

POLICY FOR INTEGRATION OF ICT INITIATIVES ACROSS RURAL KARNATAKA

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Implementing Organization

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1. SYNTHESIS

ICTs are being recognized as an essential form of infrastructure necessary to the process of development since they represent an unprecedented opportunity to make new knowledge, services and opportunities available in underserved areas. Over the past few years Karnataka has emerged as a frontrunner in the IT domain in India. Not only are its cities and towns a preferred location for multi-national and national IT companies, information and communication technology is reaching its villages through a number of projects initiated by the government and private bodies. Unfortunately the implementation of these ICT initiatives is haphazard because each government department or private organization is focusing on its individual mandate, in isolation of one another. Karnataka might take justifiable pride in being a leader in the IT sector but these rapid advances have not really helped the rural population to the expected level. The essence of development requires establishing linkages between different initiatives to maximize effectiveness and benefits from the providers' and users' point of view.

The project aims to propose systems that will give the rural population of Karnataka ICT based multi-sectoral advantages and initiate the growth of private entrepreneurship models that would eventually make the ICT schemes viable and sustainable. Towards this, the researchers are in the process of examining the existing infrastructure, applications, information and manpower resources provided by governmental authorities, non-profit organizations and corporate concerns. Detailed discussions are being held with each of these stakeholders and others who plan to foray into providing ICT based services in the future. Talks with some private franchisees of specific ICT initiatives have given the service providers' point of view. The researchers still have to map the needs of the villagers vis-à-vis the services that are being provided. This will be done by conducting surveys in two villages where some ICT initiatives are operational.

Based on the survey conducted so far, the preliminary research findings are that across the wide range of ICT initiatives that cover sectors of health, education, public administration, produce pricing and marketing;

- Most initiatives are planned with a pilot based approach. All the service providers have individually put in significant amount of time, capital and efforts to get their pilot projects operational and successful to a fair extent. In most cases the funding and subsidy route has been used to make the model a success.
- Each is a stand-alone initiative and there is no cross-sectoral initiative that is being offered by a single service provider. There is no integration within a sector and across sectors.
- Every service provider has complained of the power situation in the state being a major bottleneck to ICT initiatives. Even though many of them have addressed this issue in the pilot projects through power supply equipments such as UPSs (Uninterrupted Power Supply) and Diesel Generator sets, but these can provide electricity for a few hours which has been adequate for the use of individual applications but will not be adequate if a combination of services were to be provided. Added to this, there are problems of availability and storage of diesel for DG sets in rural areas. Although few of them thought about installing renewable energy devices, but the high capital investments prohibited them going for it.

- Initiatives that have been implemented or expanded by the local government have seen a certain degree of replication but again very limited and confined to pilot stage only. Individually none of these initiatives are economically sustainable through private enterprise on a large scale.
- Connectivity is of importance when applications involve the use of internet, especially in the fast-mushrooming information kiosks. The connectivity available across rural Karnataka may not be very reliable, but efforts are on to provide the same, using a variety of technologies. In some cases more expensive home-grown connectivity solutions are being implemented to promote indigenous enterprise, but the trade-off in cost needs to be studied carefully, especially since we are looking at the rural market where the paying capacity is limited.
- Some of the real time database driven services that are currently being offered would be more beneficial if they were message based and communicated to an identified person in each village.
- Though each service provider understands the relevance of collaborating with others, concern over the dilution of their distinct mandate has resulted in a lot of talk but no action on coming together.
- Lack of apex body that is analysing the needs of the community vis-à-vis what is being offered by the service providers.

2. RESEARCH PROBLEM

In the long term, rural ICT projects could prove to be the most effective means of driving change in these areas: socially, by ensuring equal access for underprivileged groups; economically, by creating new kinds of work and financial transactions; and politically, by improving the quality speed, and sensitivity of the state apparatus to the needs of local citizen consumers. Despite Karnataka leading India's IT drive, the many ICT initiatives implemented in the rural parts of the state have not brought about any radical change in service delivery to this section of society.

Currently rural Karnataka's ICT scenario is dotted with a large number of independent pilot projects, with each model based on subsidy schemes. All pilot project proposals talk of easy replication and sustainability but the state has not seen any large-scale replication of 'successful' pilot initiatives. Subsidies have historically never lead to sustainable models and in many cases have quashed the maturation of a technology into a market-driven mode. Plans for any rural ICT initiative should primarily look at the economic viability of the initiative, since replicability and sustenance are guaranteed only if it can generate adequate revenues. Given the restricted paying capacity of the rural community and the low population density with reference to urban areas, this is a challenge.

This challenge could be overcome if multiple service providers and enablers come together and collectively adapt their service delivery mechanisms to create a profitable model, giving the rural community a combination of ICT based services. This combination of services should have a regional orientation and should benefit them to an extent that they are willing to pay the stated price. Moreover, the services offered should be dynamic enough to address their changing needs, to ensure long term sustainability and growth. This basket of services that is needed, vis-à-vis what is being provided needs to be studied.

There are currently no systems and policies to facilitate and bring about this much needed integration of ICT initiatives across the state. This project aims to come up with recommendations for the same, in order to benefit the rural community with better service delivery and better access to information, while facilitating individual service providers to viably implement their projects on a large scale.

3. RESEARCH METHODOLOGY

A compilation of the various ICT initiatives across the state was made using resources such as directories on ICT initiatives, newspaper articles, discussions with persons working on rural issues and on ICTs (both in-house and external) and the internet. Apart from the application providers, the list also included organizations that worked in areas linked to ICT penetration in rural areas, such as providers of power and communication links, research laboratories, hardware manufacturers etc. This list was suitably appended during the course of the project and discussions with the various stakeholders.

About thirty six organizations were short listed including fourteen government departments looking after sectors such as power distribution and financing, communication (radio, land-line, cellular and mobile technologies and satellite technology), agriculture and agri-produce marketing, public administration, information technology, education, commercial taxes, health and family welfare and silk trading. The short listed organizations also include six companies involved in the manufacturer of ICT equipment especially for the rural market (including a research lab), four corporate organizations providing ICT services for the rural community, one nationalized bank providing micro-credit services in Karnataka and eleven NGOs working on rural ICT initiatives.

Detailed discussions are being held with senior personnel from the technical / planning departments from the short listed organizations on the nature of the initiative, its objective, geographical coverage, its current status and beneficiary profile, plans for expansion, efforts involved in implementing these initiatives, problems faced and sustainability and replicability of the initiative. All these discussions are being documented. Since the research study is still in progress, some more organizations in the list need to be covered. While the discussions are focussed to gain insights into issues pertinent to the project's objectives of integration of rural ICT initiatives across the state, they cover other related issues such as electricity, comfort level of the rural populace with technology, content design and communication, physical accessibility, etc. that would impact the usage and effectiveness of services offered to the rural public using information and communication technologies.

The project team has also met one private entrepreneur who is working towards providing a basket of services to the rural community residing close to his town by taking up a franchise of a government initiative that has the largest spread in the state.

Annexure I lists the organizations and persons with whom discussions have been held, organizations that are yet to be covered and those whose rural ICT initiatives cease to exist.

A mapping of the ICT initiatives across the state of Karnataka is being done on basis of inputs provided by each organization met during the course of the study. The map would give a visual representation of the rural ICT initiatives spread that would be useful for analysis and the evolution of recommendations.

The project team will also be conducting a survey with the villagers to assess their needs vis-à-vis what is being / going to be offered after all the service provider organizations have been met.

After all stakeholders have been met, policy recommendations and practical methodologies that can be adopted to pool the efforts of the various stakeholders will be evolved. These will be compiled into an Interim report. TERI will then conduct a one or two day workshop to discuss with the stakeholders, the research findings, policy recommendations and proposed methodology for integrating ICT implementation across rural Karnataka. The workshop will be structured to allow for an interactive multi-stakeholder dialogue all through. The policy recommendations and proposed methodology will be examined in detail through stakeholder discussions and suitably enhanced. Further recommendations that come up during the workshop will also be noted. These will later be discussed with the relevant stakeholders and incorporated into the proposed policy framework and guidelines.

4. SURVEY DATA

This section provides a birds eye view of the services provided to the rural community of Karnataka, in the study area for this project, through information and communication technologies. This report is based on discussions with the organizations listed in Annexure I.

4.1 Government Initiatives

4.1.1 Department of Public Administration and Revenue:

Karnataka has 27 districts. Each district consists of smaller administrative units called talukas. Karnataka has 177 talukas, which cover 30,000 villages.

- a. **Initiative and location of its implementation** – The DPAR has initiated the 'Bhoomi' programme in order to provide farmers with easy access to records of Rights, Tenancy and Crops (RTC), a very important document for the farming community. The Bhoomi programme operates through an internet based approach, in contrast to the manual systems which were followed earlier, requiring the farmers to waste a lot of time for procuring the certificate. Under this programme, the DPAR has computerized 20 million land records using Microsoft tools and platforms. Access to the RTC records and changes in land title can now be done on-line through 177 kiosks across the state, one in each taluka. State-of-the-art biometrics authentication processes have been built in to reduce / eliminate password hacking and thereby tampering, manipulation, harassment and exploitation by strongly entrenched vested interests. The location of the 177 kiosks are given in **Annexure II**.
- b. **Infrastructure** – The Department has equipped 177 taluka offices with a kiosk and an internet connection. In recent times, the DPAR is promoting private franchise models for the Bhoomi programme in which the franchisees have to bear the cost of the infrastructure and the internet connection.
- c. **Efforts** – The efforts that went into this project are mammoth – 16 workshops to determine the requirements of the software, 20000 man months of data entry effort spread over 27 cities, 50000 man hours of training to village accountants for managing the system, 200 detailed circulars clarifying all aspects, setting up of a strong grievance redressal mechanism and distribution of 20 million printouts to over 7 million farmers for validation. Apart from this effort, the department had to overcome political and operational impediments and even the Chief Minister of the State was involved in implementing the system. Manual records were declared invalid, strong deterrents were put in place for errant officials and the law was amended to provide for the new system.
- d. **Sustainability** – Villagers requiring the RTC certificate have to pay Rs 15/- per transaction in the taluka office. Not considering the costs for setting up the infrastructure and training manpower, which has been funded by DPAR, the system can sustain the running costs that are currently being incurred at the taluka office in terms of power and connectivity required for the kiosk. It is important to note that the manual system which the kiosks have replaced had 10,000 delivery points serving 30,000 villages. Now with 177 distribution points, a farmer has to travel an average distance of 25kms, which adds a burden of transportation cost and the loss of income for one day. To overcome these difficulties, the department plans to increase the number of kiosks with private franchisee participation to 750 in the first stage. Discussions with a prospective kiosk

operator revealed that the franchise requires an initial investment of Rs 53,000. Operating costs would approximately be Rs 2500/- per month, which includes internet connectivity, space rental, power and manpower cost. At the private kiosks, a charge of Rs 25/- is levied for each RTC transaction, giving Rs 10/- to the kiosk operator. The kiosk operator also stated that the volume of business through Bhoomi alone, is not enough to sustain the kiosk and private franchisees are looking at other services that can be offered to the villagers to generate more revenue. This has been corroborated by the DPAR, which is currently working on enhancing the Bhoomi programme by providing a range of certificates such as birth, death and caste certificates through this system, thereby ensuring economic sustainability of the private franchise kiosks in the long run. Termed as the Rural Digital Service (RDS), the planning phase has taken 9 months and a pilot will shortly be tested at one location in Mandya district of Karnataka.

The department is addressing the issue of sustainability of the private kiosks by looking at services that can be offered by their department alone. Currently there is no move to integrate the DPAR initiatives with initiatives by other organizations or agencies who are providing ICT based services to the rural community.

- e. **Problems** – The chief problem is that of sustainability, which, as discussed earlier is being looked into by expanding the services offered at the kiosk (RDS). Power availability is a major concern and it is currently being addressed by providing a UPS with a four hour battery back-up that is adequate for this application.
- f. **Participation** – Since this was a landmark programme implemented by the Karnataka government, to make it successful manual records were declared invalid and strong deterrents were put in place for errant officials. The law was also amended to provide for the new system and participation by the public was therefore made mandatory.

Bhoomi kiosks have significantly reduced the time that users spend on getting the certificate. A weighted average of the number of visits made for obtaining an RTC works out to 1.33 for the manual system and 1.11 for the Bhoomi kiosks. The users of Bhoomi also benefit from shorter durations spent in queues to get documents. The weighted average time spent in queues in the manual system was 27 minutes as against 21 minutes. Bhoomi kiosk users also had to meet lesser number of officials (weighted average of 1.43) when compared to users of the manual system (3.25). Similar benefits also accrued to Bhoomi users on timely response to complaints (58%) vis a vis users of the manual system (3.6%). A large proportion of Bhoomi users (85%) rated staff behaviour as good while none of the users of the manual system rated staff behaviour as good. [(Report card on service of bhoomi kiosks: An assessment of benefits by the users of computerised land records system of Karnataka by Albert lobo, Suresh Balakrishnan, Public Affairs Centre, Nov 2002]. These factors are aiding to increase the frequency of usage of the service.

- g. **Future Plans** – The DPAR is planning on extending this network to include 750 private franchisees across the state. Simultaneously they are planning for the RDS (explained earlier) and will be shortly conducting a pilot in one district.

4.1.2 Education department:

The Education department has three parallel ICT programmes for government schools, a majority of which are located in the rural areas. Through these

three programmes the Education department is addressing computer aided education in primary schools and computer education and computer aided learning in high schools

a. Initiatives and location of their implementation

- i. The 'Mahiti Sindhu' programme addresses Computer Education for High school (Std VIII, IX and X) students and teachers in 1000 schools of Karnataka, the location of which is given in **Annexure III**. It is a five year programme initiated in 2001.
- ii. In association with the Azim Premji Foundation, a non-profit organization, the Education Department is creating Computer Assisted Learning Centres (CALCs) ¹ in government primary schools across the state. 190 government primary schools in Karnataka have CALCs funded by the Department. In addition to this there are 35 more schools with CALCs, which constitute the pilot CALC project funded and run by Azim Premji Foundation independent of the government. The list of 225 schools with CALCs is as per **Annexure IV**. The computers are essentially used for Computer Aided Education and the Azim Premji Foundation makes a range of multi-lingual CDs to assist the primary school children in grasping their curricular subjects. The Foundation has recently started work on non-curricular themes as well.
- iii. Intel has a worldwide non-profit initiative called 'Innovation in Education' and have tied up with the Education Department to impart training to teachers to innovatively use computer technology to enhance student learning. This teacher-training programme in Computer Aided Learning is currently being conducted in the 1000 schools under the 'Mahiti Sindhu' programme.

b. Infrastructure

- i. Under the Mahiti Sindhu programme 1000 schools have been provided anywhere between six to fifteen computers with a UPS / DG set, a common printer and basic s/w such as the OS and the MS Office suite. The government has intervened to provide a telephone connection in those schools where it was not available, so that the internet can be accessed. A person to impart computer education to the students and the other school teachers has also been appointed for each school, under this programme.
- ii. In the programme for primary schools with the Azim Premji Foundation, each CALC is a room in the primary school where four-five computers with a UPS and a printer are housed. The computers are loaded with basic software and the CALC is manned by a local youth. No internet connection is available in these CALCs.

c. Efforts

- i. The Mahiti Sindhu programme is being implemented for the government by three corporate organizations who are well entrenched in the computer education field, namely NIIT, Aptech and Educomp. The Education Department is absorbing all costs towards infrastructure, maintenance and manpower, incurred by these implementing agencies.

¹ Azim Premji Foundation initiated the concept of the CALC and implemented the pilot in 35 schools independent of the Government. Based on the success of the pilot, the government took on the task of driving this initiative and replicating it across more schools. Azim Premji Foundation continues to play a major role in the implementation of this programme.

- ii. The programme for 190 primary schools is being funded by the department and implemented by Azim Premji Foundation. The Department funds the infrastructure costs. The village community takes care of operating and manpower costs. Azim Premji Foundation bears the cost of developing the CDs and distributing them to all schools under this programme. The first batch of 35 schools where the programme was piloted was funded and implemented by the Azim Premji Foundation.
- iii. Intel is conducting its teacher training programme free of cost and the government bears no expense on this account.

d. Sustainability

- i. The Mahiti Sindhu programme will be supported by the government for five years, of which this is the third year. Sustainance issues beyond government support is being explored by some centres and currently these centres are generating small revenue by offering computer education to the local youth. This revenue is not enough to sustain these centres independent of government support.
- ii. In the case of primary schools, Azim Premji Foundation and the village community are trying to address sustainability issues by charging a nominal fee for usage of the computers by children after school hours and imparting training on computer literacy to local youth. Despite these efforts none of the centres are run sustainably.

In both of the above initiatives the implementing organizations are talking of integration with other service providers but no move has been made in this direction. Individual mandates and the lack of coordination are seen as impediments to this process.

- e. **Problems** – The chief problem is that of sustainability as detailed earlier. The second major problem is the availability of electricity. As in the Bhoomi project, the issue of inadequate electricity supply for the ‘Mahiti Sindhu’ programme has been addressed through provision of a UPS with four hour battery back-up and in some cases a diesel generator. Interactions with some schools indicate that this is adequate for the purpose of giving computer education to the high school students and teachers. At the primary school level, electricity still remains a problem and the Azim Premji Foundation is pilot testing a solar photovoltaic system to power the computers in the CALC. Since the capital cost is very high, they are exploring the possibilities of procuring these systems at an affordable cost. If successful the government might replicate this intervention in all the primary schools where they are participating in this programme.

Internet connectivity was provided through government intervention in all the Mahiti Sindhu schools but the CALCs in the primary schools are yet to be provided with a telephone connection and hence have no access to the internet. There are no plans to provide the same in the near future.

- f. **Participation** - There is a high level of community participation in the CALC initiative, which has been driven by the Azim Premji Foundation.
- g. **Future Plans** – The government plans to extend the Mahiti Sindhu programme to the remaining government schools (~ 2300) in a phased manner depending on availability of funds in the budget.

4.1.3 Department of Agricultural Marketing and Karnataka State Agriculture Marketing Board:

The Department of Agricultural Marketing is playing an important role in helping the farmers secure a higher share in the price paid by the consumer through regulation of market practices for agricultural commodities. It has 145 main markets, each of which has an Agricultural Produce Market Committee (APMC). The locations are given in **Annexure-V**. In these main markets, the government has provided warehousing facilities and also assist in grading the agricultural produce.

- a. **Initiatives and location of their implementation** – The department has created a web page called ‘Krishi Marata Vahini’ where the quantities and prices of agricultural produce traded in the different markets are available on a daily basis. Details of each day’s transactions at each market are communicated to the head office at Bangalore, where they are uploaded at the end of the day. Therefore the data available on this web page is the previous day’s transaction details.
- b. **Infrastructure** - The department has provided 100 of these 145 APMCs with a computer in their office which can be accessed by farmers to see the daily prices of the agricultural commodities. 12 of the remaining 45 APMCs have installed computers in the office with their own resources and in 33 APMCs the farmers do not have access to computers.
- c. **Efforts** – Computer training has been provided to Department officials at Bangalore and at the APMC yards where computers are installed.
- d. **Sustainability** – not considered since the infrastructure is being maintained by the department
- e. **Problems** – While the department has introduced this service to allow the farmers to access the website from anywhere, the farmers cannot access the website easily since they are not adequately trained to use internet based facilities, thereby defeating the purpose of the information service. Electricity is a major problem and most of the APMC yards do not have a power backup system.
- f. **Participation** : Not applicable
- g. **Future Plans:** The Department / Board have no plans of introducing on-line trading in the near future but plan to introduce an interactive voice recording system through which farmers without access to computers can get the market prices of agricultural produce over the telephone.

4.1.4 Central Silk Board:

Karnataka State is one of the largest silk producers in the country and therefore, though the Board is constituted by the Central Government, it is headquartered in Karnataka. It has recently initiated an ICT project in the state.

- a. **Initiative and its location** – The CSB has created a website to communicate cocoon and silk prices at different silk markets across the state, which is updated on a daily basis. The kiosks also offer information on weather, good farming practices and solutions to common problems.

- b. Infrastructure** – Four touch screen based kiosks have been installed in the state, one in the CSB office and one in the office of the Department of Sericulture, both at Bangalore and one each in the cocoon markets of Ramanagaram and Siddlaghatta. Each kiosk is equipped with a four hour battery back-up and required connectivity infrastructure and the initial investment for each kiosk is approximately 4 lakhs.
- c. Efforts** - the Department of Sericulture has placed a representative in each of the cocoon markets for cocoon quality testing. This representative communicates the day's cocoon and silk prices to the head office, where the website is suitably updated.
- d. Sustainability** - Farmers come to the cocoon markets once in a fortnight or once a month but the reelers come everyday. The frequency of usage of this system is therefore not very much. The CSB is looking at options of generating revenues through advertisements from organizations related to the silk industry. Currently the kiosks are not sustainable.
- e. Problems** - As in all other initiatives, sustainability is the major concern, more so in this case since usage is limited.
- f. Participation** – not applicable
- g. Future Plans** - There are fourteen cocoon markets in Karnataka. As mentioned earlier, only two have a kiosk at present and it is planned to equip 12 more markets with kiosks in the next one year. The CSB would also like to commoditize the silk industry and provide online trading of silk goods as in bullion markets. Towards this they are considering grading and standardization of silk related products.

4.2 Non-profit organizations and NGO's Initiatives:

4.2.1 Asia Heart Foundation:

Narayana Hrudayalaya, is a premier cardiac care hospital at Bangalore and has a non-profit sister organization called The Asia Heart Foundation.

- a. Initiative and its location** - The Asia Heart Foundation has set up telemedicine links between their hospital and 23 hospitals across the country. Of these, ten hospitals are in Karnataka and are listed in **Annexure VI**.
- b. Infrastructure** - Telemedicine projects usually call for high initial investments, since most of the telemedicine consulting centres need medical infrastructure upgradation and training of personnel to be able to benefit from the telemedicine linkages. This investment is apart from the capital investment required for the communication infrastructure. Each telemedicine consulting centre has 2 computers, one of which is standby unit. All the centres are also provided with DG set as power back up. Asia Heart Foundation has made investments ranging from Rs 7 lakhs to Rs 50 lakhs at each of the telemedicine consulting centres. Through the initiative of Asia Heart Foundation, 17 hospitals were connected to Narayana Hrudayalaya through ISDN fibre optic lines, following which the Government of Karnataka and the Indian Space Research Organization (ISRO) joined hands with them to extend the network to include 6 more hospitals. ISRO provides VSAT connectivity between the hospitals at bandwidth 2Mbps.

- c. **Efforts** - Apart from setting the requisite infrastructure, The Asia Heart Foundation has also trained 3-4 doctors, 4 nurses, 3 technicians and 2-4 group D staff in each telemedicine consulting centres. In some locations the staff is employed and maintained by them.
- d. **Sustainability** - At present none of the telemedicine activities are self-sustainable, even if we consider only the maintenance costs and not the payback on capital investment. Only one unit has generated revenues of Rs 2.3 lakhs over two years. The other 16 have together generated revenues of Rs 1.9 lakhs over this time frame. Given the nature of service to be provided, electricity and connectivity have to be present for 24 hours. Asia Heart Foundation is exploring ways of using the standby computers for other activities which may generate revenues enough to sustain the initiative. Towards this they are talking to some financial institutions, govt. departments and corporates for integration of services but all these talks are still at preliminary stages.
- e. **Problems** - The chief problem is sustainability.
- f. **Participation** - Not Applicable
- g. **Future Plans** - The Government of Karnataka, ISRO and BSNL (Bharat Sanchar Nigam Limited, which provides telephone and ISDN connections) are taking the telemedicine initiative forward and it is planned to link the 26 district hospitals in Karnataka (excluding Bangalore) to five speciality hospitals at Bangalore and Mysore. The district hospitals or Telemedicine Consulting Centres² will be linked with the server at Narayana Hrudayalaya through VSAT links provided by ISRO. BSNL will provide ISDN fibre optic cable connectivity between Narayana Hrudayalaya and the other speciality hospitals (Telemedicine Speciality Centres³), namely, NIMHANS, St. John's hospital, JSS Hospital and Samatvam. Ten links between Narayana Hrudayalaya and the district hospitals are currently operational and the remaining 16 will be initiated in May 2004. Narayana Hrudayalaya will host the server and store all the data. In the future the government is looking at linking 1000 Primary Health Centres (PHCs) in a telemedicine network.

4.2.2 VOICES:

VOICES is an NGO that looks at using media for social change and has been actively lobbying for Community radio in India.

- a. **Initiative and its location** - VOICES together with MYRADA, another NGO, and UNESCO have initiated 'Namma Dhwani', India's first cable audio initiative, in 1999, in Budikote village, Kolar district, Karnataka. In the absence of legislation that allows for use of airwaves, the Namma Dhwani initiative uses audio cable connections to transmit information to the school and individual homes. The format of the programmes for the school consists of newspaper reading, local news, general knowledge, music, model lessons, and programmes about issues like dowry, environment preservation etc. Programmes for the general public are decided by the community themselves and include entertainment and information on locally relevant matters. More than 350 programmes have been cablecast so far. With the help of the Block Education Officer, school

² A telemedicine consulting centre is the site where the patient is present.

³ A telemedicine speciality centre is a site, where the specialist is present and interacts with the patient who is present at the telemedicine consulting centre

staff and the students now listen to 2 hours of programming on issues relevant to them, every week.

- b. Infrastructure** - During the course of this project Budikote village was equipped with a radio broadcasting station with adequate power back-up. An audio production centre has been set up next to the broadcasting station. In 2002, this centre was equipped with 2 computers. All the 650 households in the village have been cabled to receive the audio programme, 200 of them on their TV sets and the remaining 450 on modified radio sets.
- c. Efforts** - VOICES & MYRADA began work with a needs assessment study, findings of which revealed that the community wanted an information centre, which would give them timely & locally relevant information, through audio, a medium which they were comfortable with. Local volunteers were trained by All India Radio experts and they prepared programmes on topics such as sericulture, organic farming techniques, child and reproductive health, insurance etc. These were initially narrowcast to 60 SHGs in the 35 villages in the Budikote sector and were later expanded to include all the households in the village through a cable network.

Complementing the school audio programme is computer training at the audio production centre. Basic skills in MS-Office are provided by community workers to high school dropouts on the two available computers.

- d. Sustainability** - The study and subsequent implementation of the project, including setting up of the infrastructure, training the people and preparing the first few programmes were funded by UNESCO. Subsequently, the entire activity is being managed by the village residents. VOICES and MYRADA continue to have a presence in the village. For such an initiative to be sustainable and replicable, the audio production centre, transceivers and communication channels need to be reliable and yet inexpensive to build and maintain. There is also a need for a trained manpower to attend to breakdowns if any.
- e. Problems** - The initial cost of setting up the audio production centre is considerable. Maintenance of this centre in terms of electricity cost and breakdown maintenance is also not cheap.
- f. Participation** - The community participates in a very big way in making all the audio programmes for dissemination to the rest of the village.
- g. Future Plans** - Since this is a project implemented by non-profit bodies, with funding available for this single pilot, the involved non-profit organizations do not have any plans for replicating the same until more funds are available. There are plans, however to extend the reach of this project by storing the audio programmes on tapes / cassettes, which can be transported to nearby villages.

4.3 Corporate Initiatives

4.3.1 NDDDB:

A brain child of the National Dairy Development Board, the Safal Fruit and Vegetable Auction Market (SFVAM) is the first of its kind in India. It promises to provide facilities and services for auctioning fruits and vegetables on par

with international standards with an objective of integrating producers and retailers, thereby creating optimal conditions and new trading opportunities. SFVAM is located near Whitefield in Bangalore and was established in Sept-2002.

a. Initiative and its locations - Under the SFVAM initiative, farmers at remote collection centres, currently in the states of Karnataka, Maharashtra and Tamil Nadu, will be able to access real time information on auctions of fruits and vegetables conducted at the Bangalore centre. SFVAM has set up 6 area offices at Kolar, Bangalore rural (Hoskote), Chitradurga and Bijapur in Karnataka and at Coimbatore in TN and Nasik in Maharashtra. It is operating through registered buyers and sellers who will participate in the auction. The registered sellers are members of farmers' associations and SFVAM has set up 100 farmers' associations or collection centres, each with an average membership of 200-300 farmers.

b. Infrastructure - Each association or collection centre is given an office and ten associations have been given computers so far (1 computer per association). A specific application has been designed on Oracle 9i for produce trading, which allows each client to access the intranet on logging in. Communication infrastructure is currently being put up. The existing communication infrastructure is a 60 mts tower at Yeshwantpur of Bangalore and a 26 mts tower at their works in Whitefield, Bangalore, connected by a 11MBPS RF link.

Planned infrastructure – 11 mbps RF links between each of their area offices, linked in series. Smaller bandwidth RF links are planned between the area offices and the collection centres in their vicinity. Other infrastructure that will be put up at the collection centres include computer hardware, communication infrastructure, power and licensed client software.

c. Efforts - During this process, SFVAM is encouraging & providing support for the formation of Farmers' Association (FA) in different parts of the country, starting with Karnataka and Tamil Nadu. Towards this SFVAM is forming Collection Centres (CCs) at appropriate locations, from where the FAs will operate and which would be equipped with facilities to conduct business on real time. The CCs role is to collect and pool farm produce, grade on basis of quality and dispatch to the central hub at Bangalore. Produce quality will be checked again at Bangalore (random sampling) and it will be auctioned. The farmers at the CCs are able to access in real time, the price their produce fetches. The money will be available in their local account after 2 days. SFVAM is in the process of training manpower in each of the CCs on their application.

d. Sustainability - SFVAM has yet to start full scale operations in Karnataka. It is still in the process of establishing computer infrastructure for the project. As this project is envisaged to provide online trading, SFVAM is exploring the possibilities of setting up a dedicated cost effective network so that farmers can have access to the market prices instantly. Currently they are still in the implementation planning phase. Once their operations stabilize, they plan to interact with other ICT service providers to look at integration possibilities, with the idea of better usage of the installed infrastructure and therefore sustainability of the centres.

e. Problems - Not applicable since it is still in the preliminary stages of implementation.

f. **Participation** - Not applicable

g. **Future Plans** - SFVAM is planning to set up more farmers associations and collection centres. 225 associations are planned, of which 150 will be in Karnataka. It is also trying to provide all the necessary agronomic and other information for enhancement of fruit & vegetables produce, through the ICT infrastructure that is installed. It is also planned to provide logistical support to the farmers.

4.3.2 HP Labs:

a. **Initiative and its locations** - HP is working on hardware products and interfaces for the following applications meant for rural people – Adult literacy testing, Open Call Media Platform (OCMP) which is a voice based information service, electronic form filling and script mail (handwriting recognition). Work is in progress to integrate their handwriting recognition application with the electronic form filling application. They also have a portable digital photography solution, wherein a person can carry a camera and printer unit with its power supply in a backpack kit. They look at this being useful in villages where passport size photos are required for various forms and for festive occasions.

b. **Infrastructure** – Most of their products are still in the prototype stage and they have not set up any infrastructure.

c. **Efforts** – HP Labs is carrying out a contextual invention research study where they are doing a region based door-to-door survey on the needs of the people and the economics of interventions. They are looking at the role of imagery in people's lives and the role of computer companies in providing education. They are also doing some research on WLAN (Wireless LAN) technology.

d. **Sustainability** – The one product that is ready for the market is the village photographer kit. The kit costs Rs. 20,000 and a solar power pack with batteries is available for an additional cost of Rs 50,000/-.

e. **Problems** – Though none of the products are in the market, it is expected that issues pertaining to cost and financing mechanisms will have to be addressed.

f. **Participation** – Not applicable

g. **Future Plans** - They intend tying up with various government departments and agencies after their products have been field tested. These agencies include the Dept of Mass Education for adult literacy testing, railways and other e-governance information services for the OCMP and electronic form filling applications. No move has been made in this regard, since the products are not yet ready for the market.

5. RESEARCH FINDINGS

Across this wide range of initiatives that cover sectors of health, education, public administration and produce pricing and marketing, which also make a substantial amount of information accessible to the villagers through information and communication technologies, the major issues that stand out are as follows:

- **Initiative and Location:** Each is a stand-alone initiative and there is no cross-sectoral initiative that is being offered by a single service provider. There is no integration within a sector and across sectors. Most government initiatives have covered all the districts of Karnataka but corporate and NGO run initiatives are currently limited to pilot projects in a limited geographical area.
- **Infrastructure and Efforts:** All the service providers have individually put in substantial time, money and efforts, as is evident in the survey data, to get their pilot projects operational and successful to a fair extent. All the initiatives have installed computer hardware and necessary software for running that application. In some cases, internet connectivity has been provided.

Every service provider has complained of the power situation in the state being a major bottleneck to ICT initiatives. Electricity is barely available for six hours a day in most villages and this too is usually at odd times. Most have addressed this issue through UPSs and diesel generator sets, but these can provide electricity for a few hours which has been adequate for the use of individual applications but will not be adequate if a combination of services were to be provided over a twelve hour period. With the cost of renewable energy devices being prohibitively high and the problems encountered in the availability and storage of diesel to run diesel gensets, implementation of a set of economically viable ICT driven services is severely hindered.

For initiatives that require internet connectivity, the same has been provided by the implementing organizations. The connectivity available across rural India is not very reliable, but efforts are on to enhance the same, using a variety of technologies. In some cases more expensive home-grown connectivity solutions are being implemented to promote indigenous enterprise, but the trade-off in cost needs to be studied carefully, especially since we are looking at the rural market where the paying capacity is limited.

- **Sustainability and replicability:** Most initiatives have been planned with a pilot based approach. In most cases the subsidy route has been used to make the model a success. Initiatives that have been implemented or expanded by the government have seen a certain degree of replication but those with fewer resources have stagnated at the pilot stage. Individually none of these initiatives are economically sustainable through private enterprise on a large scale.
- Though each service provider understands the relevance of collaborating with others, concern over the dilution of their distinct mandate has resulted in a lot of talk but no action on coming together.
- There is no apex body that is analysing the needs of the community vis-à-vis what is being offered by the service providers. There is no single entity that looks at integration issues holistically and coordinates the implementation of the necessary pre-requisites and the various initiatives (in that order) for optimal benefits to all stakeholders. There are independent

committees formed to address singular technical issues such as technical standardization for the implementation of telemedicine networks, but there is no common platform which looks into the individual interests of the service providers with the agenda of holistic rural development.

