263. Understanding Snake-bites and Soil Salinity–Science Communication over "New Media"

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Abstract. The Understanding of and application of scientific principles holds the key to technological progress and developmental goals of any nation. Rural India is characterized by poverty, illiteracy, infrastructural inadequacies and the myriads of ills that plague those below the poverty line in the third world stemming largely from the lack of scientific awareness, and spread of community knowledge.

Over the past decade information and communication technology (ICTs), specially new media like the Internet has brought information access far closer to the rural populace. Information Kiosks have been set and cellphone coverage has scaled rapidly.

These new forms of media provide unforeseen opportunity in spreading scientific awareness that can help overcome superstition, improve health care and even provide access to income. However technology options are not sufficient by themselves. Public communication for dissemination of scientific knowledge needs to be participative in nature and focus on the needs and benefits of the community itself. Implementation of such projects needs to take a holistic view that encompasses a multi-disciplinary approach towards the problem.

This paper presents some experiences as well an approach and a plan for a large scale intervention of scientific knowledge with community participation that can be successfully implemented utilising the existing investments in basic infrastructure. This is largely drawn on our previous experience in working with the rural community and building a successful effort of capacity-building and livelihood generation for the rural community in Sunderbans.

Keywords: Capacity-building, Community, ICT4D, Information technology, New media, Poverty, Rural knowledge centers, Science communication, Village information networks

Introduction

The past few decades have been marked as much by technological progress as its inability to address or even impact the issue of poverty eradication. In most developing economies, the Human Development index (HDI) is fairly low even in the face of rapid economic growth. In India–a country that can take pride in its technological advances and its growing economy–the HDI ranking is at 128 for 2010 and 134 for 2009, among 182 nations.[1] The Multi Dimensional Poverty Index (MPI) developed jointly by UNDP and Oxford recently show many states in India with poverty levels lower than many areas of sub-Saharan Africa.[2]

The demographics of the citizens of India based on the census of 2001 shows that 72.18% reside in the villages while 27.82% live in Urban areas and only 13.20% of these are in cities of population 500,000 or above.[3] This large percentage of citizens survive on an income below the poverty line of $1 a day and have a very low literacy level, and their exposure to Information and Communication Technology (ICTs) are almost nil.

The disparities in income are wide between the educated urban elite and the impoverished rural people for whom even earning the bare minimum is daily challenge. Lack of basic scientific knowledge on health and hygiene makes much of the population prone to disease and vulnerable to exploitation. This trend is not isolated but manifests itself in other developing economies as well.

New Media–Opportunities

So what impact can technology really have in overcoming the problems we face in public dissemination of scientific knowledge?–the topic of this particular conference and the deliberations of the past few days.

From the 1980s India has extensively used the national television channel for broadcasting scientific information to the people. Through a programme under the University Grants Commission, educational and scientific programmes are prepared at universities by students of mass communication and televised. But television content, which does not allow interactivity, still remains as a traditional form of media.

What is new media?

The question is what exactly do we mean by "New Media"? It is a common perception that any form of electronic content, broadcast TV, radio, electronic music played on computers or static pages on the Internet classifies as under this category. But digitisation alone does not define new media.

New Media technologies are better defined as those which allow the user full interactivity, in deciding the access to the content, and perhaps even the form of information, like text, language, video or audio. New Media thus allows "on-demand" access to content keeping the users in control of what choices they make. This option for interactivity is enabled by the technology of to-day whether it be the Internet through computer terminals or access to TV channels over a mobile device or even an IVRS information retrieval system.

We all know how advent of Internet and communication technology has changed the world we live in to-day. Instant delivery of information that you need from anywhere in the world is possible in a matter of minutes, even seconds. Scientific and technological research can now be shared seamlessly across geographical boundaries. It is said that Internet is not just a new Media – it is a new way of life!

Bridging the "digital divide"

But till recently all of this was the prerogative of only the rich educated elite in India and this led to the coinage of the term "Digital Divide".

The Indian Government was guided by the Millenium Development Goals set up by the United Nations to create a world free of poverty by 2015, which declared a commitment to "make available the benefits of new technologies especially information and communication technologies (ICTs)"[4]. Subsequently a number of initiatives have been taken by the government of India to extend the reach of these technologies into rural populace and cross this so-called divide.

Mission 2007 was initiated to provide access to information to the 600,000 villages in rural India. About 100,000 "Information Kiosks" called Common Service centers (CSCs) have been set up in 1 in 6 of these villages in a Public-Private-Partnership model. These have been linked to the State Wide Area Network and are operated by Village Level entrepreneurs.[5,6] While primarily meant for delivery of government services there is an unlimited opportunity to access this ready infrastructure for the purpose of interchange of scientific and technological knowledge with the rural communities.

The Indian government simultaneously focused on increasing rural connectivity both through Cellular bandwidth expansions. Cell users in urban areas are taxed by the federal government to help build a corpus fund called "Universal Services Obligation Fund" [7,8] which is then invested in infrastructure for cellular coverage in rural areas. In recent years the growth of cellphone usage in rural areas, with the simplicity of voice communication that can be used even by those challenged by technology or education, has overtaken the revenues generated in urban areas!

This infrastructural backbone can then provide a robust and effective platform to meet the objectives laid out under Public Communication of Science and Technology – namely "the ability to respond to technical issues and problems that pervade our daily lives and an appreciation of the way science works and how the community can interact with science to help shape its work".

From the technology perspective it appears to be an ideal scenario and it is tempting to suggest an all pervasive solution where scientific information is provided as content; and we wait and expect that the community will benefit. This is no more than the using new media in the same broadcast mode of the earlier technology like radio or television. While dealing with rural community it is extremely important to understand the impact of these tools and to effectively utilize them; and to illustrate this we share some of our experiences from our previous experiences in working in the areas of Sunderbans, part of the Gangetic delta in West Bengal.

The Rural Perspective–(Sunderbans)

"Sunderbans" part of the Gangetic delta basin –the world's largest delta, is also one of the poorest sections of the world. Sunderbans is a World Heritage site of UNESCO, which straddles the countries of India and Bangladesh. The Indian part is home to about 5.4 million people a very high population density for a rural area.

The Sunderbans have no cities, just scattered villages and islands where there are settlements and protected forests.

Travel between the islands is mainly by boat. The community traditionally has agricultural and fishing livelihoods. But the produce–fish, timber, agricultural produce, honey is shipped to the urban areas for further processing. There are no industries and the per capita income of the inhabitants is largely unknown; the reported figures show 37% living below the poverty line quoted at the figure of $1/day, but in reality the percentage is far higher.

Figure 1. Travelling in the Sunderbans

The area is disaster-prone and often ravaged by cyclones. The largely fishermen community also remain at risk, due to lack of effective disaster warning systems.

The youth of the region often do not complete their formal education as they cannot attend schools regularly due to long sailing trips on fishing trawlers where they work as hired labor as sole bread-winners in their family. Those who do have the means to get an education – there are schools and even many government run "colleges"–are excluded of the livelihood opportunities due to lack of skills and capacity for the workplace. The rural youth migrate to the urban areas but with no exposure to computers, considered a basic tool at the workplace of to-day, they would find themselves excluded.

Our organization, in partnership with another philanthropic agency, Anudip Foundation ran the ICT-based Skills training project for rural youth, in this region, leading to livelihood options. Many of the youth trained by us have been operating the Information Kiosks under the CSC scheme in this region. [10]

Figure 2. Rural Internet Centre

Community Needs and Relevance of Scientific Knowledge

In June 2009, the cyclone Aila hit West Bengal and many areas of this region in the Sunderbans was affected by flooding and isolated from the mainland. Relief efforts included food and medicine supply but for many of the people who were homeless, without any shelter the problems of health care were critical. For many of these people the critical need for "scientific knowledge" at this juncture were precautions on how to avoid infection and what measures to take. Sometimes even age-old remedies were shared across villages, especially where infrastructure made it hard to reach medicines. Simple precautions like boiling water, or even regularly washing hands and lessons in hygiene had to be shared across the community.

Post cyclone one of the major hazards that emerged was the proliferation of snakes due to the flooding of ground and old buildings. A local Community Based Organisation (CBO), Aikatan, developed a set of posters that could be used by the villagers to quickly identify the poisonous variety of snakes. It is well known that in case of snake bites, many deaths are more due to shock and fear. Confidence to identify the poisonous variety of snakes and basic first-aid techniques go a long way in being prepared and are welcomed by community. Groups of youth toured many

villages in the area with these posters.

During the cyclone another problem that arose was the breaching of many of the embankments near the villages. This meant that the saline water creeped into the agricultural lands and made cultivation impossible. For the rural poor whose only livelihood option was the farming produce–there was little choice left to them but for migration to the city in search of work they were ill-qualified for.

What scientific options could have been made available for quick desalination of the soil? What crops could be grown in this saline soil? These were the scientific questions that needed answers–the relevance of the problem and quick solutions needed would make the interactive approach of the new media the most suited for cases like these–and perhaps this would lead to the means for poverty eradication.

Holistic Approach

These experiences shared by the community during and after the cyclone Aila clearly brought to focus the need for the relevant scientific knowledge, as applicable to the situation. Information needs of the rural Community are quite different from the urban populace, and many of us as "outsiders" do not perceive this while disseminating scientific knowledge. The need for the community members to identify the requirements for knowledge areas must be clearly the focus.

Development practitioners have widely accepted that community interventions need to be participative in nature as no external effort can be sustainable. Tools like PRA have now become the standards for any development initiative to ensure that there is a complete community buy-in, and the community itself is a stakeholder, otherwise any development goal is unlikely to be met.[9]

For the dissemination of scientific knowledge a similar approach needs to be followed. Community members as stakeholders need to identify the critical areas of knowledge. Perhaps the same Participatory tools which are used in the social sciences can be used here, with a few community members being assigned pivotal roles. Thus to effectively disseminate knowledge we need to take a multi-disciplinary holistic approach encompassing social science, technology and the basics of scientific principles. Not only that the exchange must be a two-way process. Traditional knowledge sometimes residing in the rural communities must also be captured and shared and it is exactly this type of processes that can be effectively supported by the new media technologies that are available to-day.

An Implementation

The network of Rural Information Kiosks available today provides the best opportunity to implement this knowledge sharing. The village level entrepreneurs who operate these kiosks enjoy the confidence of the community and are well aware of the problems that they face. In fact much of the problems illustrated by us have been shared through their experiences.

What is really needed is the option to be able to upload and share problems that need technological or scientific solutions. These need to be addressed quickly and effectively and answers need to be given by people who have both the scientific know-how as well as experience of working in the community so that the solution has relevance.

Our proposal is to build a rural knowledge portal in local language that can help add to the knowledge base. The technical solution would have the following:

1. A web Portal where the community can upload their questions and problems.
2. A facility where they can also upload and share solutions, or knowledge (as in the case of the snake-bite awareness programme).
3. An Interactive Voice Response system that allows for community members to call-in and check for simple problems
4. A Help-line where community members can actually speak to a person who would provide answers (this may even be the Information Kiosk operator who can tap the local knowledge base).

With this simple set of technology infrastructure it may be possible for us to extend the reach of scientific knowledge to millions and provide them with an option for improving their livelihoods. It appears such a simplistic solution, we wonder why this has not been done, and if it has, why it has not worked in the spread of scientific knowledge?

The reason is that technology alone can not be considered as a solution – it is the community that needs to take the ownership and there are several barriers that need to be overcome for this to be an effective method to meet our goals. Technology cannot be the driver for communication, it needs to be the slave.

Key success factors

So what are the key success factors that can help us use this technology to meet the goals of objectives that PCST 2010 has laid out? The PPPO model which takes into account not just the technological backbone but the people, process, participation and ownership is perhaps the most effective means to achieve this.

People: The most critical aspect of using any technology is the need to understand it and control it. Empowerment comes when people feel that they are in control of the systems that they are using. Fear of technology inherent in people and more so in the traditionally rural background this continues to remain a barrier. It is therefore necessary to overcome this critical area first.

Technology challenges can be conquered only when people learn to use it. The ideal solution for this is simple usage methods, and graphical user interfaces, perhaps even technology like touch screen that can be easily learnt by the rural community in the villages.

The key to the successful implementation of this project then lies in capacity building for the community or even the kiosk operators/village level entrepreneurs who by nature are trusted as they belong to the community itself.

Process: The next barrier is in the process of disseminating or even collecting scientific knowledge. The scientific body of knowledge needs to be formulated and this is an area where the easy uploading of content in the form of sharing experiences, can be extremely effective. Traditional knowledge sharing needs to be encouraged. It is better than the earlier "broadcast" modes of only the experts being expected to upload the knowledge.

For community members, perhaps a remunerative model where those who upload content can be paid nominal amounts may work as an incentive to gather the real knowledge base residing in our rural communities. This would also add a livelihood and income option to the poor communities and encourage use of the large number information kiosks and internet centers that have been already set up.

Participation: Equally critical is the relevance and access of the scientific principles itself. If answers to questions are available at the time of need, that is when the public communication of scientific knowledge will be useful. Rural communities do not have the time or luxury to use technology as an entertainment tool, for them it must be a utility, accessible when needed for helping them in their struggle for daily living.

Ownership: And finally the community needs to feel the ownership of the knowledge base and the technology available through their local access means. The oft-quoted words of Abraham Lincoln's Gettysburg address for government "of the people, for the people, by the people" [11] needs to extend to scientific knowledge for the grassroots community and only then can we achieve our desired goals.

Conclusion

While this paper outlines the use of new Media in public Communication of Science and technology, our role has primarily been in capacity building among the rural communities. We are also part of the Rural Knowledge Network (Grameen Gyan Abhijan) in India which strives to promote this free flow of information between diverse rural communities in India.

Our future plans include more stress on developing content in this area of scientific knowledge, both from expert knowledge sources as well as from the rural community. We also hope to extend our model to use not just Internet and computer based access, but also cellular and voice communications which can even overcome the barriers of language and literacy.

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