

ICTs and Empowerment of Indian Rural Women

What can we learn from on-going initiatives?



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List of Abbreviations

AIR	All India Radio
AMS	Adharsha Mahila Samaikhya
ANGRAU	Acharya NG Ranga Agricultural University
AMCUS	Automatic Milk Collection Unit System
aAQUA	Almost all Questions Answered
AGRISNET	Agriculture Information System Network
AGMARKNET	Agricultural Marketing Information Network
BAIF	Bharathiya Agro Industries Foundation
BPO	Business Process Outsourcing
BPL	Below Poverty Line
CSC	Common Service Centre
CRIDA	Central Research Institute for Dryland Agriculture
CRISP	Centre for Research on Innovation and Science, Policy
CSDS	Centre for the Study of Developing Societies
C-DAC	Centre for Development of Advanced Computing
COMBACCS	Cell phone operated mobile and communication and conferencing system
CR	Community Radio
DoA	Department of Agriculture
DIT	Department of Information Technology
DAC	Department of Agriculture and Co-operation
DMI	Dynamic Market Information
DDS	Deccan Development Society
DHAN	Development of Humane Action
DST	Department of Science and Technology
DRR	Directorate of Rice Research
DD	Doordarshan
DG	Digital Green
EDS, IT&C	Electronically Deliverable Services, Information Technology and Communication
FAO	Food and Agriculture Organisation
FIC	Farmers Information Centres
GCMMF	Gujarat Co-operative Milk Marketing Federation
GSMA	Group Special Mobile Association
GIS	Geographical Information System
GHMC	Greater Hyderabad Municipal Corporation
HMRI	Health Management and Research Institute
ICRISAT	International Crop Research Institute for Semi Arid Tropics
ICT	Information and Communication Technology
IT	Information Technology
ITES	Information Technology Enabled Services
IFAD	International Fund for Agricultural Development
ISRO	Indian Space Research Organisation
ITU	International Telecommunication Union
IVRS	Interactive Voice Response System
IMD	Indian Meteorological Department
ICRIER	Indian Council for Research on International Economic Relations
IFFCO	Indian Farmers Fertiliser Co-operative Limited

IKSL	IFFCO-Kisan Sanchar Limited
IAMWARM	Irrigated Agriculture Modernization and Water bodies Restoration and Management
InDG	India Development Gateway
ICT4RL	Information and Communication Technologies for Rural Livelihoods
IIIT	Indian Institute of Information Technology
IIT	Indian Institute of Technology
IGNOU	Indira Gandhi National Open University
ITC	Indian Tobacco Company
KCC	Kisan Call Centre
KVK	Krishi Vigyan Kendra
KSC	Knowledge Share Centres
KISSAN	Karshaka Information Systems Services and Networking
KCRS	Krishi Community Radio Station
MSSRF	MS Swaminathan Research Foundation
MDGs	Millennium Development Goals
MoA	Ministry of Agriculture
MoHRD	Ministry of Human Resource and Development
NGOs	Non Government Organisations
NeGP	National e-Governance Plan
NIC	National Informatics Centre
NAIP	National Agricultural Innovation Project
NKN	National Knowledge Network
PRADAN	Professional Assistance for Development Action
PPP	Public Private Partnership
PDS	Public Distribution System
RML	Reuter's Market Light
RKC	Rural Knowledge Centres
SMS	Short Messaging Service
SPS	Samaj Pragati Sahyog
SEWA	Self Employed Women's Association
SHGs	Self Help Groups
SCA	Service Centre Agency
SDA	State Designated Agency
STFC	SEWA Trade Facilitation Centre
TNAU	Tamil Nadu Agricultural University
TRAI	Telecom Regulatory Authority of India
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNDAW	United Nations Division for the Advancement of Women
UNPOPIN	United Nations Population Information Network
VKC	Village Knowledge Centres
VRC	Village Resource Centres
VLE	Village Level Entrepreneur
VS	Video SEWA
VASAT	Virtual Academy for Semi arid Tropics
WSIS	World Summit on the Information Society
WUA	Water User's Association

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Abstract

There has been a lot of interest during the last two decades in employing Information and Communication Technologies (ICTs) for achieving development. While many of these initiatives have benefited rural women by way of access to new information and new employment opportunities, women still face a number of constraints in accessing ICTs. This paper explores the role of ICTs in empowering Indian rural women, through a review of ICT initiatives in India. The paper concludes that, while most of the ICT initiatives are disseminating new information and knowledge useful for rural women, many are not able to make use of it, due to lack of access to complementary sources of support and services. Among the varied tools, the knowledge centres and the community radio were found to have the greatest potential in reaching women with locally relevant content. There is immense potential for ICTs to create new employment opportunities for rural women and to contribute significant gains in efficiency and effectiveness in rural women enterprises. While ICTs can play an important role in empowering rural women, women's access and use of ICTs and empowerment clearly depends on the vision and operational agenda of the organization applying the ICTs. Therefore, strengthening the ICT initiatives of such organizations can go a long way in empowering rural women. Besides generating locally relevant content and enhancing the capacities of rural women in accessing ICTs, efforts are also needed to bridge the different types of digital divide (rural-urban; men-women).

Executive Summary

There has been a lot of interest during the last two decades in realizing the potential of Information and Communication Technologies (ICTs) for achieving socio-economic development. This resulted in experimentation with various ICTs and its applications in areas such as agriculture, health, governance, financial services, education and employment. Many of these initiatives clearly reveal the huge potential of ICTs in improving efficiency and effectiveness of reaching rural communities with relevant information.

Though these initiatives have also benefited rural women by way of access to new information and new employment opportunities, studies have shown that women still face a number of constraints in fully benefiting from the potential of ICTs. This study has been primarily undertaken to document some of these experiences of using ICTs by rural women in India for accessing information, understand the key features of these initiatives and to assess how far this is contributing to their livelihood improvements. The approach was to do a desk review followed by interactions with key stakeholders involved in some of the ICT experiments.

ICTs do play an important role in disseminating a wide range of information and advice leading to knowledge and attitude change among rural communities. It is also supporting rural communities to acquire new skills and is also creating new employment opportunities. However, the continuing digital divide between urban and rural areas and between men and women currently constrain the realization of the full potential of ICTs in reaching rural women.

In general, there have been a large number of ICT experiments or pilots going on in the country. Though many of these pilots do provide important lessons on using ICTs for development, the scalability, sustainability and impact of many of these initiatives remain as matter of concern. Many ICT projects are dependent on donor funding and some are dependent on research project funding. Community models and business models in ICT deployment have both advantages and disadvantages. There is a case for targeting public funds to strategically support access of rural communities to information. Non-availability of locally relevant content and lack of local ownership have been other limitations.

Only a few ICT initiatives have tried to explicitly focus on reaching rural women. Out of the different ICTs, only community radio and rural knowledge centres were found to have an agenda and a mechanism for addressing the locally relevant information needs of rural women. But their effectiveness is closely dependent on the extent of ownership and management by women in these initiatives and the agenda, focus and vision of organizations employing these tools. Though community radio and Internet-enabled computers at rural knowledge centres offer greater scope for reaching rural women with locally relevant and demand led information, these initiatives are currently constrained by various factors. A review of performance on constraints to accessing relevant information through community radio and Common Service Centres (CSCs) would be highly relevant at this stage.

ICTs hold lots of promise for organizations working for the interests of women or having an explicit agenda for social inclusion, gender focus and pro-poor development. Strengthening the ICT capacity of organizations that has a history of working with disadvantaged groups, rural poor and women could be the best way of reaching rural women with ICTs. For taking the benefits of ICTs to rural communities, human intermediation is critical.

ICT-based enterprises have a potential to employ more number of rural women who are educated up to 10th or preferably 12th classes, in the lower end of the BPO sector. There are also opportunities to train some of these rural women for self employment in the IT sector (data management, DTP, as trainers).

Radio (All India Radio) and Television disseminate a wide range of information relevant to socio-economic development and these include agriculture, health, rural employment, environment, e-governance etc. Women who have access to these media have mostly benefited as passive recipients of generic information and advice. However, with addition of new programme formats such as phone-in-programmes, these media are now becoming more interactive.

In most of the other ICT initiatives that depend on print media, Internet kiosks, portals, call centres, mobile, video digital photography etc, there is not enough evidence to show its access and use by women. This could be due to the following reasons.

- These tools and their applications are generally deployed for disseminating information for rural communities without any specific attention for women's special needs for information and their constraints in accessing these.
- Men are specifically targeted in these initiatives as they take decisions on inputs, farm operations, marketing, accessing government schemes etc.
- The information provided through these tools are generic and so while it adds to the information base of rural communities including women, its lack of contextualization prevents both men and women from using this information effectively.
- Lack of adequate research on women's access to ICTs and the resultant lack of data constrain any specific action that might be needed to improve women's access.

Information needs of rural women as well as their ICT use vary widely. However, there is no ideal ICT that fits all situations. Though women are engaged in multiple roles in agriculture, they are keen to have information on other aspects, such as child health, nutrition, prevention and cure of common ailments, employment opportunities etc. Those trying to deploy ICTs for women empowerment should build their strategies based on ICT use pattern and varied information needs of rural women. Developing a dynamic and relevant content for rural women continues to remain as a major challenge. Sufficient resources need to be allocated for this activity, if benefits from resources invested in connectivity and hardware have to be fully realized.

ICTs have improved rural women's access to new information. However, many women don't have the required support (human networks and financial support)] and access to complementary set of knowledge and services to make use of this information. New information is necessary but not sufficient to bring about women empowerment. It is also interesting to note that those women who are part of other women-focused initiatives were able to make use of the power of ICTs better. Wherever, women are part of initiatives that are empowering rural women, they are able to benefit from these tools better.

Rural women are increasingly gaining in terms of employment in ICT-based enterprises. There is also clear evidence on women gaining by use of ICTs in their enterprises. ICTs do contribute to women empowerment, though its contributions vary significantly based on the tool used, for what purpose it is applied and by which agency. There is evidence, though

limited, to reasonably conclude that ICTs have the potential to contribute towards economic, social and political empowerment of women.

Most of the available evidence is anecdotal. To fully understand the developmental and empowerment implications of ICTs, further research is required. If women have to benefit from ICTs, special focus needs to be given in its application, otherwise like many other development interventions, women are likely to get sidelined. Enacting and enforcing gender-sensitive ICT policies therefore makes lot of sense.

ICTs and Empowerment of Indian Rural Women: What Can We Learn From On-Going Initiatives?

1. INTRODUCTION

1.1 Context

The contribution of information and knowledge in bringing about social and economic development has been well recognized globally. However, communicating this relevant knowledge and information to rural communities continues to remain as a major challenge even today, though the world has been better connected than ever before. The advent of new age Information and Communication Technologies (ICTs), especially, personal computers, the Internet and mobile telephone during the last two decades has provided a much wider choice in collection, storage, processing, transmission and presentation of information in multiple formats to meet the diverse requirement and skills of people. Donors, inter-governmental agencies, national governments, NGOs and the industry (IT and non-IT) during the last two decades have invested significantly in extending the reach of ICTs. Many of them have also experimented with its new and varied applications in promoting development and this includes areas such as health, agriculture, governance, financial services, employment and education.

The role of ICTs is recognized in Millennium Development Goal No. 8 (MDG8), which emphasizes the benefits of new technologies, especially ICTs in the fight against poverty. “With 10 percent increase in high-speed internet connections, economic growth increases by 1.3 percent” observed the recent World Bank report on Information and Communication for Development (World Bank, 2009). The same report also observed “connectivity -- whether the Internet or mobile phones -- is increasingly bringing market information, financial services, health services to remote areas, and is helping to change people's lives in unprecedented ways”.

While discussing ICTs, one should also need to look at the traditional ICTs such as radio, television and print media, and the emerging convergence of many of these with the new ICTs. We are currently witnessing a revolution in both the media as well as the ICTs. There is a vast literature on the potential and benefits of using these technologies for wider rural development. However, the contradiction between the potential for ICTs to address the

challenges faced by rural development and the current failure to harness them for this purpose is striking (Chapman and Slaymaker, 2002). There is an increasing realization that the digital divide -- the gap between those who have access to technology and those who do not -- is not merely technological. Besides a digital gap between women and men in society, there is a social divide among the information rich and poor in societies (Huyer and Mitter, 2003).

1.2 Background

Over the past few years, the Government of India, has invested heavily in strengthening the ICT infrastructure and has taken several policy initiatives to attract private sector investments in ICT infrastructure and service delivery. In response to this, access to ICTs has been growing at a higher rate. Consequently, the digital divide, in terms of access to mobile subscribers, fixed telephone lines and internet is getting smaller. As part of the National e-Governance Plan (NeGP), “a massive country wide e-infrastructure reaching down to the remotest villages is evolving and a large-scale computerization of back-end is taking place to enable easy and reliable access of public services over the Internet” (Government of India, 2009). The mid-term assessment of the Eleventh Five Year Plan accepts the existence of a digital divide in terms of the Internet and broadband connectivity between the urban and rural India and the need for policies to address this issue (Planning Commission, 2010).

A number of experiments, pilot projects and rural business initiatives on applications of ICTs in different sectors have been going on in India during the last two decades. Many of these initiatives have clearly revealed the huge potential of ICTs in improving the efficiency, effectiveness and reach of rural (as well as urban) service delivery and ensuring the much needed transparency in government and business. Studies have shown that some of these initiatives have also contributed to the empowerment of rural women (Nath, 2001, Gurumurthy, 2006, Arun et al 2004), even though, Indian women still face huge imbalances in the ownership and access to many of these technologies.

1.3 Purpose

The purpose of this report is as follows:

1. Document the experiences of rural women in India who use ICTs for accessing information and improving their livelihoods.

2. Understand the key features of the policy and business initiatives for enhanced communication through ICTs.

1.4 Approach

This report is primarily based on a desk review of experiences of using ICTs for women empowerment. The project team also undertook field visits to some select locations where ICTs are employed for empowering rural women and held consultations with some of those implementing these initiatives as well as rural women who are stakeholders in these initiatives.

1.5 Organization of this report

Some of the findings from studies dealing with ICTs, gender and women empowerment are discussed in section 2. The focus of section 3 is on ICT initiatives in India with special focus on those that attempted to reach rural women. This is followed by a discussion on the major lessons that were drawn from the desk review as well as field work in section 4. The report ends with a set of broad conclusions in section 5.

2. ICTs AND WOMEN EMPOWERMENT

2.1 What are ICTs?

ICTs generally refer to an expanding assembly of technologies that are used to handle information and aid communication. These include hardware, software, media for collection, storage, processing, transmission and presentation of information in any format (i.e., voice, data, text and image), computers, the Internet, CD-ROMs, email, telephone, radio, television, video, digital cameras etc. While radio, television and print media were primarily used to perform these tasks earlier, with the advent of the new ICTs, these have now been considered as traditional ICTs. However, many of these traditional ICTs are effective than web-based solution, as they can resolve issues such as language, literacy or access to the Internet (UNDAW, 2002).

The new ICTs are commonly referred to evolving applications or technologies that rely on the Internet, telecommunication networks, mobile phones, personal computers and databases. These new ICTs have the potential of getting vast amounts of information to rural population in a more timely, comprehensive, cost effective and interactive manner. With new applications emerging and the costs of owning and accessing technologies reducing, the world is witnessing a growing convergence in the technologies of broadcasting, communication and information.

2.2 ICTs and women empowerment

Empowerment is a multi-dimensional social process that helps people gain control over their own lives. Women empowerment generally refers to the process by which women enhances their power to take control over decisions that shape their lives, including in relation to access to resources, participation in decision making and control over distribution of benefits. Women's empowerment has five components: women's sense of self-worth; their right to have and to determine choices; their right to have access to opportunities and resources; their right to have the power to control their own lives, both within and outside the home; and their ability to influence the direction of social change to create a more just social and economic order, nationally and internationally (UNPOPIN, 2010). Though empowerment is an

important approach taken up by a number of international and national agencies, few of them share common definitions and most of them have different interpretations of empowerment (Scrutton and Cecilia, 2007).

Broadly speaking, there are three types of women empowerment:

- *Economic empowerment:*
Women are economically empowered when they are supported to engage in a productive activity that allows them some degree of autonomy. This type of empowerment is also concerned with the quality of their economic involvement, beyond their presence as poorly paid workers.
- *Social empowerment:*
This is a process of acquiring information, knowledge and skills; and supporting participation of women in social organizations without any gender discrimination in day-to-day activities. It is also concerned with inculcating a feeling of equality instead of subordination among women.
- *Political empowerment*
It is concerned with enhancing the power of voice and collective action by women. Besides, it ensures equitable representation of women in decision-making structures, both formal and informal, and strengthen their voice in the formulation of policies affecting their societies.

As gender inequality is embedded in a series of systemic inequalities, there is a need to employ different types of empowerment (McLaren, 2008). Economic, social and political empowerments are all inter-related and all these are critical for women empowerment, though the emphasis vary during different stages in the empowerment process.

The World Summit on the Information Society (WSIS), held in 2003 in Geneva, saw ICTs as vital tools for women's empowerment: "We are committed to ensuring that the Information Society enables women's empowerment and their full participation on the basis of equality in all spheres of society and in all decision-making processes. To this end, we should mainstream a gender equality perspective and use ICTs as a tool to that end" (WSIS, 2003).

Globally, there is an increasing body of evidence that shows how the rapid proliferation of ICTs is contributing positively to women's socio-economic empowerment (Aitkin, 1998, Melhem and Tandon, 2009). A range of ICT models have been used to support the empowerment of women all over the world and there is evidence to show that ICTs have improved women's access to information, provided new employment, created new class of women entrepreneurs and improved their access to government (Nath, 2001, FAO, IFAD and World Bank 2008). The specific uses of ICTs for gender agricultural development include the following: (a) empowering women to access knowledge and information; (b) offering better decision support; (c) improved access to market information and services, creation of new employment; (d) facing HIV/AIDS crisis; (e) and developing entrepreneurship (Pade et al, 2005). While there is recognition of the potential of ICT as a tool for the promotion of gender equality and the empowerment of women, a "gender divide" has also been identified, reflected in the lower numbers of women accessing and using ICT compared with men (UNDAW, 2005).

2.3 Gender and ICTs

Though ICTs offer considerable potential for reaching women with relevant information and services, women's ownership and access to ICTs is low, as in most other sectors. Their use continues to be governed by existing power relations whereby women frequently experience relative disadvantage (Gurumurthy, 2006). Rural women face significant disadvantages in information, communication, transactions, access to services, access to skills and education, access to earning and employment opportunities and "voice". Despite much support for the diffusion of ICTs in rural areas, gender disparity in access to ICT services continues, much to women's participation (FAO, IFAD and World Bank 2008). There is a growing agreement that the impact of ICTs in developing countries is not gender neutral, necessitating an engendered approach (affirmative direction to include gender concerns and realities) to ICT based projects (Arun et al, 2004).

"Comprehensive sex disaggregated ICT data across many countries do not currently exist. However, the data on access to and use of ICTs that are available indicate that women's participation in the information society, particularly in the poor countries of the world, lags behind that of men. Even when women and men have equal access to the Internet either through home, work or school, women may not have the opportunity to access the Internet

(Tracey et al. 2003). In Gujarat, men used mobile phones more frequently than women. Men also used public kiosks more frequently than women and they also travelled to access phones more often. The study found that social norms and financial considerations probably have some impact in the differences found (Souter et al, 2005). Another recent study also revealed the existence of a significant gender divide in access to telephones in India (Zainudeen et al, 2010).

Despite the lack of gender-specific quantitative data, project-level qualitative data have established that ICTs are not gender neutral. What is not known, though, is the magnitude of this divide, its evolution, and its many nuances—all are matters of importance for the design, implementation, and evaluation of programs. However, the issue of the gender divide is much broader. “Even in countries where access is no longer much of an issue and penetration is high, inequalities in actual use can hamper women’s development opportunities on both the economic and social fronts” (Hafkin and Huyer, 2007).

While discussing gender digital divide, we refer to several divides: in access, in usage, in content’s availability, in content’s utility, in IT labour markets, in contribution to IT industry and in access to ICT education at all levels, from primary to higher education, with focus on access to Science and Technology fields (Melhem and Tandon, 2009). ICT usage and consumption may simply mirror pre-existing gender differences that have been engrained for centuries and are likely need to be addressed in other areas of reform before ICT equity can be addressed fully.

Personal ownership of ICT for the vast majority of women in developing countries is not feasible for the foreseeable future, which implies that the question of where and how they can gain access to ICT becomes centre to the knowledge networking processes (Nath, 2001). Primo (2003) explains that women’s access to ICT depends on how many of the same ICTs are available in the household, for instance, if a household has one radio, then it is most likely to be owned and accessed by the man. The same idea can be applied to phones, where if one mobile phone is available to a household, it is the man who is most likely to have access to it (man most likely carry it around with him when he is out of the house).

Though telecentres, especially those managed by women or establishment of similar facilities within community based organizations provide potential solution to this problem, in reality,

this hasn't helped much. Among the factors that constrain women's use of telecentres are the following: heavy workloads and multiple roles that limit the time available to use a telecentre; male attitudes towards women's use of technology and to women visiting a mixed-sex public facility; the lower educational levels of women compared with those of men; and lack of disposable income to spend at fee-paying centres (Hafkin and Taggart, 2001). Experience from across the world also indicate that women are not using computer-based facilities at telecentres, but rather concentrate on using the telephone, fax and photocopiers (Gurumurthy, 2006).

Rapid spread of mobile phones in developing countries have contributed substantially to the reduction of digital divide, something other ICTs such as computers have not yet managed to do (Samii, 2010). However, a detailed global study on women mobile subscribers in low and middle income countries such as Kenya and India revealed the existence of gender gap in mobile usage. The study shows that a woman in low and or middle income countries is 21% less likely to own a mobile phone than a man (GSMA, 2010).

Box 1: Socio-cultural factors governing women's access and use of ICTs

- Cultural attitudes discriminate against women's access to technology and technology education: what would a woman farmer want with a computer?
- Compared to men, rural women are less likely to own communication assets, such as a radio or mobile phone.
- Rural women are less likely to allocate their income to use in public communication facilities, except when they need to communicate with family or to arrange for income transfers.
- Rural women are often reluctant to visit "cyber cafes" or public internet centres, which are often owned by men and visited by men. The café culture often excludes girls and women from frequenting them.
- Rural women's multiple roles and heavy domestic responsibilities limit the time they can allocate to learning and using ICTs until and unless they realize the potential information benefits and time-saving elements of using these technologies.

Source: FAO, IFAD, World Bank, 2008

What is increasingly clear is the existence of a gender digital divide, which can only be addressed through enacting and enforcing gender sensitive ICT policies. However it is also pertinent to mention here that ICT is not an answer to all the constraints being faced by women. "If however, the gender dimensions of ICT -- in terms of access and use, capacity building opportunities, employment and potential for empowerment -- are explicitly identified and addressed, ICT can be a powerful catalyst for political and social empowerment of women and the promotion of gender equality"(UNDAW, 2005).

3. ICTs AND RURAL DEVELOPMENT: INDIAN EXPERIENCE

India has been a major hub for rural ICT experiments for more than two decades. Many of these initiatives have clearly revealed the huge potential of new ICTs in improving efficiency, effectiveness and reach of rural (as well as urban) service delivery. They also highlight the scope in ensuring the much needed transparency in both government and business. But before we go into the details of new ICTs, it is pertinent to briefly discuss about India's long experience of using some of the traditional ICTs in bringing new technological information on agriculture and other allied subjects to rural communities.

3.1 Traditional ICTs

3.1.1 Radio

India's post-independence experiments with ICT in agricultural development started with radio (Ghosh, 2008). The government established a network of All India Radio (AIR) stations across the country to broadcast programmes in regional languages. "Farm and Home" units were established in AIR in 1965 to communicate specifically on agriculture and related technical information. Some of the stations also started a programme 'Farm School on AIR' that teaches farmers a complete course on a subject of relevance in different episodes. AIR (now *Prasar Bharati*) today has 231 stations in its network which virtually covers the entire country in terms of both population and geographical area.

Farm & Home programme of AIR not only provides information about agriculture but also create awareness about the ways and means to improve the quality of farmer's lives (Sasidhar et al, 2008). The programmes are broadcasted daily in the morning, noon and evening. The average duration of Farm & Home broadcast is 60 to 100 minutes per day. Farm & Home programmes also include programmes for rural women, rural children and rural Youth.

AIR has stepped up its agricultural broadcasting activities with the launch of exclusive project "Mass Media Support to Agriculture Extension" with the title *Kisan Vani* for AIR from 15th February, 2004 in collaboration with Ministry of Agriculture (MoA) to inform local farmers the daily market rates, weather reports and day-to-day activities in their area at micro level. Presently, "Kisan Vani" is being broadcasted from 96 FM stations of AIR, 5-6

days a week. A feedback survey on KisanVani found that “the majority of the listeners (83.2%) found the information broadcasted under Kisanvani programme adequate in terms of its contents. Similarly, a majority of the farmers (81.2%) opined that the information given was easy to understand and 43.5% farmers felt that information could be practised/adopted”. (Prasar Bharati, 2006).

The programme directed to women listeners cover subjects related to socio-economic development of women, health and family welfare, food and nutrition, scientific home management, women entrepreneurship, education, including adult education, gender issues etc. Besides this, the problems in general faced by women and the need for change in social attitude towards women also form an integral part of the general broadcast. Special programmes as well as general audience programmes are being broadcast focusing on the issue to change social attitude and behavioural practices towards women. For instance, the Saturday programme for women called “*Ponthottam*” by AIR Madurai focus on self help groups, health and sanitation, education and rural employment. The thirty minute programme “*Madhar Nigazhchi*” broadcasted by AIR Coimbatore twice a week deals with different kinds of issues faced by women.

The expansion of television in the 80s and the flourishing of satellite television channels during the 90s, impacted the popularity of radio to some extent. But with the spread of Rural FM Radio stations and the recent spurt in Community Radio, the Radio is staging a brave comeback. While the phone-in-programmes such as “Ask the Expert” has made Radio more interactive, expansion of community radio stations in recent years has made this medium more locally relevant. We hope to see broadcasting of more imaginative and locally relevant programmes through radio in the coming days.

Radio is widely used for distance education in India. *Gyan Vani* is an educational FM Radio Channel, operating through FM stations from various places in the country. It is a joint venture of Ministry of Human Resource Development and Ministry of information & Broadcasting, Prasar Bharti and IGNOU (the nodal agency). Currently there are 27 such FM radio stations, devoted exclusively to education and development through regional production and broadcasting across the country (MoHRD, 2010). An evaluation study found that 40% of the students listen to IGNOU programmes broadcasted through *Gyan Vani* (CSDS, 2008). At present, 184 radio stations across the country broadcast interactive phone-in counselling

every Sunday (4.00 p.m. - 5.00 p.m.). The students participate from their home through toll-free telephone to interact with the experts at various radio stations.

3.1.2 Television

“Doordarshan,” the government television has been playing an important role in communicating rural and agricultural news and information to rural communities. Doordarshan currently reaches 92 percent of the Indian population through a network of 1,414 terrestrial transmitters. It telecasts programmes on agriculture, rural development, women, children, family welfare, adult education, youth, civic sense and public awareness, science & technology and also telecasts special programmes during natural calamities such as flood, earth quake, epidemics etc. The DD National programme also telecasts 30-minute agricultural programme, *krishi darsahn*, in Hindi, six days a week. Its content includes features, documentaries, success stories of farmers, research inputs, quizzes, crop seminars and a live phone-in programme. It covers various aspects of agriculture and related activities such as horticulture, animal husbandry, dairy and rural life. The narrow casting kendra’s produce locally relevant programmes in local language and dialect and these 30-minute programmes are telecasted 5 days a week. Doordarshan’s popular health magazine programme – ‘Kalyani’ – funded by the Health and Family Welfare Ministry has been successful in creating health awareness about malaria, tuberculosis, reproductive health issues, tobacco and alcohol use, sanitation and hygiene, and HIV/AIDS (Box 2).

Box 2: *Kalyani* - A success story

Kalyani, a programme on health communication in India, is telecast over Doordarshan in nine of the most backward and populous states of India in 3 languages and 14 dialects, targeting approximately 50% of India’s population. The programme over the last nine years has been significantly advocating behavioural change on health related issues by generating awareness on particular diseases, creating avenues to question and debate traditional norms and practices through discussions in the programme. This 30-minute programme is telecasted twice a week. Research has shown that “61.2% of Kalyani viewers are females and 38.17% of them don’t own a TV set. The programme has made tangible impact, both in the cognitive (knowledge) and affective (attitude) domains. Exposure to Kalyani resulted in knowledge gains on the diseases covered, their prevalence, symptoms, precautions to be taken and, cure” (GFK Mode, 2009). Kalyani clubs (viewer groups) – a key component of the media strategy – have village-level members, who take the messages further by organizing local activities, such as cleaning up ponds and streets, or organizing eye and blood donation camps. Currently, there are nearly 80,000 Kalyani club volunteers. It is estimated that Kalyani reaches almost 500 million viewers across the country

Ministry of Rural Development has recently decided to have a dedicated TV channel, which would focus on programmes relating to agriculture, water, and sanitation issues, amongst others. The ministry is currently working out the modalities in close co-ordination with the ministry of information and broadcasting for launch of the dedicated TV channel

Some of the private television channels have also entered into special telecast on agriculture. For instance, Eenadu TV in Andhra Pradesh has two programmes on agriculture. Since December 2003, “*Jai- Kisan*” is telecasted daily in the evening (6.30-7.00 PM) on ETV-2. Since 1996, E-TV *telugu* has been telecasting “*Annadata*”, a programme on farming every day in the morning (6.30-7.00 AM) and this has been one of the most popular farm programmes in Andhra Pradesh. Most of the private TV channels in Kerala telecast 30-minute agricultural programme in Malayalam every week. *Kissan Krishideepam* produced by the Indian Institute of Information Technology and Management, Kerala (IIITM-K) for the Department of Agriculture (DoA), Kerala, is telecasted in Asianet channel thrice a week (including two repeat telecast). The project has launched the country’s first online video channel in Agriculture. More than 150 full length selected videos (telecast quality) were made available through the channel (www.youtube.com/kissankerala). *Bhoomigeetham* (Kairali TV); *Harithabharatam* (Amruta TV); and *Harithakeralam* (Jeevan TV) are the other weekly agricultural programmes telecasted in *malayalam*. Television channels in Tamil Nadu also telecast agricultural programmes. For instance Podhigai TV has a weekly programme called *Pon Vilayum Bhoomi* and Makkal TV has a similar programme called *Malarum Bhoomi*.

Television is also used to support distance education. Gyan darshan is an exclusive educational television channel of India set up by IGNOU, MoHRD and Prasar Bharti. It provides a blend of core curriculum based programmes in the area of primary, secondary, higher, distance, technical and distance education.

3.1.3 Print Media

Organised attempts to use print media for extension work started with the initiation of Farm Information Bureaus/Information Units in the state DoAs. Almost all state line departments, especially the DoAs, bring out farm magazines, in respective state languages. The Indian Council of Agricultural Research (ICAR) state agricultural universities (SAUs) and Farm

Information Bureaus of state DoAs are also bringing out farm magazines. While circulation of many of these public sector farm magazines is poor, several farm magazines from private media houses have successfully improved their circulation during the past few years. For instance the *Annadata* farm monthly journal from Vasundhara Publications in *telugu* has an average circulation of about 150,000 copies. The annual subscription for this magazine costs Rs.120. *Adike Pathrike* is a monthly farm magazine catering to the information and motivational needs of farmers and agriculturists in parts of Karnataka and Northern Kerala. The magazine is based on the philosophy of farmer-to-farmer communication and farmer participation in the generation of information. Kerala has two successful farm magazines, *Karshakasri* and *Karshakan* published by two media houses, Malayala Manorama and Rashradeepika respectively.

Newspapers (especially local language dailies) are one of the important sources of information for farmers. According to the New Delhi-based Indian Newspaper Society, India has more than 62,000 newspapers, with a staggering 90% of them in local languages. Most of the regional language dailies devote at least one page every week for news and articles on different aspects of agriculture. However, India has one daily on agriculture, Agrowon, in Marathi published from Maharashtra (Box 3). Agrowon has a circulation of 100,000 copies and the readership is estimated as 15,00,000.

Box 3: Agrowon-world's first ever daily on agriculture

Agrowon, the Marathi daily on agriculture was launched in 2005 by Pune based Sakal Media. The objective of this daily was equipping farmers with factual information and the latest technology to make them globally competitive, and help them increase their income levels. This 16 page daily has now eight editions which cater to eight different agro-climatic zones. Each zone has a different mix of crops, which also changes the way people live and the kind of information they seek. Though Agrowon uses the Sakal network for distribution, it is an independently priced daily, currently priced at Rs 2. With a current circulation of 100,000 copies, Agrowon has managed to create a bank of advertisers separate from the mainstream, 80 percent of the revenue coming from core agricultural products (Afaqs, 2010). Apart from news on prices in different markets (within the state and outside) and schemes of various government departments for farmers; the paper covers cultivation practices in different crops; better management practices in dairy, poultry and fisheries; success stories; and answers to farmers questions. The paper has now gone online with an e-edition that focuses on second-generation farmers.

Khabar Lahariya, a weekly newspaper based in Chitrakoot, Madhya Pradesh managed by all women staff from marginalised communities and printed in Bundeli, the local language has a

readership of 35,000 in 400 villages. Kerala has several magazines for women. *Vanitha*, *Mahilarathnam* and *Gruhalakshmi* are some of the most popular women magazines in Malayalam and these magazines cover several issues related to women such as education, employment, career planning, health and nutrition and child care

As per 2001 Census, the rural female literacy rate in India is only 46.70% and therefore a majority of rural women are not able to fully utilise this media for gaining information. However there is a wide variation among states in this regard and there is a lot of potential for using print media in those states and districts where female literacy levels are higher.

3.2. New ICTs

The new ICTs are those that rely on the Internet, telecommunication networks, mobile phones, personal computers and databases. The country has made significant progress in strengthening its ICT infrastructure during the last few years. (Box 4 and 5).

Box 4: India's expanding telephone and internet access

India has the second largest network with 723.28 million telephone connections at the end of September, 2010. The rural areas in the country have experienced rapid growth in telecom services and the tele-density (defined as the number of persons per hundred owning a telephone connection) has risen from 21.16 percent in December 2009 to 60.99 percent in September 2010.

The total number of rural connections at the end of September 2010 was 236.21 million compared to 47 million at the start of the Eleventh Plan. As on September 2010, 5.69 lakhs of village public telephones (98 percent) have been provided. Despite the rapid growth of mobile telephony in recent years, rural tele-density in India continues to lag far behind urban rates. The latest figures released by the Telecom Regulatory Authority of India show that tele-density in rural India was 28.42 in September 2010, compared to 137.25 for urban areas

As on September 2010, the Internet subscriber base stood at 17.90 million, out of which the number of Broadband subscribers was 10.31 million and the share of Broadband subscription in total Internet subscription was 57.6 percent. The number of subscribers of public and private ISPs stood at 12.53 million and 5.36 million respectively.

Source: TRAI (2011)

India is currently one of the biggest IT capitals in the world. IT and ITeS (IT-enabled services) exports have increased from US \$31.1 billion in 2006-07 to US \$46.3 billion in 2008-09, an increase of about 49 percent. Direct employment in IT-ITeS Sector has increased

from 1.62 million in 2006-07 to 2.20 million in 2007-08, a net addition of 0.58 million over last two years (Planning Commission, 2010).

Box 5: Enhancing Connectivity, Knowledge flows and Access to Government Service: Recent Initiatives by the Government of India

National Informatics Centre (NIC) has set up a country-wide communication network 'NICNET' as the backbone network infrastructure for Government informatics, providing linkages to 611 districts covering 35 States and Union Territories. The National Knowledge Network (NKN) initiative that provides multi-gigabit connectivity to all knowledge institutions in the country is also being implemented by NIC.

Activities related to Human Resource Development have been undertaken to ensure availability of trained human resource for the IT sector. Government has announced the National Skill Development Policy which has set a target of skilling 500 million by 2022. Department of Information Technology (DIT) has been identified as one of the agencies to implement skill development initiative in IT sector.

A network of over 100,000 Common Service Centres (CSCs) is being established, which will link more than 600,000 villages across the country. The CSCs have been conceived as the front-end delivery points for public, private and social sector services. A highlight of the CSCs is that they can offer web-enabled public services such as application form download, certificates, payments of electricity, telephone, water and other utility bills in rural areas.

A lot of ICT experiments and initiatives are happening in India. A discussion about all these initiatives is neither desired nor relevant for the main topic of this paper. Only select initiatives are discussed here to provide an overview of the various kinds of ICT media employed as well as its applications in various sectors, with special focus on its extent of reaching/benefiting rural women. These are classified based on the nature of technologies/applications being used.

3.2.1 Internet-enabled computer centres (kiosks/ knowledge centres/ service centres/ telecentres)

Warna Wired Village project initiated in 1988 to provide connectivity to 70 villages in the sugarcane belt of Kolhapur and Sangli districts of Maharashtra perhaps could be the first ICT initiative in India that used an internet enabled PC, to support farmers with information on crops, prices and government schemes in local language. However the most discussed and documented initiative of this nature has been the knowledge centre initiative of M S Swaminathan Research Foundation (MSSRF), which started in 1998 at Pondicherry as part of its Information Village Research Project. Over the past decade or so, this initiative has

extended beyond Pondicherry and Tamil Nadu to other states such as Orissa and Maharashtra. Box 6 has more details of this initiative.

Box 6: Village Knowledge Centres of MSSRF

Each village knowledge centre (VKC) has one or more computers with CD-ROM drives, printers and scanners. These are networked to a hub centre (Village Resource Centre). The hub provides links to external information sources and they manage the database of the local intranet. In response to villager's specific requests for information, the hub staff will find the appropriate information and if needed, translate it and reformat it to make it accessible to the villagers. Where connectivity is suitable, video-conferencing links have been set up so that villagers can ask questions directly and verbally to the experts back in MSSRF. Each VKC is managed by one or two knowledge workers, who are village volunteers, mostly women, trained by MSSRF in operating the computer and the Internet. The VKCs also use other media, notice boards, public address systems, community newspapers, cable TV, telephone meetings, mobile phone and the Internet website for dissemination of locally relevant information in local language.

The two core components of the VKC model are locally relevant content and appropriate network connectivity (Swindel, 2006). About 25-30 people visit VKCs on an average. Information provided in the VKCs is locale specific. For instance at Pondicherry, information provided include prices of agricultural inputs (such as seeds, fertilisers, pesticides), outputs (rice, vegetables, sugarcane), market entitlement (the multitude of schemes of the government), health care (availability of doctors and paramedics in nearby hospitals, women's diseases), cattle diseases, transport (road conditions, cancellation of bus trips) and weather (appropriate time for sowing, areas of abundant fish catch, wave heights in the sea). Most of the information is collected and fed into the system by volunteers from the local community itself.

In August 2003, a National Virtual Academy for Food Security and Rural Prosperity was established with the support from the Tata Social Welfare Trust. As on September 2009, 18 VRCs and 101 VKCs have been set up by the MSSRF in India. The MSSRF has brought out a toolkit for setting up Rural Knowledge Centres based on its learning from setting up such initiatives in India (MSSRF, 2005). Gender concerns and social inclusion are core principles underlying this project. Financial sustainability is not the underlying or over-riding principle of the knowledge centre initiatives. MSSRF clearly believes that knowledge centre exists to serve citizens and a price cannot be put on accessing knowledge (Vaidyanathan, 2008).

Later several such initiatives (in the genre of info kiosks) sprung up in different parts of the country. Not all of them followed the same model. Some were government supported, and others adopted a business model (users pay) right from the beginning. n-Lounge, an IT company has a franchise model, where it provides an info kiosk (PC with internet and video conferencing facility, scanner and photocopier, etc) at a low cost and train the kiosk owner, and the owner provides different services and tries to earn a reasonable income. Drishtee is

another such private initiatives that operate on franchise and partnership model. These kiosks are operated by small rural entrepreneurs.

Change initiative, an NGO, experimented with fixed and mobile telecentres at Nadia in West Bengal. During the project period, it reached a large number of villagers including rural women and youth with relevant agricultural information. The mobile telecentre (telecenter operator and a laptop having searchable database of agricultural information) used to reach the project villages twice a week on alternate days. Though the mobile telecentre demanded excess human resources, it helped in reaching out to more people in the area, especially to conservative muslim women (Goswami, et al, 2010). But with the end of project funding, this activity failed to sustain.

Another major internet-enabled computer initiative is the “e-Choupal” of ITC which was initiated in June 2000. The PC and the Internet access provided by ITC at the sanchalak’s (a trained farmer working for ITC and facilitating procurement for ITC) location enable farmer to obtain information on *mandi* prices and information on good agricultural practices. The farmers do not pay anything for the services and there is also no government investment in e-Choupal. For ITC, its investment in e-Choupal is part of its business investment where it benefits from the lower net cost of procurement (despite offering better prices to the farmer) having eliminated costs in the supply chain that do not add value.

The Akshaya project being implemented by the Government of Kerala in a public-private partnership mode is also of the information kiosk type. The entrepreneur makes the investment for setting up the centre (five to ten computers, printer, scanner, webcam, and necessary software) and the Government (State IT Mission) provides all the facilitation required to sustain the project (e-literacy programme, training fund, e-governance services etc). Akshaya has been a much celebrated ICT initiative and it began with an e-literacy campaign. “More than half a million people have been provided with basic computer skills and around 65% of the beneficiaries under this programme are women” (Gurumurthy et al, 2005). However, the Akshaya kiosks are finding it difficult to be both financially and socially sustainable (Kuriyan *et al* 2006) and nearly 40% of these centres that began in May 2003 have closed down weighed down by debt and financial loss (Naha, 2005). The e-Krishi programme, initiated by the Kerala State IT mission to facilitate and enable farmers to sell the produce using ICT network of Akshaya has not been faring as expected. Lack of engagement

of the state DoA by the IT mission has also contributed to the poor performance of the *e-krisshi* programme.

I-Kisan, is an ICT initiative of the Nagarjuna group of companies. In addition to the I-Kisan portal which it started in 2000, it has set up information kiosks. It was involved in Mini Mission III under the Cotton Technology Mission for software development, hardware supply, systems integration and operation and maintenance of Farmer Information Centres (FICs) at various market yards in India. I-Kisan is a partner in the NAIP Project on sustainable rural livelihoods led by CRIDA and the project is currently establishing eight Knowledge Share Centres (KSC), similar to information kiosks. Each KSC has an internet-enabled PCs, touch screen kiosks, Interactive Voice Responsive System (IVRS), and a display announcement package. The kiosk allows users to navigate for information on crop cultivation practices, crop diagnostic kit and market information.

Under the virtual academy for semi-arid tropics (VASAT), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has established one knowledge hub at Adakkal mandal, Mahboobnagar District, Andhra Pradesh in 2001 in association with *Adarsha Mahila Samikhya* (AMS), a federation of all-women micro credit groups representing 8160 women covering 37 villages in the locality. The AMS hosts the hub infrastructure with PCs and the Internet connection. In December 2005, Indian Space Research Organization (ISRO) provided the facility for a satellite based video conferencing facility and this is used for video-conferencing to connect to ICRISAT experts to seek advice on crop production, disease and pest management, measures to cope with drought etc. This hub is connected to eight rural access points (village information centres) located in the neighbouring villages. Every season ICRISAT takes up studies on climatic conditions and its changes and prepare weather maps/drought maps. These maps can help communities in knowing the drought condition and thus can reduce the impact of drought by choosing alternative cropping patterns or by taking up other employment opportunities. The videoconferencing facility is used to follow-up on recommendations and to foster drought preparedness by giving advisory on cropping, water and soil management (Sreedhar et al, 2009).

The CSCs of the Government currently being rolled out all over the country is envisaged as the front-end delivery points for the Government. The PPP model of the CSC scheme

envisage a 3-tier structure consisting of the CSC operator (called Village Level Entrepreneur or VLE); the Service Centre Agency (SCA) that will be responsible for a division of 500-1000 CSCs; and a state designated agency (SDA) identified by the state government responsible for managing the implementation over the entire state. As of December 2010, 87,594 CSCs have been rolled out. The CSCs will offer web enabled e-governance services in rural area, including application forms, certificates and utility payments such as electricity, telephone and water bills. These centres have to generate revenues to sustain these and they are now offering a large number of services such as train bookings, insurance, photography, courier service, e-learning etc to raise enough revenues. As of today there is no mechanism or vision to use CSCs as knowledge centres.

3.2.2 Portals

There are a large number of portals providing information related to agriculture and other rural development initiatives. Under NICNET Based Agricultural Informatics & Communication (AGRISNET), implemented by Department of Agriculture & Cooperation (DAC), MoA, each State Government has established websites that provide information on crop management, crop protection, soil and market prices etc. Under another initiative, DACNET, an e-governance project of DAC, MoA, is networking different directorates and field units of the DAC and is providing a wide range of agricultural related information on-line. India Development Gateway (InDG) is another initiative of the Government of India implemented by C-DAC (Centre for Development of Advanced Computing) to provide a wide range of agricultural information in local language. I-kisan, the agricultural information portal initiated by Nagarjuna Group also provides information on a wide range of crops.

The Agriwatch portal is the largest agri-business portal in India and it provides a large amount of agri-business related information on agriculture and food industry. The Agricultural Marketing Research & Information Network (AGMARKNET) links together all the important agricultural produce markets in the country and provides information on arrivals and prices of produce traded in more than 2800 wholesale markets all over India. Karshaka Information Systems Services and Networking (KISSAN) is another innovative IT facilitated project in Kerala. The project has been conceived, developed and implemented by IIITM-K. It provides information on 55 major crops in Kerala, daily agricultural information market information from major markets and also has an on-line query management system.

The Directorate of Rice Research (DRR) is currently developing a Rice Knowledge Management Portal (with NAIP funding) that would enable rice workers to create, manage and share scientific, technical and market related information. Most of the technical institutions (research organizations, agricultural universities, commodity boards, DoAs etc) have websites that provide a wide range of information on commodities/crops each one is dealing with. A recent evaluation of websites for contents on coconut farming revealed some of the limitations of websites on agriculture. “Easiness in accessing the information varies widely across sites and most of the sites under analysis did not have adequate visuals. In most case, the information provided is very generic with no specific recommendations to different agri-climatic zones or districts within the state” (Muralidharan, et al, 2006).

There is an on-going initiative called “*agropedia*” that aspires to manage and organize the widespread knowledge in the Indian agricultural domain through building up an agricultural e-community and strengthening the networks among the different members of the community. It is a platform where both specialists in the agricultural research and education domain and any other interested in agriculture can make lasting contributions to vast knowledge base. This initiative under NAIP is led by the IIT, Kanpur in consultation with a consortium of partners. Today it has over 1800 registered users with over a thousand documents (Sarkar et al, 2010). Another interesting initiative is aAQUA (almost all Questions Answered), which is a multi-lingual online question and answer forum- which provides online answers to questions asked by farmers and agri-professionals over the internet.

3.2.3 Call Centres

The MoA initiated the “Kisan Call Centre” (KCC) scheme in January 2004 to provide information to farmers seeking information on telephone, by the local agricultural specialists in their local language. Farmers could call the nation-wide toll free number of 1800-180-1551 and the calls are picked up in 25 KCCs located across the country by agricultural graduates at Level-I, with provision of escalation to Level II and Level III. Until July 2010, 49.32 lakh calls have been received from the farmers in the KCCs. And when the agents are not able to handle the query, the calls are diverted to Level Two, comprising experts identified by the Department (Chandragowda, 2010).

In Tamil Nadu, the Director of Extension Education, Tamil Nadu Agricultural University (TNAU) is the nodal officer for Tamil Nadu and Pondicherry (Box 7). The level I is managed by a private company “Caretel”, which has employed agricultural graduates to manage the operations. In level 2, the Subject Matter Specialists panel constitutes an officer of the DoA, an officer of Department of Horticulture, an expert from the Veterinary University and a scientist from the Banana Research Station, Trichy and TNAU Staff. They will be in their respective centres. The call centre staff tries to connect the caller with the expert in the teleconferencing mode. At level III, the experts are the Dean, Agricultural Engineering, Director of Centre for Plant Protection Studies and Director of Research.

Box 7: Kisan Call Centres in Tamil Nadu

At level I, the person attending the call asks for the name, name of the village and other personal details and uploads these in the data base and the caller will be assigned an ID number. Then the queries are answered. Level I team provides information about the crop protection practices, about the schemes and subsidies and if it can't be satisfactorily answered it will be passed on to the next level.

Almost all queries are answered at level I only. The level I staff are trained by the TNAU experts periodically. Daily 200-250 calls are attended. The same farmer can call repeatedly with the same ID number. Six trainings are organised every year for the level I staff. Discussions at level I indicated that they receive lots of queries from Salem, Erode, Coimbatore and Thiruvannamalai districts, in comparison with other districts.

The KCC in Tamil Nadu faces two challenges, Firstly, the staff at level I don't have adequate experience; most of them are fresh graduates. They answer most of the questions, not because they can confidently answer all, but due to difficulties in contacting concerned staff at level II. Secondly, the experts at Level II are working in their respective stations and they have several other responsibilities and they are not often available to answer the queries.

In addition to KCCs, some of the state governments have established their own call centres for farmers. For instance, Andhra Pradesh Government has established a call centre called *Parishkaram* under the control of Commissioner, EDS, IT & C (Electronically Deliverable Services, Information Technology and Communications) with the main objective of addressing the grievances of the citizens in the state 24X7 by calling the toll free number 1100 or 1800-425-1110.

The services rendered to the citizens are agriculture, GHMC, education, elections, emergency service, health, power, labour employment, municipality, revenue, treasury, welfare schemes and other government schemes. The department functionaries/district collectors/heads of departments can log into the application from any location in AP and update their responses

to the citizen's queries and complaints. Farmers could use the same facility from 10.00 AM to 5.00 PM to find answers to their agricultural queries/problems by directly interacting with the agricultural scientists of Acharya NG Ranga Agricultural University (ANGRAU) located at the call centre in Hyderabad exclusively for this purpose (Box 8).

Box 8: Farmer Call Centre, Government of Andhra Pradesh

The Farmers Call Centre (FCC) was inaugurated in Andhra Pradesh on July 1st, 2003. It is accessible to the farmers of AP on toll free numbers 1100 or 1800 425 1110. Since its inception, 125,000 farmers from different districts of Andhra Pradesh utilized the services of FCC and benefited by taking advice from scientists of ANGRAU. Unlike KCC, there are no different levels in the farmer's call centre. As soon as the calls are received, the operator attends the call, categorises the problem and transfers the call to the scientists. The centre on an average receives 20,000 calls an year. In the peak season the average calls /day is 300 and in off season it is in the range of 100-150. In a week the average calls come around 400-500 and in a month 1600-2000.

The ANGRAU scientists posted at the FCC are from the fields of entomology, agronomy, plant physiology, plant pathology and soil science. The call centre also has two officers from the DoA to appraise about the Department's schemes and subsidies. In addition to advice on regular package of practices for different crops, the farmers are advised on weather forecast, market rates of crop produce in different yards (from authorized websites), input supply, rates, cost of various tools and implements and their availability, Government support for Horticultural crops (subsidies on drip irrigation, subsidy on fruit plants supply, poly houses) and address and phone numbers of various Government offices related to agriculture.

Apart from these services, scientists are disseminating answers to select questions through mass media such as Television, radio, newspapers and monthly magazines so as to reach to the maximum number of farmers. Frequently asked questions of the farmers at the FCC and the respective suggestions given by the scientists are being scrolled in Saptagiri channel in "Rythunesam" programme which is telecasted on Monday, Tuesday and Thursday from 6.35 to 6.55 PM. The same is broadcasted through AIR Vijayawada, Vishakapatnam, Hyderabad and Kadapa stations. Some important location specific questions and their answers are published in the Sakshi Newspaper in the Agriculture column "Padi pantalu" on Friday. Some important queries received from the farmers and the suggestions given to them are published regularly in the monthly Telugu Agricultural magazines like Vyavasayam, Padipantalu and Rythunesam.

"On an average, in the KCC's across the country, only about 10-15% of the calls are from women. About 50% of the callers are women from the north-eastern states and Uttarakhand. Only about 5 % of the calls are from women in states such as Punjab, Haryana and Uttar Pradesh" (personal communication, Dr. V.P. Sharma, MANAGE). Though data on women's use of KCCs are available, the research team couldn't access this information. The staff at the Farmer Call Centre (Government of Andhra Pradesh) reported that only about 5% of the callers are women. During the three month period June to August 2010, out of the 4563 calls resisted at the FCC, only 18 callers were women.

Call centres are also now being used to provide health information. “104 Advice” is a health helpline providing quality medical information, advice and counselling round-the-clock to the 80 million people of Andhra Pradesh in English, Telugu and Hindi. Anyone in the state who has access to a telephone can dial 104 for medical advice and information. 104 Advice has on board, specially trained counsellors, doctors, paramedics and PhDs to effectively guide the system. The helpline provide counselling services on HIV/AIDS condition, matrimonial discord, depression and chronic diseases, psychological distress, early identification of suicidal tendencies and suicide prevention and directory information on health service providers, diagnostic services, hospitals, and government health programmes. Started in 2007 with 4 seats and attending 200 calls per day, the 104 facility has now expanded to 450 seats working round the clock to attend an average of 50,000 calls per day (HMRI, 2011). On an average 15% of the callers are currently women.

To provide support to women who are facing domestic violence, call centres are being currently established at different locations in India. Bhumika is one such helpline for women in distress. This help line was started in Andhra Pradesh in 2006 with the support of OXFAM GB. Till now as on May 2010, helpline received around 4000 calls. At present help lines daily receive 30-40 calls to assist women seeking help from the violent relationships that they are caught in. The objectives of the help line are providing/giving space to women in distress by listening to them; providing link with formal justice system; and providing referral services to women. Bhumika helpline is a toll free (free of cost) telephonic helpline. Counsellors provide support and counsel through phone. Depending on the need of the caller, counsellors give suggestions or refer them to various services (medical, psychiatric, legal, short stay and others). Sometimes helpline counsellors directly involve in some cases depending on the nature of the cases.

3.2.4 Mobile

The International Telecommunication Union (ITU) estimates that there are 4.6 billion mobile subscribers and forecasts that by end of 2010, there will be 5 billion mobile subscribers, making mobile phones the most rapidly adopted technology in history and the only sector that hasn't suffered from recent economic downturn (Samii, 2010). Several studies have indicated the importance of mobile phones in providing information related to market prices, input availability and weather to rural producers.

As per the TRAI statistics ending September 2010, the mobile subscriber base in India stood at 687.71 million. The rural mobile subscriber base is 227.08 million (33.02 % of the total mobile subscribers). With mobile phones becoming cheaper, easier to procure and the network charges becoming more affordable, an increasing number of rural audience adopted the technology (Sharma, 2009). This has provided greater opportunities for using mobiles for addressing some of the information needs of farmers.

The recent study of the Indian Council for Research on International Economic Relations (ICRIER) on socio-economic impact of mobile phones on Indian agriculture concluded that the mobile phones are contributing to agricultural productivity enhancements. The benefits emerge mainly from the characteristics of mobility, customized content delivery and convenience (Mittal et al, 2010). In the case of fishermen, in addition to economic benefits, there were other benefits like safety and enhanced quality of life from decreased isolation and vulnerability. In India, IFFCO Kisan Sanchar Limited (IKSL), Reuters Market Light (RML) and Tata m-Krishi are the three successful examples of mobile information service for the farmers.

IKSL is a joint venture between Bharti Airtel and the Indian Farmers Fertiliser Cooperative (IFFCO). Farmers who purchase a Bharti Airtel “Green SIM” have access to value added services which include daily agri-voice messages (weather, crop/animal husbandry advice, market prices, government schemes etc) and an agri-helpline (costs Rs. 1 per minute). Through mKrishi offered by the Tata Consultancy Services, farmers get answers to queries related to agriculture, such as advice on use of fertilizers, pesticides and growth hormones. It also provides up-to-date weather and market information through text messages on cell phones.

Subscription of the RML cards makes the customer eligible to receive information on two crops, three markets or one crop and six markets. Information related to crops advisory is made available from sowing to harvesting periods. Information on weather is supplied via SMS, every morning for the entire year. Farmers can subscribe to this services by buying vouchers (3 monthly, 6 monthly or annual subscriptions) and the service costs approximately Rs.2 per day. RML employs market reporters to collect the information from each of the

markets covered. Since its launch in 2007, over 200,000 farmers in 15,000 villages across 10 states in India have subscribed to RML (Pawar, 2009).

Krishi Vigyan Kendra, Babhaleshwar in Ahmednagar District of Maharashtra is also using mobile phones for disseminating agricultural information. There are currently 284 registered farmers availing this services on paid basis (Rs.100/- per annum) from this KVK. KVK scientists source market prices and weather information from the internet, interpret and broadcast them as SMS. The messages cover weather, market prices, plant protection measures, agricultural practices, subsidies and government schemes. (Bhaskar, 2009).

Increasingly farmers use mobile to understand the prices prevailing in the markets. They do this either by calling their commission agent or their known market intermediaries or by subscribing to services that provide market information. Some also use facilities such as e-choupal to understand the current prices. In the case of perishable commodities such as fruits and vegetables, there are only very few initiatives. DMI project implemented by TNAU is one such initiative (Box 9).

Qualcomm India, TATA Indicom, Astute and MSSRF have started a joint initiative called “Fisher Friend”, a mobile application which provides vital real-time information to fishing communities when and where they need it the most, at mid-sea. This includes when and where to sell the fish through access to market prices, weather (e.g., sea wave heights, satellite scan data about fish shoals), government schemes, etc.(Sharma, 2009; Saravanan, 2010). A study on use of mobiles in the fisheries sector reports that the introduction of mobile phones decreased price dispersion and wastage by spreading information which made the markets more efficient. Mobiles allow fishermen, to get timely price information and decide the best place to land and sell their daily catch (Jensen, 2007).

Box 9 : Market information for fruits and vegetables

Dynamic Market Information through mobiles (DMI) is a project implemented by InDG and C-DAC, Hyderabad in association with the TNAU, Coimbatore. The service provides wholesale and retail prices for nearly 130 crops – mainly vegetables, fruits, flowers, spices and plantation crops on a daily basis. DMI provides market price information for the selected commodities via Short Message Service (SMS) through mobile phones on a daily basis to almost ten thousand subscribers in Tamil Nadu for the past two years. The markets covered under this project are Cochin, Coimbatore (MGR market), Ottanchatram, Chennai (Koyambedu), Trichy (Gandhi Market), Bangalore (K.R. Market), Hosur (Vegetable Vendors Association Market), Kumbakonam, Madurai, Mettupalayam, Panruti, Thalaivasal and Tirunelveli.

Representatives posted at different markets collect market prices and reports it daily at dawn when arrivals begin and pass them on to TNAU from where, after appropriate formatting, data are uploaded on to a website. By noon every day, prices are available online, both in Tamil and English and the same information will be transmitted through mobile phones. Only the farmers who have registered with DMI to receive market information are provided with the SMS service. The DMI message is composed of market price for one commodity in two markets as preferred by the receiving farmer.

The DMI application was developed in such a manner that this application will be used in future also for adding more markets and more commodities. The data base structure provides flexibility to scale up with minimal effort. Right now farmers are receiving the SMS free of cost. It has been decided to introduce minimal charges like seasonal packages to farmers to meet the recurring costs. Advertisement spaces are introduced in the DMI page for trader associations and agri-input dealers. This model can very well replicate in other states also where there is no support for perishable markets. Already C-DAC, Hyderabad is in negotiation with other State Governments and agricultural universities to replicate this initiative.

Women often find it difficult to attend formal trainings organized at training centres for several reasons. These include, lack of other responsible adults with whom they can leave the small kids, loss of daily wage, no one else to care for cattle at home, etc. For such women, mobile phones could be effectively used as a communication and conferencing system for organizing training programmes within their homes or near to their home, where they get together for self-help groups (SHG) meetings. The project on developing “training tools for use among the women self help groups” led by the Rajiv Gandhi College of Veterinary and Animal Sciences, Puducherry has identified such an application, which has been tested for its effectiveness (Box 10).

Box 10: Cell phone operated mobile audio communication and conferencing system (COMBACCS)

This method is similar to use of mobile phone dialogue between two individuals, in which on one side a larger number of audience/group can hear through a loudspeaker. It needs a mobile connection and an active SIM card between the expert resource persons and the group. The system at the group's end has mobile phone connected to a loud speaker. The phone will be dialled to the destination number. The response and the reply will be heard by the group members through the loud speaker in the COMBACCS. The group members can speak through the cordless mike which will be transmitted using mobile phone to the expert connected at the other end. The reply will be amplified and heard through the speaker boxes.

This is found to be ideal for training whenever the resource person is far off from the groups. It could also be used during group meeting. This application was designed by the Kerala Agricultural University and was tested at Puducherry with a large number of women groups involved in dairying. Some of the important advantages mentioned were as follows:

- Scope for better interaction and clarification of personal doubts from home/neighbourhood,
- Saving money and time both for group members and resource persons,
- More people trained in less time and promoters can directly interact with group members.

COMBACS was found to be helpful in reaching members of women self help groups in rural remote areas and address constraints of formal training. A COMBACS unit costs Rs. 4000/- This facility has high potential for wider use not only for agriculture, livestock and rural development, but also in the area of community medicine.

Source: Ramkumar, (2009); Elizabeth (2010)

Our interactions with many of these agencies indicated that these services are mostly subscribed by men and in many cases, there is no specific information on the number of women who have subscribed to these services. One possibility is that the ownership of mobiles is mostly with men in India. Sharma (2009) reports that mobile phone ownership in India is largely limited to the earning male or head of the household, the reason being their inability to produce the proof of identity required to get a connection.

Findings from another study on fish sellers in Mumbai, confirms this trend. “39 percent of the fish selling women from the Koli community lived in households with mobile phones but only 15 percent of these had their own mobiles. Mobiles controlled by other family members, especially husbands, were inaccessible to the women. Most of them, therefore, reported using public call shops (62 percent) and only 7 percent said that they could use a mobile owned by another member of the family” [Babar *et al*, 2008].

3.2.5 Community Radio

Community-based media, as per definition, is media, of, for and by the community. Its lack of reach is compensated by its depth, interaction and participative character. A community radio (CR) station can be roughly defined as a short range radio station that caters to the information needs of communities living in surrounding areas. CR stations often involve local community members in program production, centred around topics including discussions on civic amenities in the area, health and hygiene, advice on common economic activities such as agriculture, and even local folk songs and cultural events. Though the importance of community radio has been well known in India (thanks to few well known experiments by NGOs), until 2006, only educational institutions were allowed to set up community radio stations. The scope was expanded in late 2006 to also include non-profit agencies, agricultural research institutes, and schools, to set up community radio stations that would involve local communities in the content production process.

Organisations such as Voices, Drishti Media, Himalaya Trust, Deccan Development Society (DDS), Myrada, and *Kutch Mahila Vikas Sangathan* have been involved with experiments on using radio for production and broadcasting of locally relevant information even before, but they have been using narrowcasting (audio programmes played over loud speakers at community meeting points or within listener groups of women) and cable casting (through cable TV run by local operators). In Uttarakhand, a number of CR initiatives started in 2001 after Himalaya Trust organized training and these include: Henvalvani CR (Box 11) Mandakini ki Awaz (Box 12), Pradeep Samudayik radio Kasauni, Shristi Samudayik Radio, Bageshwar, Bal Ganga CR, Tehri Garhwal in Uttarakhand.

Box 11: Henvalvani Community Radio, Chamba, Uttarakhand

Henvalvani CR started in Chamba, Tehri Garhwal in 2001 when a group of about 24 people from the villages in and around Chamba town came together and began the initiative with the assistance of Himalaya Trust, Dehradun. Currently 9 of these 24 members are actively involved in the functioning of CR. The Henvalvani CR is currently awaiting clearance from the Government for obtaining a license to broadcast on the 90.4 MHz frequency of FM radio.

As of now they are not broadcasting (this can take place only when they get the license), but have to make do with narrowcasting through audio cassettes and audio CDs and play it at a community meeting place (GP meetings, meetings of *mahilla mandal*, etc) for their listener groups. Earlier they were airing programmes on the world space of the Asia Development Channel, a satellite radio channel. Receivers had been set up by the satellite radio in the villages in the vicinity of the listener groups.

Equipments for narrowcasting are particularly low cost involving a PC, Microphone and a mixer. They have made low cost studio using local resources. Some of the cost of equipment was supported by UNESCO and the CR received some funds from other sources. However, they have been meeting the operational costs by making advertisements for commercial purpose for Airtel, etc. If outsiders demand the cassettes or CDs made by the CR then they are charged at a nominal fee of Rs 100/- each. So far, listener groups have been contributing funds for the running of the narrowcasting. The members of the CR also go and impart training to other organizations on the basics of setting up of community radio. They would require 6-7 lakh in setting up the CR once the license is obtained. They are expecting donor funds to set the radio station.

Every month for each listener group, they have two narrowcasting. The programs that are aired are:

- Hamara Gaon' – related to issues on environment, dowry, women rights, other relevant issues of the village and community,
- 'Baal Jagat' – on child care, talent hunt for the children
- 'Yuva munch' – youth talents are invited
- Swastha charcha' – related to health, reproductive health, etc
- 'Geet Ganga' – commercial movie songs, entertainment
- 'Chuhi baat' (wise conversation) – interviews with social workers, eminent people of the community/region, doctors, political figures, administrators, etc

The programs are similar to the magazine format. These follow an anecdotal style of presentation and use folklore and jokes to make these topics more interesting to the listeners. The feedback from the listeners is taken at the end of each narrowcast & is aired in the next narrowcast as listener interviews.

The listeners are mostly women (about 75%). There is a high rate of migration of men from this area. The listener groups comprise mainly small farmers (some have orchards as well). On the basis of community suggestions, they prepared programmes on locally relevant issues such as forest fires, electricity, water woes, monkey menace, problems created by pigs in the farms, etc. Sometimes they get the local specialists to discuss on these problems and they visit the specialists to interview them. They also interview some of the block level functionaries if some of the schemes are not working well. Since the people running the CR are from the community itself so they are more aware of the needs of the community and respond accordingly.

At present there are 20 village facilitators to cater to 20 listeners groups. These village facilitators are chosen by the villagers. The CR team received initial training on editing, narrations and script writing trainings. They received initial help from Himalaya Trust and later on received technical support from Idiosync media combine, Faridabad. Once they receive the license and they are aiming for a 100 watt transmitter that would enable them to cater to the 400 villages in a 10 – 15 km range (in a mountainous region). At present reaching 400 villages seems a mammoth task.

Bhanaj is a Himalayan village at about two hours drive from the main highway connecting Rudraprayag to Kedarnath. It is in an extremely remote spot. At the time, when Mandakini Ki Awaz CR (Box 12) started in Bhanaj and nearby villages, they had no other available sources of information especially for the poor communities. Newspaper was accessible to only the rich and literate in the area. For the poor, the information available in the newspapers never made much sense. There were no telephone sets/mobile cell phones either. Hence sharing information on earthquakes/landslides etc was not possible within the community, especially since the hilly settlements have a pattern of having houses far flung from each other and unreachable mostly by roads. Radio has always been a part of life for hilly people but it has never been this close to their lives and their hearts.

Box 12: Mandakini Ki Awaaz, Bhanaj, Rudraprayag, Uttarakhand

This CR initiative started in 2001 after receiving the training conducted by the Himalaya Trust. They have listener clubs in 15 –16 villages with each village having a village facilitator. The families mostly have 2 – 3 months of agricultural work. Every 3rd or 4th member of the family has government jobs, and women are involved in making Rhododendron juice (buransh sharbat), Malta juice, pickle making, bee keeping, etc. The villages around Bhanaj produce potato, paddy, malta, Pahari (hill) Lemon (Galgul). Literacy rate is 64% & 71% for women & men respectively. Currently they are into narrowcasting and have been trying to air their programs through cable casting as well for the past year and a half. Till December 2009, they were airing their programs through the satellite radio program.

Initial set up costs were met by the program and furniture was provided by the community. Initially they had an analogue recorder and a double cassette player which were used for editing and mixing. In 2004, *Gram Panchayat*, Mahila Mandal, Youth Clubs supported them to set up a center. During 2005-06, Idiosync media combine, Faridabad provided them with digital recorder, computer, training, and

this allowed them to broadcast programs with improved quality. They have currently applied for a license for the FM frequency. *Van panchayat* and *gram panchayat* have already made provisions for land for setting up the radio station once the license is obtained

They have 15 village reporters, 5 – 6 community reporters, and 4 people handling the CR. Most of their workforce is doing voluntary work. They have monthly discussions with the entire team. Currently they have 250 – 300 members and once they obtain the FM frequency license they aim to have a membership of 180,000 people in the vicinity of 180 villages within 12 – 15 km. Once they have a wider audience they would have more demand for the programmes.

They have programs on issues pertaining to:

- Children and health
- Svachcha paani' (Clean Water),
- Paramparik Vaid' (Traditional Healers),
- Gharelu Nuske' (Home Remedies);
- Migration – information on safe migration;
- Women issues; and
- Natural disasters

The content is mostly in Garhwali and sometimes in Hindi as well. Some programmes have mixed Garhwali and Hindi dialect

They have been raising operational cost by the following ways: charging a nominal membership fee of Rs.100/- per annum from their members whether they are individuals/groups, providing sound system and amplifier for local marriages, making audio programme for a fees for the Government Watershed Programs, preparing programme on migration and HIV aids for Idiosync media combine, Faridabad, preparing street plays (audio versions) for local *natak mandli*, by providing training programmes to children on RTI, and providing training on media tools to other organisations

At the community meetings, some of these programs are narrowcasted by the village reporters. At these meetings it is decided what the content for the next programme should be after obtaining feedback on the current programme. If there are some newer issues then the content is generated by interviewing the relevant person(s). If need be, even telephone interviews are carried on with experts. For example they have been using telephones to obtain information from the *taluka* and district offices at Agastamuni and Rudraprayag respectively. Wherever there are active officers in the departments, they respond well to such initiatives. The CR also narrowcasted a programme on value addition on Malta after a need was felt for the same. For this they obtained the information from the juice centres in the town.

CR also provides other locally relevant information such as change in schedule of bus from and to nearby towns due to breakdown or landslide, information on ration cards, payment of electricity bills. etc. They also provide the radio programmes in memory cards (USB) to the Taxis plying between Chandrapuri to Bhanaj (about 35 – 40 km).

Interactions with rural women communities in Bhanaj revealed that information related to forests/forest fires, school, water purity/cleanliness, child care, dowry, superstition, medical remedies, etc was received very positively by them. Moreover, they appreciate the importance of such radio programmes as they can keep on doing their household chores and still listen to the programmes and gain useful information without having to interact with

anyone. Such information was lacking in their lives prior to the advent of CR and they were shy to seek the information even if they required it.

Women who go to the forests share the information with each other related to forests even if they are not part of the listener groups. They found information on migration also pretty useful. These are the issues that are closer to their lives. Some of the women felt that after giving several interviews on the radio, their confidence has also been boosted as they had never been given any opportunities to make their opinions been known in public places. They were initially scared to even utter a single word in front of a mike. Some of them pester the CR community reporters for taking more and more interviews.

The user groups are mostly literate. Some of the younger women feel that once they get married they would wish to disseminate information about CR in the new village and extend CR initiative there, add listener group there as well if possible. There was no other medium available in the village earlier. Women had to depend on hearsay prior to CR. Once the radio station is set up and it functions well, local youth can get employment, and the community can benefit by only having locally relevant information but also a more promising medium for taking forward their local cultural folk songs, stories, history etc.

Kongu Community Radio was started in the year 2004, by the Kongu Engineering College, Erode, Tamil Nadu. Broadcasting from this CR started in 2005 and it currently reaches 33 Panchayats around Perundurai (radius of 15 km) where the college is located. Kongu CR has a mobile recording theatre which it takes to villages to record some of the programmes. It also brings village listeners to the studio to record programmes and also to showcase its facilities. The staff and students of the Kongu Engineering College (Women Development Cell, Industry Institute Partnership Cell, Humour Club, Creativity and Fine Arts Club and other associations) women SHG members, and experts from outside have been providing the content (Box 13).

Kongu CR broadcasts programmes from 7.30 AM to 10.00AM and from 12 PM to 7.30 PM on all days in a week and on Sunday from 12 PM to 7.30 PM. The college invested about Rs.25 lakhs in setting up the studio. The operational/maintenance cost comes around 6 lakhs and this includes salary of two technical assistants and one programmer. Kongu FM generates some limited resources through advertisement. As per the guidelines of Ministry of

Information and Broadcasting, five minutes of advertisement is permitted for every one hour of broadcast and each one minute of advertisement could be sold for Rs. 60/- minute and this revenue has to be ploughed back into the CR. The Kongu FM radio has won the best community award, Radio Duniya 2008 Award, competing against 27 community radios

In 2007, the Department of Science and Technology (DST), Government of India, sanctioned a project Science for Women to the Kongu Engineering College, to organize a special programme for rural women through CR. This programme was named as “*Kongamma Kelamma*”. At the start of this programme a baseline survey was conducted, in the villages around Perundurai where the signal of Kongu FM was clearly audible. The findings were as follows:

- At present the community participation in Kongu FM programmes is very limited, but 41% wanted to participate in radio programmes.
- The community felt more participatory programmes, especially interactive programme with experts will be useful
- 30% of the respondents expressed their desire to participate in radio programmes
- Highest interest was on programmes on agriculture (24%) and on traditional vocational training like tailoring, handicrafts, food processing etc.

This survey concluded that a programme such as Science for Women should develop programmes in a participatory production mode. The study also highlighted the need for devising ways of recording the women in their homes frequently as women seem to be partners in earning and may not find time to come for recording at the studio.

Box 13: Interactions with the Community /Listeners/Volunteers of Kongu FM radio at Perundurai

Agriculture and Livestock rearing are the major occupation of people living in Perundurai village in the catchment area of Kongu FM radio. In 2007, Kongu Community approached the women in this village expressing their desire to involve their SHG and their community to participate in their new radio programme Science for Women. A 3 day awareness programme was organized about two years back. In the awareness workshop, they were briefed about this project and were also invited to provide inputs, ideas and voice to the programme. They were also trained in producing programmes and were also taken to the radio station to interact with the programme team and students. This led to the development of the programme “*Kongamma Kelamma*” and it means Kongu Women Listen.

In their village and surrounding places the awareness on health conditions of women and children and pregnancy care was very low. Many women are so hesitant to go to the health centres for checkups and treatments. So they have decided to build awareness on health issues through *Kongamma Kelamma*. In addition to this, they organized health camps and through this event, they realized that about 50% of the women are anaemic. This led to development of a programme on causes, prevention

and cure of anaemia. They also organized a dental camp for school children and it received good response from the parents, teachers and students.

There were lot of snakes in their agricultural land and so they made a programme to make the people aware of the snake bites and its first aid. Also the villagers had a problem of getting regular drinking water from the common taps while the ground water was hard and salty. It was difficult for the villagers especially the women to tackle the water problem so they hosted a live in phone programme in which the panchayat leaders were invited and a solution was sought, which is going to be implemented shortly.

Agricultural schemes and the input availability are known through the agricultural officers and they air the programme. Practising organic farmers of the neighbouring district were interviewed and the programme was broadcasted. Farmers practicing vermicompost were interviewed once. Similarly IPM (Integrated Pest Management) package for coconut weevil, mealy bug in cassava, rat control and drip irrigation for sugarcane, coconut and groundnut was also aired.

The listener's groups belong to young to old - school children, housewives, and old people. Before the arrival of Kongu CR, these types of information were accessed only through newspapers and AIR (*Vayalum Vazhvum*) once in a while. Now they listen to all the programmes on a routine basis. Many times some programmes which are aired in the mornings are again rebroadcast in the evening.

The ten volunteers associated with the CR look for new ideas and they were trained to record and edit the programmes. Field interviews with the experts are also conducted by the volunteers like interviewing veterinary assistants. In that specific project Science for Women Rs.35 is given to the content provider/expert for 1 minute. For editing and data collection Rs.4/minute and transport and other costs it is Rs.10/programme. The impact is assessed through letters and phone calls they receive in response to the programme. On an average a minimum of at least 2 calls are received in a day and a minimum of 4 letters per week.

Realising the potential of community radio, the University of Agricultural Sciences (UAS), Dharwad launched the Krishi Community Radio in May 2007. The channel with the catch line '*Raitarinda Raitarigagi*' (by the farmers for the farmer) deals with issues related to agriculture, health, nutrition, hygiene and income generation activities of farmers (Balasubramani, 2009). The programmes are aired for three hours in the morning and three hours in the evening every day and it is delivered in Kannada language mainly in the local north Karnataka dialect in various formats (drama, talk shows, interviews, phone-in-programme etc)

Sangham Radio, established by the DDS in 2008 at Medak is another community radio in India. This radio is managed and operated by women. The radio's team of reporters collects stories related to agriculture, education, health issues, women empowerment and local culture, which are then edited and mixed with interviews, discussions, folk songs and drama. Sangham Radio focus on issues such as food and seed sovereignty, bio-diversity, herbal care, ecological agriculture, legal education for women etc. This CR station was set up at a cost of

Rs. 30 lakhs with UNESCO funding. DDS bears the maintenance and production costs of around Rs. 2.5 lakhs per year. Around 2,000 sangham (rural women collectives) women members contribute Rs 1 lakh a year to keep the station operational (www.ddsindia.com).

Kalanjiam Samuga Vanoli, initiated by DHAN Foundation is another community radio initiative in Nagapattinam District, Tamil Nadu. The station was set up with UNDP funding under its “Tsunami Restoration Initiative”. The activities are managed by *Keelaiyur Vattara Vayalagam*, a federation of farmers groups promoted by DHAN foundation among the tsunami affected communities. This CR addresses local information and community needs that revolve around disaster preparedness, local best practices, women and children, health, education and farming (Murthy, 2007).

3.2.6 Video

Use of videos for disseminating new information and knowledge is not new. Several agricultural extension projects including the Training and Visit (T & V) used videos to bring about awareness on certain agricultural practices. The cost of production as well as screening of videos has fallen dramatically during the last one decade. The video based approach, especially following a participatory content generation has several advantages over other media. Apart from the audio and visual elements that make videos attractive, participatory production ensure that they are customized to the local situations.

Its immense potential for women’s empowerment was first spotted in India by Self Employed Women’s Association (SEWA). Video SEWA (VS) was established as a means to provide training to the members of SEWA and to motivate, mobilize and strengthen the existing membership of SEWA through the use of video recordings and tapes. Since 1984, Video SEWA has produced countless tapes and more than a hundred programmes of organizing, training and advocacy (Box 14).

SEWA is currently working in 15 districts of Gujarat, nine states in India and three other countries. However, VS is so far confined to Gujarat as they are trying to make themselves self-sustainable. However, the videos produced by VS are used for capacity building and demonstration purposes across the SEWA network.

Box 14: Video SEWA

Established in year 1984, Video SEWA (VS) has been working towards bringing technology into the hands of common people and using video as a tool for development communication. The VS team includes members from the informal sector like head loaders, vegetable vendors, home-based workers etc, who after joining VS had undergone technical training and today are producers of various educational and informative programs. Their experiences have taught them that the visual media is one of the most powerful tools for communicating to a worldwide audience and for reaching out to a vast majority of members in SEWA. Since watching videos doesn't require a high level of literacy or skill, it can be used as a tool to reach the audience that is marginalized by the mainstream society.

In 2002, VS got itself registered as a co-operative "*Shri Gujarat Mahila Video SEWA Mahiti Communication Sahakari Mandali Limited*." Its objectives are as follows:

- To spread information about themselves, their work among themselves and other interested;
- To use video as a tool for training and teaching new skills or ideas or designs or methods of doing things to its members;
- To raise awareness among members about the social or economic issues that are central to poor and working women and using video as a tool to articulate their problems and demands and formulating strategies;
- To inform members about government policies and programmes for the self employed, including national development plans and programmes;
- To create visibility and initiating policy changes for the issues related to the women by addressing decision makers and policy makers
- To forge fresh connections and wider sharing of information with the SEWA members and with the world outside thus bridging the gap between various groups, women and technology.

They use mobile van twice a week for showing videos to the communities. There is portable TV in the van which they use for telecasting programmes. They also conduct skill development trainings to enhance income generation for women like photography trainings.

The strengths of VS is their advanced training crew, digitally equipped studio, cadres of spearhead team and a co-operative structure of organization. The technology used by them has upgraded with time from U-matic to beta to high 8 and finally digital. They are aiming at achieving self-sufficiency by conducting trainings, selling footage to organizations like BBC, giving equipment on hire, producing films for other agencies, selling documentaries, giving the studio on hire, etc.

So far they have been able to meet 70% of their costs through raising funds from all the above mentioned activities. However marketing is an issue and they are struggling to do it in a more commercial manner. They do not have accreditation card that is used by all other media organizations. Despite continuous efforts for the same they are unable to obtain it. Without this they are unable to make video programmes for government departments or any other reputed institutions.

The DDS at Medak, Hyderabad has been experimenting with participatory video with disadvantaged women (with which it is working) to share their valuable knowledge and to express themselves. Handling the camera also gives visibility in the community and empowers the women to document the stories of the community. During the training sessions the women were taught to handle cameras, edit, choose themes and film their community efforts (Raman, 2010).

Digital Green (DG) is an initiative that seeks to disseminate targeted agricultural information to small and marginal farmers in India using digital video. DG has been enabled by recent advances in digital video technology, including low cost camcorders and PC solutions for editing digital video. These advances greatly lower the cost of the system, and also allow local development of video content. DG produces videos that are instructional in nature, mainly recordings of demonstrations that are made when an extension agent is teaching farmers a new technique. Content producers can be university scientists, NGO experts, field staff, progressive farmers and other volunteers from the community.

One of the crucial aspects of DG is the inclusion of local farmers in these instructional videos. The videos are also localized to a region and feature the participation of familiar farmers as opposed to experts in idealized conditions. The videos are edited and then digitized on a PC. These videos are then uploaded in the DG web repository and are also physically mailed or couriered to villages where a minimum of one TV and one DVD player is provided. The mediators or the local resource persons organize screening of these videos in the evenings (mostly between 7.00 PM to 9.00 PM). These mediators transport the equipment to different locations and conduct at least three screenings per week. A show normally involves small groups of 20-30 farmers who are willing to come to gather at a common site within a short distance from their homes. The mediators make the content active- they reiterate concepts between clips, ask questions to gauge comprehension and announce follow-up visits and subsequent screenings (Gandhi et al, 2009).

The emphasis of DG is on the development and delivery of digital content to improve the cost-effectiveness of organizations involved in agricultural research and/or extension. The goal is to strengthen existing institutions and groups; not to create new ones and it partners with other NGOs in the field such as Green Foundation, PRADAN, BAIF and SPS. Currently it works with over 15000 farmers spread over 200 villages and it is set out to reach to over 1200 villages in more than fifteen states of India (Talukdar, 2010). “The DG system is able to multiply the value of NGO’s extension agents by a factor of 10 times per dollar spent. Locally hired mediators ensure that farmers are engaged within a framework that progressively enables them to achieve sustainability in their operations” (Gandhi et al, 2009).

3.2.7 Digital Photography

The arrival of digital cameras and the possibilities for online distribution and exchange of digital images have opened up new avenues for interactive and collaborative problem solving. The potential of this technology in agriculture was tested and found effective in India by e-Sagu, a project implemented by the International Institute of Information Technology (IIIT), Hyderabad since 2004-05 with funding from Media Lab Asia under the DIT, Government of India. A similar initiative called e-*Velanmai* is currently piloted by TNAU at Coimbatore and this initiative was started in July 2007.

E-Sagu is a tool for IT-based personalized Agro-Advisory system. (“Sagu” means cultivation in Telugu language). It aims to improve farm productivity by delivering high quality personalized (farm-specific) agro-expert advice in a timely manner to each farm at the farmer’s door-steps without farmer asking a question. The advice is provided on regular basis (typically once a week) from sowing to harvesting which reduces the cost of cultivation and increases the farm productivity as well as quality of agri-commodities. In e-Sagu, the developments in IT such as (database, Internet, and digital photography) are extended to improve the performance of agricultural extension services. In e-Sagu, rather than visiting the crop in person, the agricultural scientist delivers the expert advice by getting the crop status in the form of digital photographs and other information (Reddy and Raju, 2007).

The main components of Esagu are as follows:

- farmers who are the end users;
- the co-ordinators who are educated and experienced farmer of the village;
- agricultural experts qualified to provide expert advice;
- agricultural Information System and a Communication System to transmit information between farms to agricultural experts and vice versa.

Information can be transmitted either through courier service or dial up internet connection. Farmer registers into the system by supplying soil, water, crop details by paying Rs.500- per season. Coordinator visits each farm once in a week. The Co-ordinator takes pictures of crop growth or symptoms of affected parts in a digital camera of 4 mega pixel size. The data is written into CD at the village computer center. CD is sent to main e-Sagu lab by courier/post.

Agriculture scientists prepare advice based on photographs and other information. The advice is downloaded at the village center through a dial-up Internet connection. The coordinator delivers the advice to the farmer. The co-ordinators are either educated progressive farmers or qualified rural youth that possesses adequate farming knowledge and are generally selected from the same village and trained by experts of IIIT and each co-ordinator is associated with a group of farmers. The co-ordinator visits the crops on a weekly basis and sends crop details in the form of text and digital photographs through the internet.

This system was initially tested at Warangal district of Andhra Pradesh during 2004-05, for Cotton crop covering more than 1000 farms. In the year 2005-06 e-Sagu was scaled up to cover 4894 farms in 6 districts of Andhra Pradesh in diverse agri-ecosystems. In the year 2006-07 an entrepreneurship model of e-Sagu was implemented with a view to provide allied services such as agri-inputs and finance to the farmers. Mobile phone based e-Sagu services were introduced to improve the agro-advisory turnaround time. Studies have shown that e-Sagu operation has improved the access, knowledge and technology adoption rate as compared to their counter parts in non-project area (Reddy et al, 2006).

'e-Velanmai' (velanmai means 'agriculture' in Tamil language) is a project implemented by the Water Technology Centre, TNAU since 2007, as part of the World Bank aided TN-IAM WARM project implemented by the Government of Tamil Nadu. The e-velanmai model was started in October, 2008 at the Kumarapalayam Water User's Association (K-WUA) in Palar basin. The objective of this project is to provide expert advice in a timely manner to the farmers of K-WUA using ICT tools like digital camera, internet and mobile phones through a field co-ordinator once in a week or on need basis. Farmers pay a membership fee (Rs.50-300) based on the farm size owned by them to avail the extension services under e-velanmai (Box 15).

e-Velanmai is organized as follows:

Step 1: Any member farmer who has a problem calls the field coordinator over mobile phone. Decision based queries like choice of variety, market information are delivered over phone directly without photos.

Step 2: The Field Coordinator inspects the farmer's field and frames digital images of the infested parts of the crop and transfers the photo using the laptop and internet surfing device

which is available in each sub basin under the project to the expert team set up at TNAU. (Some progressive farmers, who are well trained, send the photos by themselves directly to the experts). Usually the photos are uploaded for advice before 1 PM every Monday to Friday.

Step 3: The expert team analyses the symptoms via the photos received and offer technical advice to the field coordinator or directly to the farmers on the same day between 2 and 3 PM using telephone or through e-mail. The advices are recorded in the membership card by the Field Coordinator and he/she guides the farmer in adopting this recommendation. This builds the accountability for the services rendered and facilitates the follow up activities. The turnaround time to disseminate the technologies was 3-6 hours on the same day.

Box 15: Interactions with the Kumarapalayam Water User's Association of Palar Basin, Sultanpettai

e-Velanmai project was started in 2008. There are 19 farmers as members of this water users association. Their main crops are coconut, banana, maize and vegetables such as brinjal, onion and tomato. Public extension services are not reaching them and the extension services by the private local input dealers are not effective in dealing with their problems. In this context e velanmai project is a gift to the farming community of the area.

The Field Coordinator takes the photos and mails the same to the University for prescription by the experts. The farmers are being trained by the field coordinator to take photos and analyse the symptoms for their understanding. In the initial phase of the project, it has taken a minimum of 1 week to get the results. Now it takes only 2 days to get the results delivered.

The farmers feel that the recommended pesticides have to be made available with the e-velanmai team for the main crops of the region. Quite often the recommended pesticides, fertilizers and seeds are not available with the local dealers. Once the project is withdrawn, they think they might have to again depend on the local dealers. To overcome this situation, they opined that a local volunteer might be trained fully with all nuances in taking photography and other computer activities, so that he can continue doing the job of a field coordinator. Though farmers are trained often in taking photographs, it is not possible to own a camera by each and every farmer. So if the local volunteer is trained, he can charge for taking the photographs and other services. The volunteer can charge fees for visits to the farms.

So far, 1116 farmers paid membership fee and availed the e-velanmai mode of technology transfer services. Scientists associated with the project reported that the advice received through e-velanmai helped several farmers to improve their farm profit by achieving higher input use efficiency and by adoption of appropriate dose and type of inputs like seeds, fertilizers, water and pesticides. Some of the success stories documented so far also revealed several positive impacts attributed to e-velanmai such as timely dissemination of appropriate technologies, savings in terms of time and efforts to access technical advice etc.

Seeing this success, e-velanmai model is going to be up scaled in 22 sub basins of Tamil Nadu during 2010-11 under the IAMWARM project. In the initial phase of this project, Senior Research Fellows are appointed and they acted as the field coordinators. High pixel Cameras and laptops are provided to the SRFs from the project funds. The project is also training local youth to take it forward once the project is over in 2012 to ensure sustainability.

3.2.8 ICT based enterprises

Rapid growth of the Indian IT and ITeS sectors has created a lot of new jobs in the country. Over the last decade, the IT and ITeS industry in India has grown from 8.7 billion US dollars to 64 billion US dollars. Currently 20% of India's export earnings come from this sector. About half of all incremental employment created in India comes from this sector. Women account for 30% employment in this sector, though a vast majority of them are relegated to call centre jobs and other lower ends of the BPO sector. Though much of this employment has been created in the cities and this has been the forte of urban educated women, recent developments in this sector are throwing up new opportunities for rural women.

More and more IT and BPO companies are moving to rural areas to beat the global competition, cut costs and ride out the recession. Low cost of operations and lower employee's attrition levels are the key benefits these companies derive from their rural operations. Call centre and medical transcription companies are slowly moving to tier-III areas where they can cut costs. "According to Nasscom, there are currently about 50 rural BPOs, employing about 5,000 staff. The 2015 projections being put out by 11 rural BPOs are staggering: about 1,000 centres and 150,000 employees. While the numbers might be an optimistic appraisal, there's a mass of anecdotal evidence — from clients, rural BPOs and related constituencies — that points to a definite build-up" (Singh, 2010)

Desi Crew Solutions is a rural BPO company that started operations in February 2007, after two years of testing at the Rural Technology & Business Incubator, of IIT Madras. It operates on a decentralized BPO model that provides competitive outsourcing solutions to clients, while thriving as a profit making social enterprise giving employment opportunities to the educated villagers. This 120 people company runs 6 village centres in Tamil Nadu and 70% of its staff is women. A 12th pass and basic knowledge on computers is the minimum requirement for consideration for employment at DesiCrew.

Desi Crew started off with digitization services such as data entry and data conversion. Over a period of time, it added services such as content creation and validation, GIS based mapping services, transcription and localization (Narayanan, 2009). The Chennai office acts as the interface between the client and the rural centres. By working out of tier II towns and villages, the overheads are lower, which is passed on to the client in form of lower costs. While the villages gain from the employment opportunities and the infrastructure, the client gets a cost advantage of up to 40% of their current costs. With an annual turnover of Rs. 1.76 crores, they dream to employ 1000 crewmates and expand to villages outside of Tamil Nadu (Srin, 2010).

Another case of a rural BPO is from the Teekli village in Haryana, near Gurgaon, where the firm HarVa has employed twenty rural women to manage a rural BPO (Box 16).

Box 16: ICT and employment: HarVa BPO, Teekli, Gurgaon, Haryana,

HarVa stands for “Harnessing Value” of rural India. HarVa is an outsourcing company with a rural focus that primarily focuses on skill development, BPO, community based farming and microfinance. HarVa set up its rural BPO in Teekli village in March 2010. HarVa trained two hundred women in Teekli for free, put them through rigorous training for three months on English and computer skills learning programme. Out of the trained women, the present batch of employees has been drawn. It was an uphill task to convince villagers to allow their women to attend training. Women who had studied till standard 8th were considered for this training. They believe that one does not have to be a graduate to be a BPO employee. It is currently planning to expand to Uttarakhand and Bihar and replicate the model.

HarVa currently employs twenty women at the Teekli center. The rural women employed with HarVa earn in the range of Rs 2500-4000 a month. They are mostly involved in data entry operations for various clients- insurance companies, legal firms etc. One of HarVa’s clients is the Department of Animal Husbandry, Government of Haryana. The animal-census data of the Department of Animal Husbandry are entered from the handwritten forms to Microsoft Excel sheets on the computer by these trained rural women

Women feel blessed to have such an opportunity at their doorsteps to supplement their household incomes and be independent. It has not only provided them with employment but also empowered the rural women of Teekli by enhanced learning and motivation. Women work together irrespective of their caste at the center and eat the packed lunch together like any other office environment. They are mostly young married women who take off their ‘*Ghungats*’ (head cover) when they approach the center. Since it provides women work within their village and that too options to work at convenient timings [flexi hours] and earn money, it is a heaven sent opportunity for the women who had no means of going out in search of work mainly due to the social barriers existing in the community.

Kudumbasree (which means prosperity for the family) is a poverty eradication project of the Government of Kerala, being implemented in the state through the local bodies since 1998. The project gives importance to women and children from Below Poverty Line (BPL)

families and is being implemented through neighbourhood groups, which are formed by 15 to 40 members. Kudumbasree encouraged and trained the poor educated women from the neighbourhood groups to form enterprise groups to set up micro-enterprises based on ICT applications. Each group was motivated to set up micro-enterprises for data entry, data processing, and IT education. As on 2006, two hundred and thirty six such units exists, which are spread over the 14 districts (Box 17). Based on their activities, these units can be divided into three categories, data processing units (80), IT@ School units (151) and hardware units (5) (Pillai and Shanta, 2008).

Box 17: ICT based enterprises by poor women groups of Kudumbasree

Under Kudumbasree, the first micro-enterprise unit was started in Trivandrum on 15, September 1999. The unit was named as Techno World Digital Technologies. The required capital was mobilized through the subsidy under self-employment scheme and through a bank loan. The unit, which started with five computers, presently has ten computers and all other related accessories to handle any type of data entry and data processing work.

In a span of seven years, more than hundred ICT micro-enterprises have been established throughout the state and these provide employment to 1500 women who belong to BPL families. Majority of the units are engaged in ICT applications like data entry, data processing, DTP works, E-mail service and IT education. These micro-enterprises owned by poor women functioning in various locations have established credibility and they are getting regular work for data entry, data processing, and DTP works from various government and private organizations. They even compete with big private and government companies and emerge successful in getting state level contract for data entry and data processing.

The data entry work of revenue cards for the whole state, state level BPL family survey, election identity cards etc. are some of the state level projects, which are being handled by these units. Some of these units are engaged in software development, web design and manufacture and supply of computers. For each unit, there are 10 women entrepreneurs who were drawn from BPL families as promoters. These micro-units have an average investment of Rs 0.25 million, 50 percent of which is subsidy and the balance is bank loan. These women are able to earn average monthly income of Rs. 3500/-

Source: Prasad and Sreedevi (2007)

The most important and positive factor favouring women's entry into IT industry has been the support from Kudumbasree officials in the form of financial, technical and managerial help. The major help came in the form of training both in hardware and software. This gender focused, interventionist ICT initiative involving significant state intervention brought about positive changes to livelihood outcomes and empowerment of economically poor women (Arun et al, 2004). However, there have been some limitations too. For instance, "while the agency has concentrated on the supply side, the demand side aspects such as output demand, market research, customer service etc have been largely ignored. Poor women through this programme have entered the lowest of IT enabled jobs. If this good beginning has to be sustained and poor women have to take advantage of the opportunities offered by the IT

revolution, they should be helped to move to higher levels of activities with more intense training (continuous up-gradation of skills) and organisational support” (Pillai and Shanta, 2008).

Under the rural e-Seva centres, initiated by the Government of Andhra Pradesh in West Godavari District, web-enabled rural kiosks were established to provide a large number of citizen services. Initially the project started in all 46 *mandal* (block) headquarters in the district, with the first women's e-Seva centre opening in June 2002 (Veldanda and Jaju 2005). Out of the 46 bigger e-Seva Centres at mandal headquarters, 20 are managed by women. Women from SHGs took loan to set up this initiative (computer, printer, digital camera, scanner, photocopy machine) and all these centres are running profitably.

Establishment of CSCs is also opening up employment opportunities for women in rural villages. For instance, Srei-Sahaj, the company partnering with the Government of India for setting up and operating 27,000 CSCs in seven states of India, has 1200 women entrepreneurs today (Chatterjee, 2010). They are mostly housewives, who had no previous experience of running a business. Till date Srei-Sahaj has rolled out 12000 plus CSCs across the 6 states (West Bengal, Uttar Pradesh, Tamil Nadu, Orissa and Assam) and these centres offer a number of services including photography, government form submission, electricity and telephone bill payment, mobile top-ups, railway reservation, LIC premium collection etc.

3.2.9 ICTs in support of existing enterprises

ICTs are increasingly used by rural co-operatives (e.g. Amul) and women enterprises (e.g. SEWA) for enhancing efficiencies and to compete in the domestic and international markets. It also saves lot of time for women who are involved in many of these operations.

For instance, adoption of Automatic Milk Collection Unit Systems (AMCUS) at village societies by the Gujarat Co-operative Milk Marketing Federation (GCMMF) is not only ensuring transparency but is also giving co-operative societies a unique advantage by reducing the processing time for milk recording and payment to 10 percent of what it used to be prior to this. The IT system enables prompt, accurate, and immediate payment. The queues at the centres are short despite the number of people selling their milk being quite large. Needless to say, women play an important role in dairying in Gujarat and elsewhere and they

are the ones who bring milk to the societies every day. GCMMF indeed got the entire supplier information through the systems integration. The information related to members, fat content, volume of the milk procured and the amount payable to the members are accessible to the co-operative society in the form of a database. Thanks to the use of IT, both transparency and trust have been enhanced (Bowonder et al, 2010).

SEWA has effectively used ICTs to improve the efficiency and reach of its operations. The SEWA Trade Facilitation Centre (STFC) showcases members' products online, facilitates business-to-consumer sales, builds business-to-business links and empowers members to ride the ICT wave. The STFC experience of training rural and urban women in using ICT to gain increased access to markets can offer lessons to women's cooperatives elsewhere in the region (UNESCO, 2004). STFC has also introduced a bar-coding mechanism for its products. All these provide a number of advantages. These include the acquisition of much needed market research, superior management of inventory levels, greater standardization and thus a more optimal utilization of time and resources throughout the organization thereby helping it to accomplish its fundamental objective of providing greater livelihood security to its members (World Bank, 2002).

Table 1 given below presents details on how different ICTs are applied for rural empowerment in India.

Table 1: ICT applications employed for rural empowerment

	Functions	Content	Delivery Format
<p>Radio (e.g.: Regular programmes such as Farm and Home, <i>Kisan Vani</i> and special programmes such as <i>Poshan aur swasthya</i> on food and nutrition)</p> <p><i>Gyan Vani FM</i> – dedicated FM stations for educational broadcasting in collaboration with Indira Gandhi National Open University (IGNOU)</p>	<p>Dissemination of information</p> <p>Distance Education</p>	<p>Information on technology, critical farming practices relevant to the season schemes of the government, advertisement on new products, commodity prices in different markets, weather etc</p> <p>Talk with experts on new technology, dealing with health problems, promoting better nutrition, child care</p> <p>Educational programmes of open universities</p>	<p>Special agricultural programmes: as news announcements, talk by farm experts, phone-in-programmes (both recorded and live)</p> <p>Agricultural programmes for 30-60 minutes every day in the morning and evening hours- some of the programmes are also re-broadcasted again</p> <p>Rural women programmes of 15-30 minute duration once or twice a week</p> <p>Farm School on AIR in collaboration with educational and research organizations with registered groups of producers</p> <p>Educational broadcasts(daily) mostly in classroom lecture format and interactive radio counselling (once a week/month)</p>
<p>TV (e.g.: <i>Krishi Darshan (Hindi)</i>, <i>Annadata and Jaikisan (Telugu)</i>, <i>Krishi Deepam(Malayalam)</i>, <i>Pon Vilayum Bhoomi (Tamil)</i>, <i>Kalyani (Hindi)</i>)</p> <p><i>Gyan Darshan</i>- dedicated TV channel for telecasting educational programmes in collaboration with IGNOU</p>	<p>Information dissemination</p> <p>Distance Education</p>	<p>Information on technology, critical farming practices relevant to the season, schemes of the government, advertisement on new products, commodity prices in different markets</p> <p>Talk with experts on new technology dealing with health problems, better nutrition, child care</p> <p>Educational programmes of open universities</p>	<p>Announcement in news format, Talk by experts, Question and answers through phone-in-programmes (recorded and live), Demonstrations, Success stories</p> <p>Agricultural programmes for 30-60 minutes every day in the morning and evening hours- some of the programmes are also re-telecasted. Health and women programmes once or twice a week</p> <p>Daily telecast of educational programmes</p>

<p>Print media: Most vernacular dailies and special magazines in local languages (e.g.: <i>Annadata</i> (Telugu), <i>Karshakasree</i> (Malayalam), <i>Adike Pathrike</i> (kannada))</p> <p>Women magazines (e.g.: <i>Vanitha</i> (Malayalam), <i>Mangaiyar Malar</i> (Tamil) <i>Swati</i> (Telugu))</p>	<p>Information dissemination</p>	<p>Information on technology, farming practices to be undertaken this month, advertisement on new products</p> <p>Advertisements sponsored by the Government on new programmes and as part of social development campaigns on agriculture, health, environment, rural development etc</p> <p>Health, nutrition, employment, home remedies, fashion</p>	<p>News reports, question and answer, tips, articles</p> <p>Dailies-Atleast one page every week One exclusive daily on agriculture</p> <p>Magazines- one or two issues per month- experience sharing by entrepreneurs, ask the doctor/scientist, health tips, farm operations for the month etc.</p>
<p>Internet-enabled computer centres (Information kiosks/ knowledge centres/ common service centres/ telecentres) Village Knowledge Centres (MSSRF) Common Service Centres of GoI , Akshaya centres (Kerala), Gramin Suvidha Kendra (Uttar Pradesh) of MCX in collaboration with the Department of Posts, Government of India</p>	<p>Dissemination of information</p> <p>Training in computer skills</p> <p>Also as a forum for interactive learning when centres are owned/managed by rural development NGOs</p> <p>Distance learning</p>	<p>Wide variation in content depending on the objective of the centre, ownership, governance, revenue model etc,</p> <p>Information on government services, market prices, technology, weather, availability of inputs</p> <p>In few cases, locally relevant content in local language</p>	<p>Information available in the computer to be made available mostly through an intermediary located at the centre.</p> <p>Also in combination with other media (notice boards, public address system, mobile phone etc)</p> <p>Normally during the day as long as the centre remains open</p> <p>(average about 10 hours during the day)</p>

Portals India Development Gateway, Agriwatch, AGMARKNET, aAQUA, Agropedia, Rice Knowledge Management Portal (ICAR and partners) Education Portal (e.g.: Sakshat) Health (e.g.: www.medindia.net)	Dissemination of information E-commerce	Information on crop production, management and protection, Agricultural statistics, news, Information on inputs (sources), Dissemination of price information in various markets across the country E-commerce- Linking producers to traders/consumers In few cases, on-line query management (question and answer forum) Access to online resource documents for education Information on different health ailments, health tips, treatment options, contact details of hospitals	Portals vary widely in their content, regular updates, user friendliness, use of visuals Most of them provide generic information. Increasingly the portals are providing dynamic information (e.g.: current prices and weather updates)
Call Centres Kisan Call Centre-1800-180-1551 Health help line (eg-104 Advice, Andhra Pradesh) Distress help line (e.g.: Bhumika, Andhra Pradesh)	Dissemination of information and interaction with experts, especially advisory communication	Information on technologies, crop protection, sources of information, e.g.: advice to addressing specific problems answered by experts) Information on Government health programmes, contact details of health service providers, counselling services on HIV Counselling and legal advice	Answers on specific queries by experts located at call centres and at other locations Available during fixed hours during the day and in some cases 24 hours
Mobile Reuters Market Light (RML), IFFCO-IKSL; Tata m-Krishi),	Information dissemination Different kinds of	Information mostly on weather, prices of commodities in different markets, crop and animal husbandry advisory services, government schemes,	Mostly paid services available to customers subscribing to these services. Mostly as text messages or voice mail sent over

	Information as provided by the service provider	conditions in the sea- eg: wave height	mobile
Community Radio (e.g.: Sangham Radio, Kongu FM radio, Mandakini ka awaaz, Krishi Community Radio)	Information dissemination Raising awareness Advocacy communication	Wide range of information on rural life, agriculture, forests, health, handicrafts etc. Greater the community ownership, greater the community involvement in generating locally relevant content.	Format vary-Broadcasting in most cases, but communities are adopting narrow casting and cable casting till they have resources to establish full-fledged station Content broadcasted in local dialects Mostly few hours in the morning and evening every day.
Video (e.g.: Digital Green, Video SEWA, DDS)	Information dissemination Advocacy communication Training Capacity Building Mobilisation Distance education	In agriculture, used to promote new technologies and good practices in farming Raising awareness on issues of women's concern, for mobilizing communities around issues of common concern and also used as a training tool	Screening instructional videos prepared locally to promote specific technologies with the support of a trained facilitator Screening videos in community meetings, training programmes and workshops with policy makers As educational CDs
Interactive CD ROM/ Touch Screen (e.g.: Touch screen kiosks, Pondicherry)	Information Dissemination	Mainly related to production of different crops or enterprises	Interactive multimedia CD-ROMS for use by farmers in cyber units or communication centres of the DoA, veterinary clinics or knowledge centres
Digital Photography (e.g.: e-Seva and e-Velanmai)	Providing information and advice on crop management	Advice based on digital photos depicting the growth of the crop and symptoms of pest and disease attack	Digital pictures mailed to experts and advice received through e-mail, mobile or as printouts Turnover time (1-3 days)

Video and teleconferencing (e.g.: Virtual academy for semi-arid tropics, IGNOU)	Information Dissemination Knowledge exchange Distance education Telemedicine- Increasingly supporting health workers to link with specialists (e.g.: eye care)	Depending on the nature of the problem being presented and availability of the expert (advisory on cropping, water and soil management) Quality of interaction and exchange based on the facilitation and intermediary skills of the rural infomediary as well as his understanding of practical agriculture Distance education at decentralized study centres of open university	Interactive discussions, question and answer session with experts and feedback on problems and technologies facilitated by an intermediary organization in the field Usually once in a week or once in a fortnight at the designated time, when the satellite bandwidth is specifically allotted for this activity
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4. RURAL WOMEN AND ICTs

4.1 ICTs and Development

Expectations and Performance:

Are ICTs really contributing to all round development? The jury seems to be still out. In the 1990s, at the height of the technology boom, rural ICTs were heralded as catalysts for ‘leapfrog development’, ‘information societies’ and a host of other digital-age panaceas for poverty. Now they have largely fallen out of favour” (Economist, 2005). World Bank was estimated to have funded between \$1 to \$2 billion on “ICT for development” projects, while InfoDev (the Information for Development programme hosted by the World Bank) has a budget of \$10 to \$15 million per year (Wakelin and Shadrach, 2001). It was felt that access to information (be it health, agriculture, education or government schemes) would at some level lead to individuals being able to act on that information and empowering themselves (Heeks, 1999). The impact of ICT-based projects has generally fallen well below the optimistic expectations generated by their protagonists, and consequently they developed a bad name in development circles (Beardon, 2005).

Though there has been a rapid expansion in mobile penetration and internet access globally, the digital divide still exists. “While in developing countries 72.4% of households have a TV, only 22.5% have a computer and only 15.8% have internet access (compared to 98%, 71% and 65.6% respectively in developed countries). The same is the case with fixed broadband subscriptions. While developed countries have 24.6 subscriptions per 100 people, the corresponding figure for developing countries is only 4.4” (ITU, 2010). The digital divide is significant between rural and urban India (Box 18). While the major metropolises are at par with some of the developed countries, the rural area in states such as eastern Bihar and Orissa are worse off than several of the least developed countries (Singh, 2010).

Box 18: India’s Digital Divide

Despite several policy initiatives to promote rural penetration, the total tele-density (the number of telephones (both landline and wireless put together) in use for every 100 individuals living within an area) in India is only 60.99. While in urban areas, the total tele-density is 137.25, it is only 28.42 in rural areas (TRAI, 2011).

Though the mobile subscriber base use has increased rapidly in the past few years, the rural mobile tele-density is only 27.32 (The corresponding figure for urban areas is 129.8). The rural mobile tele-density in states such as Assam, Bihar, Jammu & Kashmir, Madhya Pradesh, Orissa Uttar Pradesh and Uttarakhand are less than the national rural mobile tele-density (TRAI, 2011).

There are 46.49 million internet users in India as on January 2009, of this 39.0 million or 84% of online Indian come from the urban areas and 7.49 million or 16% comes from the rural areas (Juxt, 2009). The same study noted that the Internet use has “slowed down” in India. Lack of meaningful local language content and interfaces, the affordability factors, lack of confidence on transacting and buying online and the failure of cybercafés to mass mobilize its adoption and usage have all contributed to this slow down. As per 2001 Census, the rural female literacy rate in India is only 46.70%, and this also constrains women from accessing print media as well as portals.

The digital divide is also present in the case of traditional ICTs such as radio and television. As per Census 2001, 81 percent of rural households in our country do not own a television set and 68% of the rural households do not own a radio or transistor set. The percentage of households owning a radio or television is lower in rural areas as compared to urban areas. In rural television ownership there are glaring regional variations. In Southern and Northern India nearly a quarter of rural households have a television set and in Western India one in five households own a television set. However in Eastern India not even one in ten households possess a television set (Chandrasekher, 2004). A series of village surveys conducted by the Foundation for Agrarian Studies (FAS), found that the ownership of TV, radio, mobile phones, telephone and mobiles vary significantly across social groups. Inequality in the ownership and access to basic goods and services tends to mirror the inequality in the distribution of income-generating assets, particularly land (Sridhar and Singh, 2010). TV ownership was obviously low in villages where access to the electricity was low.

A significant number of villages in India are yet to be electrified. These are concentrated in a few states. As of 31 March 2010, 68.9% of villages in Jharkhand and 38.7% villages in Bihar are not electrified. 37.4% villages in Orissa, 28.5% villages in Rajasthan and 21.4% villages in Assam are also yet to be electrified (Ministry of Power, 2010).

The concept of digital divide has changed over time. Initially it was considered as connectivity problems but during the last few years, its understanding has broadened to include capacities and skills required to use ICTs (Singh, 2010). The digital divide currently represents the following four kinds of gaps:

- * gap in access to use ICT
- * gap in the ability to use ICTs
- * gap in actual use
- * gap in the impact of use

Sustainability

More and more people are now questioning the sustainability, scalability and impact of ICT pilots and experiments. Jhunjunwala and Aiyar (2006) observed that “only a few organizations in the country have taken up ICT initiatives in any comprehensive manner and have tried to build services which can be scaled and have a long term sustainable impact on the society. Most others have, at best, set up demonstration projects rather than sustainable ones. Reluctance to commercialize and scale these projects has led to their collapse as soon as the intervening agencies move out”.

E-choupal of ITC is perhaps the only one project that has proved to be financially sustainable. However, the *e-choupals* are distinct from other telecentre projects in that the value added is not in providing ICT infrastructure alone, but rather, in enabling efficiencies in the agricultural sector through greater information exchange and creation of an alternative market structure (Kumar, 2004). The common service centres (CSCs) currently being rolled out in India are expected to generate revenues through providing a wide range of services. While e-choupals are not targeting women, it is not clear, how far the rural poor are going to pay and avail the services of the CSCs. The village knowledge centres of MSSRF have been successful in localizing content and involving the poorest of the poor, women and members of the backward groups. But as the project neither aspired for nor attained financial sustainability, it would be listed as a failure, if financial sustainability is a criterion for success (IITB, 2005).

Many of the pilot ICT initiatives experimented in India were driven initially by ample donor funding and in recent years by government and business houses. Though many of the donor funded pilot initiatives provided new insights on application of ICTs and contributed positively to those who accessed these tools, (mostly in the immediate neighbourhood), a strong relationship between ICT and development on a wider scale are yet to be witnessed.

Costs

Investments related to establishment of ICT applications especially internet-enabled computers has been a matter of great concern. However, advent of cheaper mobiles, its new applications (Mobile 2.0) and cheaper network charges, have addressed this concern to some extent. Many believe that future of ICTs lies on applications through mobiles. “Access to mobile networks is now available to 90% of the world population and 80% of the population living in rural areas. Fixed (wired) broadband prices dropped by 42% between 2008 and 2009 but there are huge difference among countries when it comes to the affordability of broadband (ITU, 2010).

There is a lot of hype around provision of a range of information, especially market information through mobiles these days. But the links between availability of market price information and better price realization are not that direct (Lehr, 2007; Mittal, et al 2010). “While ICTs and specifically Mobile 2.0 based agricultural applications do have a role to

play in reducing transaction costs, for small farmers to engage more effectively in agricultural markets, other constraints such as access to credit and relevant infrastructure (from transport to storage) need to be met” (Lokanathan and de Silva, 2010).

Stand alone Vs Integrated ICT projects

A common criticism of ICT for development projects is that they fail to build on existing systems of work in a participatory manner and therefore do not achieve local input and local ownership. There is often a gap between the design of an ICT project and the reality of what can unfold on the ground and the long-term implications for women (Melhem and Tandon, 2009). A broad range of ICTs exist, each having its strengths and weaknesses with respect to the context in which it has to be used. It is the context, that should determine the range of tools that are relevant and the context is dynamic and the opportunities for converging different tools exist. In other words, there is no ideal ICT that fits all situations.

Keniston and Kumar (2003) indicate that there has been a tendency among well-wishing government officials, international agencies and NGOs to assume that ICT implementation is focused on a “computer in every village”, scattering of “information kiosks” throughout the nation and “universal computer-based education”. If the potential of ICTs have to be fully realized, this mindset has to be challenged. Based on the study of e-choupal, Kumar, (2004) concluded that, ICT projects can be financially sustainable when they are viewed not as an end in themselves but as tools to facilitate information exchange whereby, use of the technology enables higher efficiencies in another existing or new business setting, which provides the source of revenue to recover the initial investment.

4.2 ICTs and Rural Women Empowerment-Evidence from India

In the previous chapter, we tried to illustrate the applications of varied ICT tools with special emphasis on its access by women. India has a large number of ICT pilots implemented by different kinds of organizations. We tried to look at a cross-section of initiatives to see how far these initiatives are trying to address the concerns and needs of rural women. To organize the study, we looked for select experiences with use of different ICT tools, including both traditional and new ICTs. These include:

Traditional ICTs

a. Radio

- b. Television
- c. Print media

New ICTs

- d. internet enabled computers (information kiosks, telecentres, knowledge centres, information centres, common service centres)
- e. Portals
- f. Call centres
- g. Mobile
- h. Community Radio (CR)
- i. Video
- j. Digital photography
- k. ICT-based enterprises
- l. ICTs in support of existing enterprises

The review of several experiences with use of these ICTs led us to the following set of findings (Box 19).

Box 19: ICTs and Rural Women: Findings from the current review

- ICTs do play an important role in disseminating a wide range of information and advice leading to knowledge and attitude change among rural communities. It is also supporting rural communities to acquire new skills and is also creating new employment opportunities. However, the continuing digital divide between urban and rural areas and between men and women currently constrain the realization of the full potential of ICTs in reaching rural women.
- Radio (All India Radio) and Television disseminate a wide range of information relevant to socio-economic development and these include agriculture, health, rural employment, environment, e-governance etc. Women who have access to these media have mostly benefited as passive recipients of information and advice. However with addition of new programme formats such as phone-in-programmes, these media are now becoming more interactive.
- Out of the different ICTs, only Community Radio (CR) and Rural Knowledge Centres (RKC)s were found to have an agenda and a mechanism for addressing the locally relevant information needs of rural women. But its extent of effectiveness is closely dependent on two sets of factors, namely, the extent of ownership and management by women in these initiatives; and agenda, focus and vision of organizations employing these tools.
- ICTs hold lots of promise for organizations working for the interests of women or having an explicit agenda for social inclusion, gender focus and pro-poor development.
- ICT-based enterprises have potential to employ more number of rural women who are educated up to 10th or preferably 12th classes, in the lower end of the BPO sector. There are also opportunities to train some of these rural women for self employment in the IT sector (data management, DTP, as trainers).
- In most of the other ICT initiatives that depend on print media, internet kiosks, portals, call centres, mobile, video digital photography etc, there is not enough evidence to show its wider access and use by women. This could be due to the following reasons:
 - These tools and its applications are intended for the rural communities without any specific attention for women's special needs for information and their constraints in accessing these.

- Men are specifically targeted in these initiatives as they take decisions on inputs, farm operations, marketing, accessing government schemes etc.
- The information provided through these tools are generic and so while it adds to the information base of rural communities including women, its lack of contextualization prevents both men and women from using this information effectively.
- Lack of adequate research on women's access to ICTs and the resultant lack of data, constraints any specific action that might be needed to improve women's access.

Though CR and internet-enabled computers of RKC's offer greater scope for reaching rural women with locally relevant and demand led information, these initiatives are currently constrained by various factors. There is lot of experience of using these currently and addressing some of these constraints can potentially improve women's access to relevant information.

4.2.1 Rural Knowledge Centres -- Content, ownership and financial sustainability

RKC's are basically 'telecentres' which are internet-enabled computer centres set up based on community ownership for providing locally relevant knowledge to rural communities. These are set up in a hub and spoke mode and uses other complimentary media to reach information to rural communities. Gender concerns and social inclusion are core principles underlying this project and financial sustainability is not the underlying or over-riding principle of the knowledge centre initiatives. Knowledge Centres are also used for a number of activities including training rural communities in IT-related courses, self employment etc. MSSRF also developed a tool kit to help others who are interested in setting up such centres.

Based on MSSRF's experience, three points are very important to start RKC's (MSSRF, 2005).

Firstly, it should be a people-centred programme based on community ownership. The community as a whole must endorse it.

Secondly, it must take into account the local context and the information needs of the local people. Only then it can provide useful demand-driven services. Although we may use a variety of technologies in gathering and reaching the information, the programme is not meant to demonstrate the power of technology. Usefulness is more important than the use of latest technology.

Thirdly, the programme should be inclusive and not be associated with one group or caste; it should allow everyone to take part. The ICT-enabled Knowledge Centre should be located in

a public space, say in a village school or *panchayat* building, to ensure social inclusion in access. The principles of social inclusion, gender equity, reaching remote areas and remedying regional imbalances should be built in the design of the RKC.

Based on its experience of setting up and managing RKC, MSSRF led a “National Alliance for Mission 2007”, a mission for mobilizing the power of ICTs for establishing such centres in 600,000 villages of India. The mission is currently renamed as *Grameen Gyan Abhiyan* (GGA). The sixth convention of GGA held in 2009 discussed the issues in taking forward this mission and one of the major issues that was discussed was about the “content” of such initiatives. Generally people focus on connectivity and content and capacity building do not get adequate attention. Repackaging and augmenting information (downloading, simplifying, translating, and adapting information into local languages,- and documenting and uploading local-origin information are critical steps for enhancing relevance and therefore increasing use of telecentres (Gurumurthy, 2006).

Who will support telecentres in generating local content? Do the public sector agricultural research and technology institutions have this locally relevant knowledge? Or how far they will support organizations and initiatives who are trying to generate locally relevant content? In the case of agriculture, Krishi Vigyan Kendras can potentially help in developing locally relevant content for the district, but their contribution in supporting such initiatives is not known. But information on crop production and management and information on prices are often not the priority for the majority of rural women. Studies have shown that “majority of rural women in rural areas are engaged in agricultural labour and livestock rearing and there is a need for information on small-holding livestock, small business ventures, value addition, marketing of products, and ways of improving remuneration and conditions of unskilled and migrant labourers’ (CRISP, 2009).

There are broadly two types of telecentres, namely the community model and the business model. RKC of MSSRF are of the community model, which is also a donor supported model. CSC is an example of the business model, which seeks to make a profit out of the enterprise to sustain the telecentre and the people taking it up as a livelihood or enterprise. While community model has several advantages in terms of providing locally relevant information and community ownership, there is a need for a gradual transition from donor dependency to sustainability (GGA, 2009). The cost of setting up one telecentre vary from as

little as Rs. 50,000/- to Rs. 500,000 depending on the number of computers, printers, scanner, internet connectivity, telephone and other media including display board, PA systems, touch screen kiosk etc. This is excluding the cost of generating appropriate content. One way of addressing this is to set up telecentres as part of existing facilities and institutions- health centres, schools, libraries and community centres- that provide a mix of services and potential cost structures based on cross-subsidisation (Gurumurthy, 2006).

In most of the other telecentre type initiatives there is no explicit focus of reaching rural women. Meera et al,(2004), based on their study of three such initiatives, namely, *Gyandoot*, *Warana* Wired Village project and I-Kisan, reported that all these projects had younger, better educated, male farmers as their primary users. Ansari et al (2009) reported that almost all the e-choupal users in Uttarakhand are men. Conroy's (2006) review of nine telecentre experiments revealed that "initiative operating under the profit making model target only people who have the money and literacy skills needed to utilize the services offered and this tends to be better off male farmer or villagers. In contrast, not for profit initiatives have sought to service poorer villagers, particularly women".

The dream of "every village a knowledge centre" is unlikely to be realized in the immediate future. One of the reasons is that the Government's current plan of establishing CSC in 100,000 villages to provide services mainly government services through village level entrepreneurs. The focus is on generating enough revenues to sustain this initiative and there is neither a provision for providing knowledge and information services to rural communities nor any specific attention on addressing knowledge and information needs of rural women.

4.2.2 Community Radio-Unlocking the potential

Till the beginning of this decade radio listeners in India had no choice other than listening to what is broadcasted over All India Radio (AIR). AIR stations had been operating in a centralized programme production mode and so it couldn't cater to the specific requirements of the rural Indian population in terms of language, programme content and concerns of the masses. Generally, no problems were defined and no target audience was identified (Thangaraj, et al, 2007). The power of CR lies in its participatory nature, as both its content and technology are people-centred. All the cases described in this paper, from Uttarakhand, Andhra Pradesh and Tamil Nadu reveal the potential of CRs.

Initially license was given to only educational institutions and subsequently NGOs with proven records also began to be considered. Many of the CR stations set up with donor support have demonstrated the potential of CRs. While some of them have set up full-fledged radio stations and have started broadcasting (as per the guidelines of the Ministry of Information and Broadcasting), some of them are waiting for their license to broadcast and are currently pursuing narrowcasting and cable casting their programmes. As per the guidelines issued by the Ministry of Information and Broadcasting, the programme/content should be of immediate relevance to the community and the emphasis should be on developmental, agricultural, health, educational, environmental, social welfare, community development and cultural programmes. At least 50% of the content has to be generated with the participation of the local community for which the station has been set up.

One advantage of the radio is that women can listen to the programmes even when they are doing household chores. This is especially important as women tend to have little time (and sometimes freedom) for going out in search of information outside their home or village. Though CRs offer the highest potential in terms of reaching rural women at relatively low cost with locally relevant content that could be decided, prepared and broadcasted by them in their own language and dialect, its potential remain locked due to a number of reasons. These are as follows:

a. Costs: The cost of obtaining the spectrum fees and establishment of a full-fledged CR station are high and communities and NGOs are finding it difficult to afford this expense. The Government charges Rs. 19,700/- as spectrum allocation fees for a range of < 15 km and Rs. 30,000 for a range of >15 km. (In hilly areas where the villages are spread far and wide, this uniform guideline doesn't make much sense). The minimum cost involved for setting up a CR station is between Rs. 350,000 to 400,000/- and the running costs for staff salaries, electricity, generator fuel, travel, etc would come to about Rs. 30,000 per month (www.gramvaani.org). It is almost impossible to generate resources (through advertisements at the rate of 5 minutes per one hour of broadcasting) to pay for even the operational costs and so organizations of rural communities are finding it difficult to establish such centres, forcing them to go with narrowcasting. Of the 103 CR stations established so far, 71 are with educational institutes, 24 with NGOs and 8 with Krishi Vigyan Kendras and State Agricultural Universities.

Though setting up CR stations is not a big deal for educational institutions and big NGOs that can raise donor funding, many are struggling to meet the operational costs for developing programmes with local participation. For instance, “the movement of field technicians to record field programmes and encourage people to participate in the phone-in-programme is restricted as there is no fund provision for travel allowance to the field technicians as well as for bringing farmers to the studio as resource persons. As a result there is less participation of farmers in programme development and participation from villages (Balasubramani, 2009). CRs are dependent on special programmes like “Science for Women” supported by Department of Science and Technology for developing appropriate content for women. When the funding ends, these kinds of initiatives are dropped.

b. Narrowcasting Vs broadcasting- Narrowcasting has several limitation with respect to reach and coverage. Though the community gets an introduction and experience into the new media, only broadcasting is the solution for effective reach and coverage.

c. Ownership, control, content and capacity- Community participation in content generation is the only way to make sure that the content is appropriate for the local population. Experience indicates that communities need intensive training and constant handholding to manage CRs. At present the role of NGOs is greater than the community. So if the focus of the NGO is on health, then the CR inadvertently becomes a medium to impart information on health issues and if the focus of the NGO is on environmental issues, the priority would be on transmission of environmental issues. Similarly if the CR is managed by an Agricultural University, most of the programmes would tend to focus on transmitting information on new agricultural technologies.

d. Co-operation from government departments- Many government departments lack knowledge about the existence of CR and its potential. Awareness about this media is essential for ensuring technical co-operation from these knowledge sources. Government should use CR as a medium for broadcasting the details of its health and education programmes and the reporters of CR should be given accreditation to cover government programmes.

e. Problems with frequency allocation- Signals from the powerful FM stations in the neighbourhood are found to suppress the signals of the CR. This is evident in the case of CR at Dharwad (KCRS) and Erode (Kongu FM).

The National Commission on Farmers (2007) recommended that “the Government should review its policy towards CR, since a combination of the Internet / cell phone and CR will help to take timely information to farmers even in the remotest parts of the country and judiciously harness ‘air waves or frequencies which are public property.’ It also suggested that the provision of CR licenses should be streamlined. We hope that the Government will look into this advice and act accordingly.

4.2.3 Human Intermediation-Organisational agenda and Quality of intermediation

The starting point for any successful gender-entrenched knowledge networking approach is the development of relationships that makes it easier for women to talk about their needs, share information and work together (Nath, 2001). ICTs hold lots of promise for organizations working for the interests of women or having an explicit agenda for social inclusion, gender focus and pro-poor development. Strengthening the ICT capacity of these organizations that have a history of working with disadvantaged groups, rural poor and women could be the best way of reaching rural women with ICTs. From the cases we reviewed it is clear that it is not the technology per se, but the vision of organizations and the working relationship it had with rural communities that is critical for using ICTs for rural women empowerment.

Organisations such as MSSRF, SEWA, DDS and Dhan Foundation has a long history of working with groups of poor rural women communities and they succeeded in implementing and sustaining ICT initiatives by leveraging funding from a range of other programmes. ICT should be an enabler in the larger context of development issues/programmes/works rather than being a full-fledged programme in itself. These organizations could afford to put in place, better qualified and competent people to support such ICT initiatives and they know quite often what kinds of information are important for the target communities and what ICTs and its applications are appropriate in a particular situation. For instance, in the village knowledge centres in Pondicherry, using the public address system is the best way to inform the rural poor on arrival/availability of grains under the Public distribution System (PDS). For

SEWA, while videos are appropriate for network building, training and policy advocacy; use of bar-coding and e-marketing are critical for managing its marketing operations and expanding its sales.

Human intermediation is always important no matter how advanced of superior a technology is. In the case of Digital Green, farmers sit and watch the video with interest, because the facilitator makes this viewing interactive by asking questions to gauge the comprehension, pause and replay the video if necessary and also announces follow-up visit and action. Role of intermediaries in bridging the “last mile connectivity” has been acknowledged in the literature (Colle and Roman, 2002; Heeks, 2002; Rajalekshmi, 2007, Sien and Furuholt, 2009). Heeks suggest that good intermediaries bring more to the process than connection to information and communication data and hardware (Heeks, 2002). Emphasizing the importance of ‘trust’, Rajalekshmi (2007) observed that while looking at e-governance services, it may be more appropriate to use the technology within existing intermediary institutions like local hospitals. It appears that ICTs have greater potential, if it is used to enable the enablers who are available locally.

4.2.4 Relevant Content- Addressing information needs of women

Though rural women are involved in a lot of agricultural operations, it is too naive to believe that all rural women are looking for information related to crop farming. Baseline study conducted for the project “Science for women” by Kongu FM at Perundurai near Erode revealed that women are looking for information related to child health, pregnancy, local health issues and seasonal precautions (KEC, 2008). Programmes on locally relevant issues such as forest fires, electricity, water woes, monkey menace, problems created by pigs in the farms, etc are more relevant for rural women in Chamba, Teri Garhwal (Box 11). At Bhanaj in Uttarakhand, information related to forests/forest fires, school, water purity/cleanliness, child care, dowry, superstition, medical remedies, etc are a priority.

CRISP (2009) study on aspirations of rural women in Minjur (Tamil Nadu), Gumma (Orissa) and Mawphlang (Meghalaya) blocks in India revealed that women consider, crop farming important for improving their livelihoods only in Mawphlang. In Minjur and Gumma, land-based activities are not considered important by the women. Non-farm activities, especially doing some business (grocery shop, tiffin centres, petty shops, retailing business (e.g., cloth

shop), tailoring) is considered by the communities as the main option for improving current incomes, especially in Minjur and to a considerable extent at Gumma and Mawphlang. Women are looking for information related to credit, input and marketing to engage in these activities. Eco-tourism is another area where women were seeking for information at Minjur and Mawphlang.

Though women are engaged in multiple roles in agriculture, the communities everywhere do not consider farming as the best option to improve their incomes. This has implications for all those who are trying to generate appropriate and locally relevant content for women through ICTs. “Some studies have also suggested that women view the potential of ICTs to provide livelihood improvements less positively than men (de Silva, 2008). This could be due to lack of appropriate content which women are interested in. Even if content is relevant, lack of support and services to use this information might also result in poor interest in seeking and appreciating the relevant information. This has been one of the weaknesses in extension and there is an increasing realization on the need for extension to play a capacity development role (increasingly called as extension-plus) that includes training, strengthening innovation process, building linkages between clients and other agencies, as well as institutional and organisational development to support the bargaining position of clients -rural producers, small entrepreneurs and women engaged in a wide range of farming, value addition and marketing (Sulaiman and Hall, 2004).

“Access to information through ICTs is a question not only of *connectivity* but also of *capability* to use the new tools and relevant *content* provided in accessible and useful forms. Connectivity has been a priority, and it is a pre-requisite for the other two “Cs” (Torero and Von Brawn, 2005). There is a close relationship between the mandate of the organization and the content provided by it through ICTs. For instance, a research centre working on dryland crops would concentrate on providing only information related to all aspects of managing dryland crops in their ICT initiative (knowledge centres, kiosk, IVRS, etc). Information related to production and management of crops and market price information might be of interest to men, but may not be a priority for women. ICT projects needs to find ways by which it could understand on a regular basis, the dynamic information needs of rural communities and women and create content in response to these needs. Based on a review of ICT projects in South Asia, de Silva (2008) reported that “ICT projects that successfully facilitate the information needs of the rural poor generally use participatory approaches with

target communities not just to articulate their information needs but often times to generate and disseminate the content locally”.

4.2.5 Opportunities for women in ICT-based enterprises

Evidence from our study indicate that rural women, who are educated up to 10th and 12th standard are getting benefited out of emerging rural BPO operations call centres, data processing firms etc. The case of HarVa and Desi Crew illustrate this trend. The call centre of the Andhra Pradesh Government (*Parishkaram*) employs 30 staff of which 18 (60%) are women and the minimum qualification for employment is 10th pass. It is not merely young unmarried women who are employed in these centres. Married women are also part of the workforces in these centres. Though women are employed at the low end of the BPO sector in low paid and less skilled employment, the opportunity to work near to their homes and villages compensate for the relatively low salaries (compared to better paid jobs in distant towns and cities available for better qualified staff).

The case of Kudumbasree also illustrates the potential opportunities for self employment in the IT and ITeS sector for women and the need for handholding and organizational support. Increasingly more opportunities are emerging for rural women to become entrepreneurs for CSCs. The case of Srei-Sahaj clearly illustrates this. A research study on women ICT entrepreneurs in Kerala revealed some of the problems faced by them. These include: difficulty in managing kiosk and household chores due to time constraint, inability to manage the kiosks during the night hours, where the chances of doing the business is high and the need to recruit male staff to manage the kiosks in the evenings and night etc. The resultant non-profitability resulted in the closure of some kiosks and reduction in the number of women entrepreneurs in the Akshaya programme from 85 to around 25 (Kumar and Ghatak, 2007).

ICTs can be used to promote basic literacy and education for women and girls, provide job training and prepare women for careers in the ICT sector. CSCs and knowledge centres offers scope for increasing the number of trained women who could be employed in ICT-based enterprises. However, Howcroft and Richardson, 2008 have pointed out that ICT-enabled service work offers limited benefits to women, especially the poor and have cautioned about drawing positive conclusions about the employment opportunities provided by ICT-enabled

service work and the prospects of advancement for women in developing economies. Heeks et al (2005) have developed methods for researching women's ICT-based enterprise for development and one may have to use these tools to understand this issue better.

4.2.6 Women's use of ICTs- Evidence from the ground

To understand better, the use of ICTs by rural women, focus group discussions were held with women in few villages in each block in four states (Tamil Nadu, Andhra Pradesh, Haryana and Uttar Pradesh. Though these villages were selected randomly from districts we have visited, we ensured that the selected villages are slightly interior (at least 5-15 km away from the block/district HQ) and at least a minimum of 5 km from the main road. The respondents were women who were willing to interact with us during our visit to these villages. Though the locations and the sample population were not selected based on any scientific criteria, the information collected from these locations provide an overview of the current pattern of use of ICTs by rural women (Box 20).

Box 20: Women's use of ICTs- Evidence from the ground

1. Thondamathur Block, Coimbatore District (Tamil Nadu) Women from the villages namely, *Thennamanallur, Poochiyur, Onampalayam, Deenampalayam and Pulluagoundanpudur* participated in these discussions. Coconut is the major crop in these villages and 50% of the total women population is engaged in agriculture (either as family labour or as agricultural labour). Almost every woman (90%) is literate and has a mobile phone or has access to mobile, but these are used for talking to others. Out of thirty women, five women said they have used the mobile in a few cases to talk to the staff of Agricultural Department and the local input dealer. Almost every house has a television, but except two, none has ever used it to watch agricultural programmes and they use it for entertainment. These two remember seeing programme on organic farming and bio-fertiliser production in the TV. Many knew the existence of Kisan Call Centre as they have been advertised in the media recently, but they haven't used it so far. Only 40% has a radio at home, but this is used mostly to listen to songs. Five women out of this thirty have seen the agricultural newsletter of SPIC (fertilizer company) and farm magazine *Pasumai Vikatan*, but haven't applied any information which they have read/seen in these magazines.

2. Thurkapalli Mandal of Nalgonda District (Andhra Pradesh) Women from the villages namely *Malkapur, Mulkalapalli and Roosthapur* participated in the discussions. These villages are in a very dry tract receiving very scanty rainfall. Maize, paddy, jowar and castor are the main crops and red gram is raised as an intercrop. 45% of the total women population is engaged in agriculture and many are dependent on NREGA works. Though mobile phones are owned by more than 40% of the women, most of them are not in a position to tell their mobile phone number. As most of them are illiterate, they don't access any farm magazines or newspapers. PILUPU, an NGO promoting non-pesticidal management (NPM) has been working in the area and so the women are well exposed to NPM in paddy. Most women have television at home, which they use only for entertainment. None reported having radio at home. Internet and internet kiosks are not known to 85% of the women who participated in the discussion. Three women knew about it as their children studying in the colleges

have talked about it. They access some information about inputs from the dealers in the mandal HQ. They are keen to have the inputs available in their own village and they are not looking for any new information.

3. Ballabgarh Tehsil of Faridabad district (Haryana) Women from the gram panchayat *Junera* participated in the discussion. In this village, women are involved mostly in tending to their own agricultural field and the main crops are maize, paddy and vegetables. Almost all families are engaged in dairying, mainly buffalo rearing. About 70% of the younger women are literate. Almost every household in the village has 1-2 mobile phone connections and about 90% have television sets in their houses. Couple of houses in the village can even boast of computer and internet connections and landline phones. Few have radio sets and fewer still who listen to them. Most of the women watch television for entertainment and only a few listen to any kind of news or information from television. They have never used telephone/mobile for accessing any information to improve their livelihoods. Only a couple of women respondents read newspapers. A few younger women wanted to explore opportunities for working from home and thereby add to the household income. A couple of young girls from the families those were solely dependent on milk for their main source of income were interested to find out more information on best practices to feed cattle, increase milk yield, how to avoid spurious inputs in the market, reduce input costs and to make dairy more profitable. However they did not have much idea from where they could avail this information, other than the local input dealers and fellow dairy keepers as the village.

4. Dhampur Tehsil of Bijnore district (Western Uttar Pradesh) Women from the village *Dhakaul* were contacted for the group discussion. The main crops in this village are sugarcane, wheat and paddy. Almost all households keep buffaloes and milk is an important source of income for all families. Almost all livestock activities are managed by women. There is a Mahila dairy society linked up with “Mother Dairy” in this region. 10% of women in the village go for labour work on the agricultural fields of others or in brick kilns or NREGA works. The literacy among the older generation is poor, but most of the young women are literate. Almost every household has 1-2 mobile phone connections. Out of the 400 households in this village, only about 60 have television. Three women, reported about watching programmes like Krishi darshan and getting different sets of information from them, but they couldn’t articulate clearly how they have used that information. A couple of houses have computers, but with no internet connection. A few women expressed their desire to receive valuable information on child care/reproductive health via some medium. The poor women belonging to the backward classes are keen to know about the government schemes and they expressed their difficulties in getting the BPL cards made. Many other poor women were not able to articulate which information they need.

A few set of common characteristics are observed in these four group discussions. These are as follows:

- a. Information needs of rural women vary widely. Even in a single location (village or a group of neighbouring village) there is a wide diversity in the types of information, women are interested in. Differences in literacy, economic status (poverty) and occupation determine the kinds of information women are interested in.
- b. Women who are keen to know more about better animal husbandry practices do not know from where they can obtain the right information.
- c. Women are keen to have information on child care and reproductive health

- d. Many women have difficulty in articulating what information they need
- e. Only few women in the sample watch/listen to agricultural programmes telecasted/broadcasted through Television/Radio. Television is mostly considered as a medium for entertainment
- f. Mobile phones are used mainly to be in touch with family members and only few have used it to seek information related to agriculture

What is clear from the above group discussions is that, initiatives that use ICTs for reaching rural women should better understand the current ICT use pattern and also the varied information needs of rural communities. Women have difficulties in either articulating exactly the nature of information they require or sharing this requirement with outsiders, using some of the women in the same village/locality (with whom they have confidence), for collecting this information would be ideal. Perhaps there is a need for repeated interactions to design a better approach to use of ICTs for women empowerment.

4.2.7 ICTs and women empowerment?

Women empowerment emphasizes the importance of increasing their power and taking control over decisions and issues that shape their lives. Broadly there are three types of empowerment, economic, social and political. Are ICTs contributing to women's empowerment in India?

The substantial literature available on ICT for Rural Livelihoods (ICT4RL) projects reveal that targeted applications can aid in increasing and/or protecting the livelihood assets of the poor by mitigating their vulnerabilities (de Sliva, 2008). As many of these evidences are anecdotal, there is an enormous need for research to fully understand the developmental and empowerment implications of ICTs. It seems there is a supply push (e.g., portals, kiosks) on using all kinds of ICT tools to disseminate whatever information each organization had and there are only few initiatives that respond to demand-pull (knowledge centres, call centres).

What is the evidence from the cases we have discussed in this paper? Table 2 provides an analysis of different ICT applications with respect to empowerment of women.

Table 2: ICTs and Rural women empowerment

	Contribution to rural women empowerment	Strengths	Limitations
Radio	Improved knowledge on agriculture, health, nutrition, childcare and subjects learnt through distance education for increasing productivity, achieving better health and nutrition and acquiring better employment	<ul style="list-style-type: none"> • The most important medium for information dissemination in India (widely available and accessed in rural areas) • New formats providing interactivity (phone-in-programmes) • Can listen while doing work • Very useful in generating demand for new information and technology • Support distance education 	<ul style="list-style-type: none"> • Mostly generic information • Generally treat listeners as passive receivers of information. • Rural women need access to other sources of support and services to effectively use this information
TV	Improved knowledge on agriculture, health, nutrition, childcare and subjects learnt through distance education for increasing productivity, achieving better health and nutrition and acquiring better employment	<ul style="list-style-type: none"> • More effective and better retention of disseminated information due to visual appeal • New formats providing interactivity (phone-in-programmes) • Very useful in generating demand for new information and technology • Support distance education 	<ul style="list-style-type: none"> • Mostly generic information • Rural women need access to other sources of support and services to effectively use this information • Predominantly treated as a medium for entertainment
Print media	Disseminates a wide range of potentially useful information on agriculture, health, nutrition, employment, environment	<ul style="list-style-type: none"> • The information from the print media can be easily stored and retrieved at home 	<ul style="list-style-type: none"> • Low levels of rural female literacy and so is accessed mainly by literate women and knowledge workers working with rural women

Internet enabled computer centres	<p>Dissemination of information on agriculture, health etc(online and offline content)</p> <p>Training in computer skills</p> <p>In few cases, as a forum for interactive learning and social empowerment</p>	<ul style="list-style-type: none"> • Provide a wide range of information (farm technology, weather and prices, health and nutrition, government schemes etc • Enable rural women to access computer skills • When organized as part of a women's collective, it contributes to social empowerment 	<ul style="list-style-type: none"> • Most of the information available in the net is in English and is very generic • Need human intermediation for generating locally relevant content and supporting women in access the information • Effectiveness depends on quality of the intermediary • With increasing emphasis on financial sustainability, the focus is shifting towards revenue generating services • Women have less disposable income to pay for information
Portals	<p>Knowledge and information gain by ways of accessing by range of useful information relevant for women (agriculture, health etc)</p> <p>Increasingly e-commerce and online question and answer service</p>	<ul style="list-style-type: none"> • Very useful for knowledge workers involved in rural development and rural women empowerment 	<ul style="list-style-type: none"> • Mostly generic information and in English (Portals in vernacular languages are limited, but are increasingly available). • Portals vary widely in their user friendliness. Considering the low rural female literacy levels, human intermediation critical for rural women to make fuller use of this information • Rural communities need access to other sources of support and services to effectively use this information

Call Centres	<p>Information and advisory support especially on agriculture and health</p> <p>Increasingly distress help-lines for women</p>	<ul style="list-style-type: none"> Recent years have witnessed increasing use of this facility mainly due to increasing rural telephone density and wide publicity of these services. Information and advisory support to callers by experts 	<ul style="list-style-type: none"> The quality of information and advice provided through agricultural call centres, is poor as the calls are mostly dealt by those with limited field experience (often fresh graduates) Women callers are less than 15 % in agricultural call centres in most of the states. The proportion is almost the same in the case of health.
Mobile	<p>Quick access to timely and relevant information as voice or text by a large number of subscribers.</p>	<ul style="list-style-type: none"> Very useful for disseminating dynamic and locally generated information on weather, prices, crop tips, government schemes. Increasingly being adopted by mobile companies as a value added service to mobiles on a subscription basis (as a commercial business venture) 	<ul style="list-style-type: none"> To make use of the value added information, communities need access to a wide range of support and services and therefore only the relatively better off farmers are able to use the information, especially information related to market prices (own transport and storage facility), weather (labour availability) etc. Little evidence of women subscribing to the value added services
Community Radio	<p>Generate and disseminate locally relevant information with community participation</p> <p>Contribution to development of rural women networks in few cases leading to social empowerment</p>	<ul style="list-style-type: none"> Wide range of information on rural life disseminated. Content defined by rural communities especially if the station is under community control and management Better reception as local dialect is used for communication Potentially useful for raising awareness and also for advocacy communication at the local level 	<ul style="list-style-type: none"> Community ownership and therefore community participation in generating content is limited in most the community radio stations. High cost of setting up CRs and the excessive regulation currently constrain many CBO from setting up CRs.

Video	<p>Better information and knowledge gain through using videos as part of training rural communities</p> <p>Creative use of video has contributed to social and political empowerment in few cases</p> <p>Also as source of employment</p>	<ul style="list-style-type: none"> • Can potentially support training communities in good farming practices • Potentially useful for raising awareness on issues of women's concern and mobilizing women around common issues 	<ul style="list-style-type: none"> • The success would depend on the quality of intermediation required while screening the videos as well as its use in training programmes • The usefulness is also dependent on the relevance of the content and therefore the need to develop content locally.
Digital photography	<p>Better knowledge on managing crops through expert advice on crop protection/management</p>	<ul style="list-style-type: none"> • Reduced time lag in identification of a problem and availability of expert advice 	<ul style="list-style-type: none"> • While better off farmers with mobile cameras and access to internet can better make use of this information, the rest would need the help of a service provider to take pictures, mail it and obtain advice. • No mechanism to ensure that the recommended inputs for taking corrective measure are available with the input dealers • Little evidence of women accessing this service

ICT- based enterprises	Economic empowerment as new source of rural employment	<ul style="list-style-type: none"> • New source of employment in rural areas for providing several web-enabled services, training rural communities in computer skills and as employees in rural BPOs 	<ul style="list-style-type: none"> • Can only be used by women with at least secondary education • Need reliable hand holding support (technical, managerial and financial) during the establishment stage
ICTs in support of existing enterprises	Economic empowerment by way of accessing new markets, increase in efficiency, and access to new production knowledge	<ul style="list-style-type: none"> • Several opportunities exists to improve the efficiency of rural women enterprises 	<ul style="list-style-type: none"> • Need organizations and programmes that can provide this support.

Table 2 reveals that most of the ICT applications are disseminating new knowledge and information to rural communities including women. However many women don't have the required support (human networks and financial support) and access to complementary set of knowledge and services to make use of this information. New information is necessary but not sufficient to bring about women empowerment. It is also interesting to note that those women who are part of other women focused initiatives were able to make use of the power of ICTs better. Wherever, women are part of initiatives that are empowering rural women, they are able to benefit from these tools better.

Rural women are increasingly gaining in terms of employment in ICT-based enterprises. There is also clear evidence on women gaining by use of ICTs in their enterprises. ICTs do contribute to women empowerment, though its contributions vary significantly based on the tool used, for what purpose it is applied and by which agency. There is evidence, though limited, to reasonably conclude that ICTs have the potential to contribute towards economic, social and political empowerment of women.

Economic empowerment In the case of SEWA, application of ICTs especially use of computers and internet based communication and marketing applications have contributed to enhancing the efficiency of the enterprises (reduction in wastage, better planning of production inputs and use of external high value markets) thereby contributing to the profitability of the enterprise and better income for women. Application of ICTs in dairy co-operative societies has resulted in transparency in milk procurement, pricing, less waiting time and quick payment for milk and needless to say women manage the dairy enterprise in Gujarat and traditionally women control/manage the income from dairying. Women have benefited financially through ICT-based enterprises promoted by Kudumbasree and from Rural BPO operations such as Desi Crew and HarVa. More women are also becoming entrepreneurs setting up and managing the CSCs (e.g., Srei Sahaj).

Social empowerment The village knowledge centres of MSSRF is a good example of an ICT initiative that is providing an opportunity or space for rural women to communicate with other women who are seeking similar relevant information and need similar kinds of trainings. Knowledge Share Centres of I-Kisan/CRIDA and AMS/ICRISAT are also providing such opportunities where ICTs are providing information and opportunities for interaction, thereby addressing the isolation of rural women and contributing to social

empowerments. Listener groups and community media production groups organized under the CR is another case where ICTs are contributing to social empowerment.

Political empowerment ICTs are contributing to political empowerment, in areas where it has been applied as agents of change. Video Sewa is one such case, where videos are used to bring attention of the public and the community on the need for change and action. DDS has also been using the video and the radio to bring about attitudinal and operational changes to the kinds of crops grown and technologies to be adopted. Women who are part of the CR in Uttarakhand felt that after giving several interviews on the radio, their confidence has also been boosted as they had never been given any opportunities to make their opinions known in public places. They were initially scared to even utter a single word in front of a mike.

Issues of women, gender and ICTs is very complex and the research is thin (Melhem and Tandon, 2009). Inadequacy of research data on satisfaction of customers on how their demand for information has been met through these initiatives and how they have used the information to improve their livelihoods currently constrain making bold and decisive statements on ICTs current contributions to women's empowerment.

5. CONCLUSIONS

Most of the ICTs are disseminating new information and knowledge on agriculture, health and nutrition among rural women. However, due to the continuing digital divide between urban and rural areas and also between men and women, many rural women are yet to fully benefit from the potential of ICTs.

While new information and knowledge is necessary, it is not sufficient to bring about women empowerment. To make use of the information, women would need access to other sources of support and services. Women who are part of other development initiatives or groups and those who have access to other sources of service and support were able to better use the information and knowledge disseminated through ICTs.

The potential of ICT tools varied widely in reaching rural women. There is no ideal ICT that fits all situations. Among the varied tools, the knowledge centres and the community radio were found to have the greatest potential in reaching women with locally relevant content. In both cases, there is an explicit intention to target rural women.

Radio and television would still remain critical for disseminating a wide range of information to rural communities in India in the years to come. Increasing interactivity and more imaginative programming through interfacing with communities and listeners/viewer clubs/groups would enhance its contribution significantly. Radio and television also support distance education programmes to a very large extent.

There is a lot of potential for ICTs to create new employment opportunities for women in rural areas. Rural women however need financial, technical and managerial support to effectively utilize this opportunity. ICTs can also contribute significant gains in efficiency and effectiveness in rural women enterprises.

From the cases reviewed, it is clear that it is not the ICT per se, but the vision of the organization applying the ICT and its working relationship with rural communities that is contributing to women's access and use of ICTs.

If women have to benefit from application of ICTs, special focus needs to be given in its application, otherwise like any other development interventions, women get sidelined. Enacting and enforcing gender-sensitive ICT policies makes lot of sense.

Efforts are also needed to bridge the different types of digital divide (rural-urban; men-women) currently witnessed in India. Apart from strengthening infrastructure (electricity, connectivity, common access points), there is a need to invest resources in generating locally relevant content in local language and dialects, through employing participatory content generation methods.

More efforts are also needed for enhancing the capacities of rural communities, especially rural women to access ICTs. Human intermediation is critical and the success of ICTs in empowering rural women would essentially depend on the quality of human intermediation.

Most of the available evidence on ICTs and women empowerment is anecdotal. To fully understand the developmental and empowerment implications of ICTs, further research is required.

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