Chapter 3 Framework for Planning and Designing of Rural Knowledge Centres

3.1 Introduction

Establishment of Rural Knowledge Centres (RKC)\textsuperscript{5} has been spreading across the globe [100]. RKCs equipped with ICTs have become new ways of reaching people and delivering services in the developing countries [101] [59]. In the process, these centres have been acknowledged as new institutions in the global rural milieu, to empower rural communities by bringing benefits of contemporary ICTs in their reach such as e-governance, telemedicine, digital literacy, and e-agriculture. In the last decade many organizations have launched such initiatives, known as ICT for Development (ICT4D) projects, in the rural areas of developing countries, with an aim to bridge the digital divide by providing access to information and technologies; and also for poverty alleviation, policy advocacy, local governance, and educational development [102]. Today there are tens of thousands of RKCs throughout the world [103]; these are the channels that provide shared public access to information and communication technologies for meeting

\textsuperscript{5} Now onwards the telecentre (more popular until the rural computer centres are classified) is quoted as a Rural Knowledge Centre (RKC) to avoid confusion.
the educational, social, personal, economic, and entertainment needs of the community [104], [105], [59], [106].

As most of these initiatives are relatively new, there are mixed opinions in the literature on their social and economic impacts in the communities where they are situated. For instance, the United Nations Commission on Science and Technology for Development (UNCSTD) reported, that there were many instances where the use of ICTs is bringing widespread social and economic benefits, and also there were as many instances where ICTs made no difference to the lives of people in developing countries (or) even having harmful effects [107]. Furthermore, emerging studies have shown many of the claims being made about the potential of ICTs for development are not supported, and point to possible counter-productive effects [59]. There is also lack of good understanding about a sound conceptual and theoretical framework for planning and designing of RKCs. This study seek s to fill this information gap by assessing the selected RKC project sites in rural India to understand various dimensions and dynamics involved in planning and designing of RKCs and their possible utilization in micro-level drought preparedness.

3.2 Assessment of Projects

Most of the evaluation studies of RKCs till date have focused more on their operational aspects, such as technical, financial, managerial performances and sustainability aspects [104], [108], [109], [110], [111], [112]; and a few discussed possible frameworks and approaches [105], [59], [108], [113]. Some studies reported on the role of RKCs in e-governance applications [114],
There are nil or very few evaluation studies focused on understanding various dimensions and dynamics involved in planning and designing of RKCs and their effective utilization for knowledge management and drought preparedness. In this particular study an attempt has been made to conduct an assessment study by visiting the centres, interviewing the projects personnel, users and non-users and examining the records available at selected RKC project sites – Rural e-seva, Rajiv Internet Villages, MSSRF National Virtual Academy, ITC Aqua Choupal Model and Kisan Call Centres; and understood other selected projects from the literature and interviewing primary researchers and project personnel of the sites – Akshaya, Warana Wired Village, and Kisan Kerala. The case study method was used (discussed in detail in Chapter 2) to understand various dimensions and dynamics of these projects. The primary study was conducted in 2004, and later reviewed again in 2005 and 2006 by collecting information from the secondary literature and revisiting the study locations.

### 3.2.1 Rural E-Seva

Rural E-Seva, a district administrative initiative, was launched with 47 E-Seva centres and eighteen services in January 2003 in West Godavari district of Andhra Pradesh, India. The stated objective is to replace the traditional form of governance and its accompanying inefficiencies with a modern, more open, transparent and responsive service delivery system for empowering citizens.

The funds were mobilized by involving multiple stakeholders, and required software were designed by involving local engineering students and District National Informatics Centre (NIC).
office. The project is an example of how to operationalize an ICT project with available funds and resources. The project indicates the champion’s role is important in this kind of approach to ensure the involvement of multiple stakeholders and resource mobilization from various government departments.

During the study period, it was observed that the services like issuance of land records, online civil supplies allotment, telemedicine, teleagriculture, and consumable management service were not being offered. Services like forms download, access to information, mandi rates, online auctioning and bidding, matrimonial services were not being used much either. The electricity bill payments, Issuance of caste, income and nativity certificates, Filing of complaint and grievances, Applying of government schemes, e-education, and other business services (Xerox, printing, sale of soaps cheaper than market price etc.) were much used by the citizens. It shows the services much used by the citizens were either need based services such as the electricity bill payment, certificates (or) services, which were difficult to avail in the traditional systems such as filing complaints and grievances, applying govt. schemes (or) attraction to the new tools and fun such as e-education through computer in the form of games. The non-availability of content and weak linkages with the agricultural and health organizations were disabling centres to offer telemedicine and teleagriculture services.

Since the district collector was ensuring implementation of filing grievances, and issuance of certificate services, they were appearing as most used services during the study period, otherwise the government officials were not happy to delivery them without bribes which was so common in traditional systems. Hence the study indicates long term sustainability of the services
dependent on the designing of services based on the user needs, support and enthusiasm of
government officials (in the case of egovernance services) or concerned department personnel or
reforms in the traditional systems to overcome this problem.

3.2.2  Rajiv Internet Villages

The stated objective of the Rajiv Internet Village (RIV) is that (1) every citizen in the state
should be able to avail of all Government services/benefits intended for the citizens in a quick,
cost effective and hassle free manner, through a single window (2) transacting with the
government should be hassle free, avoiding middlemen, delays and rooting out corruption (3)
alleviate poverty and illiteracy.

RIV was initially launched as Rural Service Delivery Points (RSDPs) in the year of 2003.
RSDPs were born out of an idea to convert existing STD booths in rural areas into Service
Delivery Points for delivering services such as collection of electricity bills, agriculture
information through iKisan portal, computer education, BSNL telephone connection, access to
government forms, information and certificates, agricultural prices within marketing department
and AGMARKNET, IShakthi information system of HLL, Bharat matrimony services,
examination results and printing of marks sheets, revenue records delivery system and electricity
bill payment which was introduced in the later stages. The centres/operators were identified by
taking certain criteria into consideration, i.e., the operator should pass 10th standard, should be a
local person and own a STD booth in a permanent building. During the study period it was
observed that the electricity bill payment was much used service by the users; and in some places the centres are known as electricity bill payment centres.

After change in the government, the new government wanted to close these centres since it was initiated by the earlier government. However the interest of citizens for electricity bill payment service made them to continue the centres with a change in the name. That’s the way the Rajiv Internet Village were launched in the year 2005 with a revised service list such as easy access to information on agriculture, education, health etc.; market prices, cropping pattern, weather forecast, agricultural extension; quality inputs; seeds; fertilizers, pesticides etc.; agricultural marketing, getting better prices for produce; examination results and elearning; health extension, immunization, telemedicine etc.; Access to all forms, copies of land records, applications, certificates etc; collection of bills such as electricity, telephone etc.; status of application of “Rajiv Palle – bata” and computer literacy for one person in each family. The NIC designed the software. The efforts have been taken for telemedicine and e-agriculture was minimal.

3.2.3 **MSSRF National Virtual Academy**

The M.S. Swaminathan Research Foundation chose to impart a pro-nature, pro-poor and pro-women orientation to technology development and dissemination as its main mandate when it started functioning in Chennai, India in 1989. This main mandate has given birth to the Information Village Research Project (IVRP) in 1992, and started implementing from 1997 onwards by establishing Village Resource Centres (VRC) and Village Knowledge Centres
After receiving successful results from IVRP pilot experiment conducted in Pondicherry, the initiative was further strengthened to the Jamsetji Tata National Virtual Academy (NVA) in the year 2003 by bringing various International and National partners, with an objective to empower vulnerable remote rural Indian communities by building skills and capacities through ODL mode, viewing that this education should reach every home and hut, and gives them a better control on their own development i.e., to make better choices, to take better decisions, and to create better livelihood opportunities.

During the study period it was observed that the NVA establishes VKCs on the basis of a needs assessment study or requests from local institutions. The NVA uses Hub and Spokes model for establishing connectivity between knowledge producing agencies and VKCs with wired and wireless technology, satellite based two-way video conferencing. The needs assessment study which uses Participatory Rural Appraisal (PRA) method helps MSSRF-NVA staff to understand existing political alignments and conflicts in the villages, caste related issues, and the history of people's interactions with Panchayat leaders and other government officials. Later, the NVA staff conducts group meetings with the help of village leaders, and a range of stakeholders (such as members of youth associations and self-help groups) to make agreements with village level organizations/groups on operating centres with cost sharing basis such as the community would identify and maintain a centrally located building to house the Village Knowledge Center (VKC), pay electricity and telephone charges, and identify volunteers (educated at least up to high school, 50% of who had to be women); and MSSRF would provide computer systems and other equipment required, ensure technical support and maintenance, train the volunteers and
involve them in developing relevant content and services. The NVA receives major funding from the Tata trusts and other national and international agencies to meet the running costs of the project.

Although, the MSSRF-NVA approach to develop an ICT project by involving rural communities and multiple stakeholders appears to be a social sustainable approach, the long-term financial sustainability of the project is not clear. During the study period it was observed most of the information and educational services being offered at VKC do not generate any revenue to meet the running costs of the centres; and the agreements with the local agencies have not been institutionalized. Moreover it was also observed that the agricultural information services at the VKCs were not much used by the users since the information provided at VKCs was not personalized to meet the information demands of the farmers. The Microsoft Unlimited Potential Programme provided computer literacy training was much used by the users at the VKCs. There were no noticeable efforts has taken for drought literacy or climate change management. The organization of information and learning content management was identified as a major challenge for NVA.

3.2.4 Aqua Choupal Model

Indian Tobacco Company (ITC) – International Business Division (IBD) launched Aqua choupal project on 7th February 2001 in Andhra Pradesh state of India. The stated objective is to use ICTs and web based platforms to provide all the latest local and global information on weather, scientific farming practices as well as market prices in regional language (Telugu); information
on products and services need to enhance farm productivity; improve farm-gate price realization and cut transaction costs, also facilitate in supply of high quality farm inputs as well as purchase of shrimps at the doorsteps of Andhra Pradesh shrimp farmers, and finally made an attempt to address the shrimp export oriented problems [115]. The company also started soya choupals in Madya Pradesh, wheat choupals in Uttar Pradesh, and coffee choupals in Karnataka more or less in the similar time.

The Aqua choupal model consists three components: (1) Aqua Care Center solves the shrimp farmers seed quality testing problems, (2) Aqua choupals deployed around the entire coastal belt provides information to the farmers on ITC and other companies shrimp purchasing market price information, and (3) Processing unit develops a barcode mechanism for identifying specific batches to address the export oriented issues such as identifying antibiotic residual batch elimination (or) muddy and mouldy smell batch elimination. All these components are interlinked with each other and enhance the efficiency of this model by building a concept of traceability into the supply chain.

**Aqua Care Centre**

Highly equipped ITC Aqua Care Centre provides a facility to the farmers to test their seed samples. There are two kinds of tests are available in this center (1) Virus tests including PCR test and MBV test (2) Wet lab tests including Formaline stress, Salinity stress, and Microscopic tests. ITC provides a computer printout of test results as a proof for the virus tests with photographs.
Aqua Choupals

60 Aqua choupals were deployed in the entire coastal belt of AP, except Vijayanagaram and Visakhapatnam. Aqua choupal set up consists of one computer with windows operating system, multimedia kit, and Land line connectivity, one dot-matrix printer, and Village Prathinidhi\(^6\) provided needful infrastructure including tables, chairs, fans and tube lights. This entire set up is either in a farmers house/his own property (rice mill or storage house) or in a rented building and maintenance costs borne out by Village Prathinidhi. ITC provides training to Village Prathinidhi on basic computer operations and troubleshooting; and also on local price determination from the generic price (international market price information) information available on the aqua choupal website. Village Prathinidhi receives 3 percent commission from ITC during procurement time.

The village parthinidhi procure shrimps based on the requests of company and approval from the regional Grader\(^7\); later the procured shrimps will be sent to Processing Unit (Visakhapatnam) along with duly filled two forms, (1) Form 1 provides the information about the Rate Chart\(^8\) and Batch No. of the material. (2) Form 2 provides the details of the grader id/farmer code and all the farmer and cultural practices details including farmer village information, type of culture followed, stocking density, pond preparation details, and chemical application in culture period,

\(^6\) Village Prathinidhi (prathindhi is a telugu term means representative) is a choupal operator. (In Soya and grain choupals the choupal operator is known as sanchalak)

\(^7\) ITC employed 5 Graders for the entire coastal belt. Grader checks the quality and decides whether the material meets the requirements of the suggested count or not. These Graders often change from one place to other, for avoiding to establish long term relationships between Village Prathindhi’s and Grader, which facilitates transparent and corruption free system. Grader is the intermediary between Village Prathinidhi and Processing Unit.

\(^8\) Rate Chart provides the details of the price information at the time of purchase.
hatchery source, and count number. The payment is made to the farmer immediately after procurement.

**Processing Unit**

Procured material from the field was being received at receiving section of the processing unit. Crates were being emptied at receiving section, and do the de-icing and washing with chlorine water. Then shrimps were moved to pre-processing unit for beheading, grading, peeling and soaking in chilled water, later the raw shrimps were processed according to the buyers requirement. Production supervisor enter all the processing details in processing unit prescribed format for tracing the material details.

**ITC Traceability Model**

The term "traceability" has been introduced to describe systems in which information about a particular attribute of a food product is systematically recorded from creation through marketing [116]. ISO 9000 (ISO, 2000) defines traceability as the ability to trace the history, application or location of that which is under consideration. When considering a product, the traceability can relate to the origin of materials and parts; the processing history; and the distribution and location of the product after delivery [117].

Procurement Officer of processing unit allocate code numbers to all the five ITC Graders (1,2,3,4,5). Grader allocate three digit code number (for example: 100) to the farmer at the time of procurement and write down the farmer code number and his (Grader) number in the form II
and fill the other information and sends the form to processing unit along with the material. In
the Processing Unit Plant In-charge give a barcode to the raw material before it go for processing

For example: 5F18-I 1/100 -801

Here 5 stands for year of processing 2005
F-stands for month June (A-January, B-February, C-March………………. L-December)
indicates month of processing
18- indicates Date of processing
I- stands for ITC
1/100 – 1 is the Grader code number and 100 is the farmer code number.
801 Code Processing plant

Consumer can trace the information with the help of this barcode, for example consumer buys
shrimp packed under the brand name Tastee Choice in United States and he/she wanted to track
back the source of origin, then the package returned to Tastee choice. Production Manager of
Tastee choice checks the code number on the package 5F18-I 1/100 :801

With the help of the 801 code, processing plant can be traced out (801 is the Jasper code given
by EIA) [118]. At Jasper, Production Manager of ITC retrieves the data stored against the code
5F18.

5F18 indicates the year, month and day of manufacturing information (5-2005; F-June; 18- Day).
ITC grader sends a report along with the material to processing plant, which stored against the
code, gives all the details of the cultural practices.
During the study period it was observed that more than 95% of the shrimp farmers own mobiles and communicating with village prathinidhi over phone rather than visiting to the centre; and the ITC stopped setting up of new centres. This was the reason for no incremental in the number of aqua choupals. However in the case of soya and grain there was tremendous increment in the number (more than 5000 choupals) since the farmers do visit the centres. Hence it is very important to consider the user preferred technology and socio-economic conditions of the users. Moreover from this it is evident that the ICT is not only Internet and computers, it is a combination of technologies which would works best in a given kind of situation. For example, in this particular model, the situations around the shrimp farmers forced them to adopt mobile technology as a communication tool for knowing market price information from choupal. Although, computers are useful for maintaining higher end databases and transferring the information in ICT centric projects, but integration of mobiles at user level works well in the case of aqua choupal. The observations reveal that the ICT centric solutions are not much effective, unless and until we correct the inefficiencies in the supply chain. For instance use of antibiotics at hatchery level is not corrected then it is difficult to get the successful traceability mechanism, even farmers provide correct information.

3.2.5 Kisan Call Centres

Kisan call center project, was initiated by Department of Agriculture & Cooperation (DAC), Ministry of Agriculture, Govt. of India on January 21, 2004 across the country, with an aim to leverage telecom infrastructure for delivering extension services to the farming community on
free of cost. The main objective of these call centers were to provide solutions to the farmers queries in the local language on dialing a toll free number 1551; and the secondary objective was to establish the linkages between the farmers and scientists. These call centers operate with an organizational structure at three levels with fresh agricultural graduates at Level I, Subject Matter Experts (SMEs) at Level II, and dedicated nodel cell experts at Level III to address farmers issues within 72 hours. All these Levels offices equipped with good quality telephone lines (128 kbps ISDN lines) with headphones and teleconferencing facility; computers with Internet connectivity, printers, and UPSs; Interactive Voice Recording System (IVRS); and CARETEL software to maintain record of queries addressed.

**Kisan Call Centre – Method of Operation**

The fresh graduates at Level I first receive the farmers query over phone, and responds to the call with a welcome message and enter the details about the caller (farmer name, village, problem description etc.), callers query and answer provided by the agent into the CARETEL software installed in the computer placed on the agents desk, and give a number to the farmer for future purpose. The agent contacts SME over phone, on his/her failure of addressing the query, by asking farmer to be on hold. If the SME is available, then the agents discusses the query with him/her and provide solution to the farmer, otherwise the call will be forwarded through an online system and the call get recorded on concerned SMEs desk. In rare cases the unresolved query from Level II will be forwarded to Level III (group of experts at nodel cell) to address the caller issue. This top-level organization structural set up ensures to address the farmers/caller queries. The farmers’ queries, which were not addressed at the time of call, will be addressed in
72 hours either by phone/post/e-mail or fax. At the end of the month all the queries asked by the farmers and answers provided by the Level I, II, III personnel will be submitted to Director of Agriculture office for ensuring the quality of answers. Sometimes these frequently asked questions will be shared to the other state kisan call centres.

**Implementation**

For effective implementation of the project, the DAC has chosen various public and private organizations (idea is to encourage public-private partnership) in the selected states of India. Though the toll free number 1551 helps farmers to reach these centres virtually, the physical reach to these centres is not possible. All the designated agencies advised by the respective state authorities to do not reveal the address of the centres.

**Findings**

The Kisan call centers use combination of technologies (telephone, computers with Internet and IVRC) to provide services round the clock. During the study period, it was observed there were six agents working in two batches for Gujarat at Level I, the first batch with three works from 6 am to 2 pm, and second batch with three from 2 pm to 10 pm. After 10 pm, the IVRS records the farmer queries, which will be addressed by the agents on next day morning over phone by making calls to the respective numbers. It was noticed so far the centre has not received any calls after 10 pm. The centre receives around 200 calls per day. According to the data the highest calls received in a month so far recorded as 10,000 calls and stood first in India, and

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9 Personal discussions with the agent working at the Kisan Call Centre, Ahmedabad
Maharashtra received second place with 5000 calls. Thanks to Chief Minister of Gujarat and state government for taking interest and efforts such as signboards in public places and advertisements in television channel, to help Gujarat farmers to learn about kisan call centers. According to the then Directorate of Agriculture, Gandhinagar, “Kisan call centers provide information on various agricultural and allied field issues including cereal crops, pulse crops, oil seeds, medicinal and aromatic plants, fisheries, and veterinary, dairy. It also provides information on suitable local seed varieties, information on subsidies, crop insurance etc. In short Kisan call center provides information whatever farmer wants, and our six agents at Level I, six SMEs at Level II, and group of experts at nodel cell working for addressing all the queries raised by the farmers.”

Although, Kisan Call Centre appears that the farmers gets needed information on dialing 1551, the study argues why only 10000 calls (maximum) per month?

During the study period it was observed that the state agency neither provides knowledge base to the call centre agents (except available FAQ database) nor provides training. They recruit fresh agriculture graduates and put them on job from day one onwards with a monthly salary of Rs. 3000/-. These agents receive help from the SMEs over phone (or) during their monthly meetings at nodel cell. “The SMEs do not prepare any knowledge base, whenever level I agent forward any unresolved query they use their experiences and knowledge in the respective fields for addressing the queries”, according to an agent at Ahmedabad. The agents were not happy with the remuneration, and they were always in search of better opportunities. None of the agents have more than three months experience. During the discussions agents said they would be with
Kisan Call Centres until they get a better opportunity, so far no body worked for not more than six months. From this it was evident that most of the queries handled by fresh graduates who are not much familiar with the field level issues. Since the SMEs are not full time employees of call centres, the level I fresh graduates hesitate to disturb SMEs each and every time. The SMEs are employees of a research organization or a university where they have their regular work, and they have to balance their time with this additional responsibility.

**Summary**

Although the kisan call centers were operationalized across the country, the impact was minimal, because of the non availability of good quality content/ knowledge base and untrained fresh graduates loosing the trust of farming community; and limited infrastructure disappointing the callers with engage tone. Hence this particular study suggests rather than establishing an extra layer with new private or public parties, using existing structures for setting up these centres in all mandal agricultural offices enhances the efficiency and quality of the system, and the trained Agricultural Officers and Agricultural Extension Officers, who are aware of the local conditions and local farmers problems, increases the reliability and trust among farming communities with their quality services. The evidences from the study suggests that there is a need of good quality content on various agriculture and allied issues includes frequently asked questions in the digital format with better search engines. Moreover it is essential to make farmers aware - from where and whom they are receiving advices, since the trust is a valuable commodity in rural areas.
3.2.6 Warana Wired Village

The Warana Wired Village Project was launched in 1998 by the IT Task Force of the Prime Minister's Office to demonstrate the use of ICT to accelerate socio-economic development of a cluster of 70 villages around Warana in the Kolhapur and Sangli districts of Maharashtra. The Warana Project is jointly executed by (1) the National Informatics Centre (NIC), the Planning Commission, GoI, (2) the Directorate of Information Technology, State Government of Maharashtra, and (3) the Warana Sahakari Dugdh Utpadan Prakriya Limited (WSDUPL), Warana Nagar, with a total cost of Rs 25 million which was borne jointly by the three agencies in a ratio of 50:40:10 [119].

The stated objectives of the Warana Wired Village are:

- To provide computerized facilitation booths in 70 villages with the range of information and services in local language including crop, market price data, government employment program and educational opportunities
- To create database of villagers on various socio-economic aspects
- To increase the efficiency, transparency and productivity of the Warana Co-operative Society

The system had provided both web-based and Intranet-based application. In web-based applications the services include agriculture market information, agricultural schemes, computer learning aids, village information systems, educational and vocational guidance systems,
government documents and procedures systems, and computerization of the local cooperative market, whereas in Intranet-based systems include the wired management of sugarcane cultivation, land records, the computerization of the Warana Milk Dairy, and a Grievance Registration and Redress System.

NIC had designed, developed and implemented this project. The central hub has a system with Pentinum II with 64 MB RAM, 4.1 GB hard disk and 32xCD-ROM drive. It is linked to NIC Pune through 64 kbps bandwidth VSAT connection WAN link. Each computer booth had Pentinum with 64 MB RAM, 2 GB hard disk, printer and UPS power backup system. These booth were connected to central hub via dial-up connection with modem and telephone with a speed around 19200 BPS to 28000 PBS [120]. NIC had also developed 15 different web-based applications. They had developed applications related to agriculture produce, schemes and crop technology, land records database, GIS application, education and other application

Though the project has designed and developed with a great enthusiasm, the application which they developed had not used fully. The reasons were slow access to the Internet, insufficient awareness creation among the villagers, and the low levels of literacy in the area in spite of high levels of income. There have been problems in the implementation of computerization of land records. The GIS has become obsolete, to a large extent, due to lack of updating of the database. Microsoft Windows-based applications like crop guide, schemes of agriculture department, employment schemes and vocational guidance are non-interactive and have not been updated. The market rates of the agriculture produce have been dysfunctional and unused due to poor
information management. The project remained dominated by NIC officials and technocrats, causing severe problems in community participation and management of services. The pilot project, due to its very high cost, has not been replicated anywhere in India.

3.2.7 KISSAN Kerala

In the early 2000, Karshaka Information Systems Services and Networking (KISSAN) was started by the Indian Institute of Information Technology and Management – Kerala (IIITM-K), Department of Agriculture, Government of Kerala and the Kerala Agricultural University. The stated objective is to support farmers and different agricultural related people through IT by linking them with specialized groups of agriculture consultants or experts over a knowledge management portal system. The mass media television program “Krishi Deepam” played a critical role in building network among experts and farmers and agricultural related field people, and making information available in the form of audio and video to farmers through satellite based broadcasting, cable TV networks, Internet kiosks in Krishi Bhavans. Krishi Bhavans are agri-kiosks located at village panchayat level for providing web access to farmers and act as a bridge between farmers and expert team.

At the initial stage of implementation, the project has considered the views of state department personnel. However, the project has got more clear definition after discussing project team with Agricultural Extension Officers (AEOs) who had substantial field experience. State Department of Agriculture was an active partner in formulating initial objectives of the Kissan project.
first phase of its services was started during the month of March 2003 and the project was
officially inaugurated on November 01, 2003 (Kerala formation day).

Kissan has a multimode approach consisting of the following major components (a) Web
services (b) Agri-data centre (c) Television based agricultural information dissemination system
(Krishideepam) (d) Agri-information Kiosks and (e) Call centre.

One of the most important components of the Kissan project is the web service module, which
offers information services over the web. The portal [121] is designed with a view to cater to the
information needs of the farmers as well as government officers. The stated specific information
services are (a) query management services (b) state-wide market information on various
agricultural commodities (c) online agri-advisory services (d) online fertilizer recommendation
services (e) weather information and forecast (f) management of crop, fertilizer, water and soil
etc.(g) harvesting and processing (h) administrative information (schemes, working instructions,
financial assistance etc) (i) interactive discussion forums (j) success stories, case studies, best
practices (k) planting material (selection, variety, cost, etc.) (l) location specific information and
recommendations. The visitors for these web portals were nearly 6,500 to 7,000 and the most
accessed web pages include crop information and the query management system10.

The query management service is one of the most important components of the Kissan project.
Through the query management farmers can contact experts about their crop problems; farmers
can also attach images of their crop specific problems along with their queries. When a query is

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10 Personal Discussions with the Primary Researcher, G. R. Kiran, LSE Student.
posted AEO takes initial step to answer that specific question, if in case he could not able to answer then AEO posts that question either formally or informally using any media (telephone, e-mail, etc.) to senior experts in the Kerala Agricultural University / Research stations / Department of Agriculture. The query was usually answered by the experts within two days either by sending links or by emails. Farmers can also be able to find answers to their queries through browsing the website of this project. However the query management module is available only in English.

The web portals displays the details of prices in the domestic market (inside the Kerala market) as well as prices of commodities outside Kerala and in international markets, the same information is also conveyed to the Krishi Bhavan through telephonic services. These Web portals also made updated weather information available to the farmers.

The agricultural data centre located in IIITM-K, acts as the backend for the web services of the project. It provides a single platform to aggregate available information on agriculture, helps customize the information dissemination, speeds up the content process analysis and provides an open platform for the content providers which are connected to the network environment. The data was collected from different formal and informal sources including the Farm Information Bureau (FIB), Directorate of Agriculture, Kerala Agricultural University, District Agricultural Offices, selected Krishi Bhavans, research stations, etc. The data processing and research unit continuously interact with the domain team and keep changing the structure of databases, querying methods & screens, updating video content, price information, etc.
The important element for the success of this project was Krishi Deepam which provides value added’ information to farmers preferably targeting them at their own homes through the medium of television. The project was established an in-house facility for creating the relevant content for transmission over a television channel. The programme is telecast at 5.30 pm on Fridays, with a repeat telecast on the subsequent Saturday at 9 am. A second repeat telecast of the programme is done on the subsequent Mondays at 6.30 pm through a second Asianet channel called the Asianet news channel. It is estimated that the program reaches more than 20 lakh regular viewers across the country. Krishi Deepam telecasts different programs such as news about successful cases and views of experts about various crops. One of the interesting aspects of the programme is the feedback mechanism. At the end of every episode specific contact details are given for farmers to respond and clarify. The team receives on an average 130 calls and 120 e-mails a month based on the television programme. Project also provides copies of the programme in VCD format to the agri-kiosk so that the farmers who do not have a television can be viewed over the computer.

Agri-information kiosks are the extension of the web services to their field office, the Krishi Bhavans, with a view to help the bilateral flow of data and to also encourage an IT mediated interface with farmers. All the kiosks are equipped with latest multimedia computers, web cameras, network accessories and dedicated Internet connections. The operation of each kiosk is supervised by the AEO of the Krishi Bhavan and is supported by the agricultural assistants. The typical services offered through the kiosks to farmers include farm/crop advisory services, helping them with the online query management services, showing video programs and of late using online fertilizer recommendation system etc.
The Kissan Kerala project transforms the existing Krishi Bhavans to information kiosks with the use of ICTs. The project is classic example to strengthen the existing systems with the introduction of new tools and new methods rather than establishing a new layer out of the existing systems.

3.2.8 Akshaya

Akshaya, a public-private partnership project, was launched in November 2002 in Malappuram district of Kerala, India. Initially the project was originated from the district panchayat for 100% district wide e-literacy training, later this was converted into RKC project by the Department of Information Technology, Government of Kerala, with an aim to (1) set up multi-purpose community centre, one each for approximately 1000 families (2) making at least one person in every family functionally ICT literate, and (3) creation of relevant local content.

Before starting the project the District Panchayath conducted needs assessment survey to identify the ICT skills and existing resources in the district. Based on the survey results an e-literacy content was generated, and discussed with the Science and Technology Entrepreneurship Development (STED) for providing training and identifying the possible locations for setting up Akshaya kiosks centres. In agreement with the District Panchayath the local bodies identified the centre entrepreneurs to provide e-literacy for one person in each family. A training charge of Rs. 120 per person paid to the centre entrepreneur, which was borne out from the Village Panchayath Rs 80 and Rs 20 by the Block and District Panchayath\(^1\).

\(^{11}\) Personal discussions with Primary Researcher, G. R. Kiran, LSE Student, of Akshaya
Over six months (till 31 December, 2003), the centres focused only on e-literacy, with a door-to-door campaign by KSITM (Kerala State Information Technology Mission). Officially, 5.6 lakh people were given e-literacy training. Using a CD with fifteen hours of games and multimedia content, the e-literacy training focused on enabling individuals to use computers without fear or inhibition. About 65% of the people who came to study were women. Many centres began to act as a hub for community activities like women’s club, children club and etc\textsuperscript{12}.

In January 2004, all centres were provided with high-speed internet. A CD called e-vidya was designed and provided by the project team in April 2004. It contain lesson on using word-processing and spreadsheets and they charges Rs 450 per person. This was success in most of the kiosks and mostly youngsters and school children were the users during April and May month.

Since the state government had been playing a facilitation role from the beginning of the project, the Akshaya is a classical example to show the role of local governments (Panchayats), the participatory approach and local implementation approaches in an ICT project.

### 3.3 Observations and Recommendations

Although ICT enabled RKCs opened up new avenues and brought many benefits to the rural communities, the degree of their effectiveness and framework for successful implementation of information services is uncertain; and analytical understanding of the relationship between the

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\textsuperscript{12} Personal discussions with Kiran
enhanced deployment of ICTs and development outcomes is unclear or ambiguous. Following are observations from the assessment of the RKC project sites:

- There is prevalence of top-down approaches with few attempts to reflect the end users preferences and needs.
- Production advisory services and market information access do not go together in all such efforts.
- In almost all the projects, the participation of agricultural education and research institutions appears to be marginal.
- In almost all the projects, the efforts taken for addressing the climate change issues appears to be marginal.
- Localization and customizability of content are still not practiced on a significant scale.

The study further states that ICT and techno-infrastructure should consider judicious blend of traditional and modern technologies depending on what would works best in a given kind of situation. The efforts should be made to develop medium to high level of farmers’ faith in ICT enabled services. It is also suggested that Participatory Rural Appraisals and Rapid Rural Appraisals should be carried out to know about information needs of the farmers, and also to learn about the user preferred technology. Identification of the typical community problems would be the first step to start any kind of ICT mediated innovation (or) application. Emphasis should be given to define methodologies for transforming generic datasets into locale specific information for their effective use.
The study recommends to understand and analyze influencing factors such as socio-cultural, technical, economical and political factors and functional factors such as content and capacity building while designing and planning Rural Knowledge Centres. Based on these observations a framework was proposed for planning and designing of ICT enabled RKCs.

3.4 Existing Frameworks for RKC Projects

Most of the studies on RKCs till date have focused on the operational and sustainability aspects. Theoretical or conceptual framework for planning and evaluation has largely been missing from the debate [122]. Roman [122] has provided a very cogent theoretical and conceptual framework for telecenters using theory of diffusion of innovations [123]. He describes three principal attributes of innovations which could be very useful in RKC research; relative advantage, compatibility, and complexity. He also underscores the importance of socio-structural environment in innovation, diffusion and adoption. In one of the early attempts to understand RKCs within the diffusion framework, Johnson [124] examines how incorporating a gender dimension into RKC design can enhance their diffusion among women. According to Roling, Neils, [125], the evolution of rural knowledge centre is a function of 7 Cs, i.e., Connectivity, Content (Static and Dynamic), Context, Cash, Culture, Community and Communication. Ensuring the 7 Cs requires a process of Mobilization, Organization, Capacity Building, Technology Incubation, Technical Support, System Management. Though Neils analyzed these aspects well, he forgotten to include the factors influences the process. Since there are not many frameworks, and existing few frameworks give little idea on planning and designing of rural
Knowledge Centres, the study made an attempt to propose a framework to distinguish between processes, functions and influencing factors; and discussed in detail how these relate with each other during the evolution of RKCs.

### 3.5 Proposed Framework for Planning and Designing of Rural Knowledge Centres

Setting up of a computer centre in a village does not constitute a knowledge centre. The translation of a rural computer centre into a knowledge centre requires an intensive social process. A rural computer centre evolves into a knowledge centre only when modern ICT facilitates transfer of information into knowledge. A rural computer centre providing market price is an information centre. A rural computer centre, which enables the rural community to understand the differential mechanisms through which prices are influenced and determined, is a knowledge centre.

Most of the rural ICT projects focus on providing information services, rather than looking at the knowledge management strategies. In agriculture and rural development, the importance of uneven distribution of knowledge in explaining variations in Total Factor Productivity (TFP) is being increasingly recognized [126]. Mere information in the form of flow of messages may not be able to address the problem. Knowledge as the creative result of a flow of messages anchored on the commitment and beliefs of the actors involved in the process and resulting in human action is needed. Environment in which knowledge is built; capacity building and empowerment processes, social mobilization and organization are the important factors which have to be taken
into consideration while transforming a rural computer centre into a knowledge centre. Freire [127] argued in the case of the pedagogy of oppressed vis-à-vis literacy programmes, the need for dialogues and discourses among learners to understand the world instead of mere understanding of words. Similarly in the process of knowledge management, dialogues and discourses of among rural community are essential. Modern ICT, if properly defined can help to broaden the canvass for dialogues and discourses among the rural community.

3.5.1 Information Vs. Knowledge

The differences between information and knowledge are being spelt out in many books and papers in recent times. Many authors have described the progressive processes from data to information to knowledge to wisdom in terms of purposes and contexts. *Data refers to raw materials such as facts and figures that could be collected by an information system. Information refers to analysed data often presented in a form that is specifically designed for a given decision-making task, and transmitted to/received by decision makers. Knowledge refers to subsequent absorption, assimilation, understanding and appreciation of that information*. Pomeroll and Brezillon [128] quoting Newell and Simon [129] argue that knowledge is information incorporated in an agent’s reasoning and made ready either for active use within a decision process or for action. It is the output of a learning process. Thus the roles of knowledge are to: (1) transform data into information, (2) derive new information from existing ones, and (3) *acquire new knowledge pieces*. Wisdom is considered as meta-knowledge, knowledge mobilized to acquire new knowledge and update it. From a philosophical angle wisdom refers to
the evaluation of knowledge vis-à-vis the norms, values and morality [128]. Knowledge management focuses on definition of the context and validation of the information. It also increases the connections among people (who have knowledge) that would likely not occur without the help of a knowledge management system [130]. The process of searching answers for the following questions characterizes the dimensions of knowledge management;

*Who created the information?*

*What is the background of the creators of information?*

*Where and when was it created?*

*How long will the information be relevant, valid and accurate?*

*Who validated the information?*

*Who else might be interested or has similar knowledge?*

*Where was it applied or proved to be useful?*

*What other sources of information are closely related?*

*How to test and validate some of the concepts?*

In the context of rural community, the presence of traditional knowledge is another important dimension of knowledge management. The social construction of traditional knowledge and the blending of the new knowledge with traditional knowledge are the components of knowledge management. Thus knowledge management necessitates a participatory management in which the rural community plays a crucial role of absorption, validation, critical evaluation, assimilation, understanding and appreciation of information. A paradigm shift in the concept and practices of extension will occur only when the community develops its own framework for knowledge management.
According to Marwick [131], knowledge management takes place at four levels: Socialization in which exchange of tacit knowledge taking place within a community; Externalization in which a set of tacit knowledge is converted into explicit knowledge; when the explicit knowledge is shared, the process of combination takes place; and finally internalization in which socialization, externalization and combination lead to further set of new tacit knowledge. Through such a process the community plays a crucial role in converting a generic information and knowledge into locale specific knowledge. Such a system requires both vertical (between macro and meso organization and villager) and horizontal transfer of knowledge (between villager to villager) in which the knowledge creators at the macro and meso level interact with the community and through an interactive learning process, both the stakeholders define the roadmap for knowledge management. The ICT enabled RKCs enhance the socialization process through broadening the horizontal transfer of knowledge. The creation of databases based on local knowledge and traditional knowledge represents the process of externalization in which tacit knowledge is converted into explicit knowledge. ICT also facilitates exchange of explicit knowledge within and between communities leading to a process of combination. Finally internalization of explicit knowledge into tacit knowledge represents the framework of knowledge management. Thus in a knowledge centre villagers are not mere consumers of information but partners in knowledge management.

The various dimensions of Rural knowledge centres vis-à-vis knowledge management are

Centres of human resource management
Centres of Information such as weather, trade, market, transport etc
Centres of governance for delivering development with least social and economic transaction cost.
Centres blending traditional wisdom with frontier sciences

The community ownership is crucial. The various sections of the community (vis-à-vis caste, class, gender, age, religion and region) should be involved in the entire process of developing the programmes, content, delivery methodologies, learning processes, and assessment, and in the use of innovative technologies. Such a participatory approach is necessary for ensuring the relevance of contents and technologies within the social context in which the knowledge centre is operating.

### 3.5.2 Proposed Framework

![Diagram of Proposed Framework](image)

**Figure 1**: Framework for Planning and Designing of Rural Knowledge Centres
Process in evolution of a Rural Knowledge Centre

**Needs Assessment:** Rural communities have own social dynamics, and wide diversity of interests. The solutions to their problems will be highly local and highly specific. So identification of their needs, problems and technology preferences is a first step to start RKC in any location. After identification, analysis is required to provide relevant information resources through user preferred communication techniques for satisfying their information needs.

In most of the government projects, Rural E Seve, Rajiv Inernet Villages, the government officials assumed that they know what is needed at the grassroots, and established the infrastructure for starting the activities without making any committed involvement of the local communities. That’s why most of the projects even kick started the activities very well but in the long run they lost that tempo, and resulted failure in achieving the long-term sustainability. In the case of ITC e-choupals, though the project personnel made efforts in identifying the needs of users, they didn’t consider the user preferences in technology identification. This resulted to look for alternative mode of communication in the case of coffee and Aqua choupals. From this it clearly emerges, instead of following top-down approach, RKC project should follow combination of bottom-up and top-down approaches with community mobilization to ensure the long-term sustainability of the project.

**Mobilization:** Community mobilization and resource mobilization are essential for ensuring the long term sustainability of the RKC project. Involve the communities in each and every evolution process of RKC, includes needs assessment, identification of the user preferred
technology, and resource mobilization; and give sense of ownership. Once the communities realize that the RKC project is being operated by them and for their benefit then the operation will go long-way with the faith and motivation of involved communities. During the resource mobilization, make the communities to share the project costs in terms of community buildings, electricity, and human work hours. Motivate them to identify and establish linkages with local knowledge producing agencies, and their role in RKC operations; and make them to realize the information need and knowledge management process and pattern; and make them to understand structural differences in the community i.e., caste, class, religion, region, gender, and age; and realize them need of allowing users to use facilities of RKC irrespective of structural differences for achieving the development.

**Capacity Building** Capacity Building is often defined in the literature as a process to develop a certain skill or competence to enable individuals (or) organizations to perform effectively. In this context capacity building is essential to both communities (individual level) and RKC (organizational level) for long term execution of activities effectively. Capacity building is continuous long term process as reported by United Nations Development Programme (UNDP). It was therefore, since inception of the project continuous capacity building to the communities and RKC is essential on various areas includes (1) Organization - Capacitate the communities on identification of organization types, build organizations, planning programmes through their organizations, linking the organization with the macro, meso and local organizations for horizontal and vertical transfer of knowledge, facilitating the organizations to define the self-sustainable interventions, developing contractual arrangement between various stakeholders,
organization management, and conflict resolution (2) Literacy – the focus of first phase should be on digital literacy includes literacy training on new software and basic trouble shooting, and the focus of second phase is on subject matter literacy training includes use of technical skills for gaining subject matter literacy; and ICT enabled knowledge management includes content creation, consolidation and delivery.

**Installation and Incubation:** After ensuring the communities are mobilized and capacitated, install services, and introduce them by creating awareness. The period in between installation and implementation is known is incubation period.

**Operations and Monitoring:** In the initial stages monitor each and every service, the way it is offering and the way communities are receiving.

**Evaluation:** After certain period of time, there is a need to conduct an evaluation study to understand various insights and dynamics of a project. Each learning experience should be fed back into the system to make a project sustainable.

**Functional and Influencing Factors**

The functional factors such as content and capacity building play a vital role in ensuring the long term sustainability of RKCs. The economical, political, socio-cultural, technical and legal factors need to be considered carefully while planning and designing of RKCs. The case studies discussed in Section 3.2 explains the role of functional and influential factors and their importance in establishing RKCs, for instance ITC Choupals case discusses the need of user
preferred technology for their various choupal models, whereas the Rajiv Internet Villages discusses the way the political factors influence the RKC.

### 3.6 Rural Knowledge Centres and Drought Preparedness

In spite of the tremendous potential of ICTs, the developing countries have not adopted a sound strategy to utilize the ICTs and ICT enabled RKC. The application of ICTs in drought mitigation efforts is far from clear. The broad issues identified by Commission on Science and Technology for Development (UNCSTD) on ICT opportunities for developing countries, includes new types of learning and education to bring awareness, a ‘wired’ civil society, new forms of commerce and trade, among others, all provide hints of tremendous potential. New types of learning and education to bring awareness on several aspects including education on drought require a paradigm shift from traditional classroom based education to flexible open learning environments. Providing open learning opportunities to the rural farm communities who are away from the classroom milieu is not an easiest approach, which requires to address several issues including (1) continuous production of locale specific demand driven digital content (2) development of innovative capacity building mechanisms for making communities to adapt modern learning and educational approaches. Hence there is a need to define a strategy to look at local level institutions and the role of ICT enabled RKC in developing suitable methodology and mechanisms for knowledge acquisition and delivery to address open learning approaches on drought preparedness for farm communities live in different agro-climatic region.
National and International experiences reveal that drought can be managed – by being in a state of readiness to combat it, by forecasting, by mitigating its impact on humans and animals. Prior to independence, measures to tackle famine and minimize deaths due to starvation were evolved and followed. At that time there were no mechanisms to monitor droughts scientifically and technologically. But now the ICT enabled RKCs help in developing, and coordinating an institutional mechanism to monitor/predict/warn occurrence of drought at local level, for which a methodology need to be defined to generate coping mechanisms or support systems at local community level.