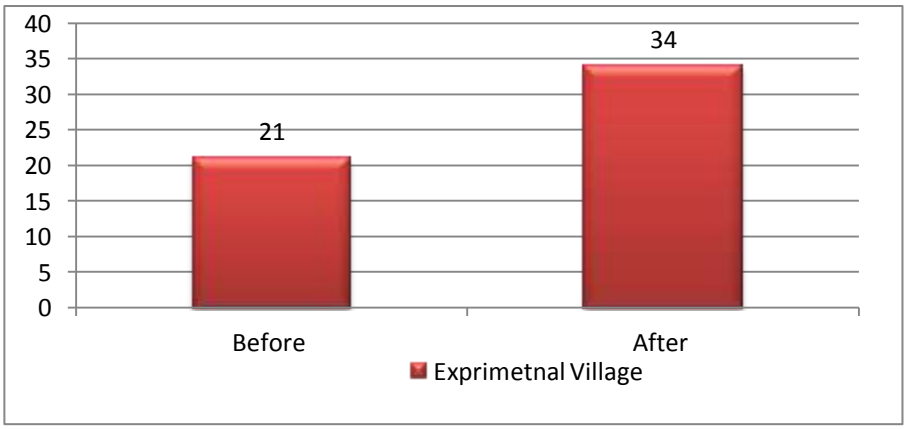

CHART 3: Maize production (Quintals Per acre) before and after WiMAX Kiosk.

CONCLUSION:

Modern ICT tool i.e. WiMAX helps to increase agriculture production i.e. sugarcane, wheat and maize. Agricultural sector, a prime pillar of Indian economy, which contributes around 25% of G.D.P. and 69% of labourforce, is engaged in agriculture and allied activities. In Baramati region sugarcane is considered as a major cash crop. Due to WiMAX it was found that, the production of sugarcane increased by 30 tonnes as compared to the past production. The above finding clearly proves that, WiMAX has helped to create positive atmosphere for promoting economic development which is faster, efficient and reduces inequality.

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