Chapter 1   Introduction

1.1   Background

Drought and desertification are serious problems that significantly affect millions of people and ecosystems. Frequent droughts, especially in developing countries result in untold economic dislocation, environmental damage, personal suffering, hunger, and even deaths among large numbers of people. When drought occurs, farm communities are usually the first to be affected because of their heavy dependence on stored soil water. This can be rapidly depleted during extended dry periods. If rainfall deficiencies continue, even people who are not directly engaged in agriculture will be affected by drought. This underscores the vulnerability of entire societies to this phenomenon [1].

The degree of vulnerability to impacts of drought varies significantly from one nation to another. However, many nations go with the crisis management approach, namely, of providing relief when drought occurs rather than looking for drought preparedness approaches. This is because drought covers large areas, and is difficult to monitor with conventional systems. On the other front, the communities’ appear to forget the miseries of one drought season with the onset of
good rains; and those miseries usually continue from one drought to the next. According to Kogan [2], timely information about the onset of drought, its extent, intensity, duration, and impacts can limit drought related losses of life, minimize human suffering, and reduce damage to the economy and environment. Studies on drought, carried out in different parts of the world, also suggested that preparedness is better than relief and information is the backbone of drought preparedness [3], [4]. The Disaster Management Authority of India has made it a priority to identify and develop new systems that combine early warning arrangements with access to appropriate services to avoid massive damage caused by drought [5]. The Drought Management Plan by the Department of Agriculture, Republic of South Africa, reveals that institutional arrangements, integrated institutional capacity, disaster risk assessment and reduction planning, and response and recovery are key performance areas, and information and communication; education, training, public awareness and research; and funding are the driving forces for effective drought management [6]. In the comprehensive, integrated national climate monitoring or drought early warning system of the United States a critical component of planning for drought is the provision of timely and reliable climate information, including seasonal forecasts. It aids decision makers at all levels in making critical management decisions to reduce the impacts of drought and other extreme climate events [7], [8], [9]. The plan of Agrometeorology Warning System (AgWS) of Brazil proposes to have an operational system, with at least 120 automatic weather stations, to provide information to farmers and governmental policy leaders on routine analysis of weather, climate variability, crop climate requirements, and pest management to reduce risks from drought, frost and dry spell [10]. In Greece, the
government has begun to inform farmers about the potential impacts of climate change. In France drought preparedness and prevention schemes are part of the legal framework on water resource development [11]. In addition, a "Global Drought Preparedness Network" (GDPN) is providing an opportunity to the nations and regions to share experiences and lessons learned (successes and failures) through a virtual network of regional networks; for example, information on drought policies, emergency response measures, mitigation actions, planning methodologies, stakeholder involvement, early warning systems, automated meteorological networks, the use of climate indices for assessment and triggers for mitigation and response, impact assessment methodologies, demand reduction/water supply augmentation programs and technologies, and procedures for addressing environmental conflicts.

There is thus substantial International interest in utilizing knowledge and information in enhancing drought preparedness among vulnerable rural farm families. However, the meteorological departments of many developing countries at the moment are poorly equipped to function effectively for drought preparedness because of inadequate analytical tools for drought monitoring, unsuitable information products and insufficient data sharing [12]. There is a need for new institutional arrangements with modern, effective, and reliable systems to enable information flows within and between concerned governments, grassroots institutions, scientific institutions, and regional and international organizations involved in this field. Emerging pluralistic institutional arrangements and contemporary Information and Communication Technologies (ICTs) such as satellites, computers and improved communication technologies have been identified as opportunities for monitoring and disseminating critical drought-related
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information; promoting regional cooperation, creating networks and partnerships, methodologies to introduce techno-interventions, capacity building and information management were identified as essentials in developing such kind of systems [13] [14]. Some developing countries have made an attempt to use contemporary ICTs with new institutional arrangements such as Rural Knowledge Centres (RKC)\(^1\) in top-down manner, for utilizing knowledge and information in enhancing drought preparedness among vulnerable rural farm families. However international experiences revealed that such top-down flow of important information must combine with a bottom-up process for its rapid and effective use by the intended recipients. The Commission on Science and Technology of the UNCCD recommended to establish such communication framework by combining both the top-down and the bottom-up approaches in information management and community mobilization [15].

A coalition of institutions anchored by ICRISAT to design and test such an arrangement was set up with the name the Virtual Academy for the Semi-Arid Tropics (VASAT). The VASAT focused on building a framework to foster drought preparedness among vulnerable rural farm families through improving their coping capacities [16]. In this study, an attempt has been made to refine the framework in terms of wider and more pervasive use of ICTs, especially using new advances in learning and content management technologies; open and distance learning methods; and drought early warning techniques.

\(^1\) Rural Knowledge Centre is a new institution in the rural milieu. It is a one-stop centre hosted in a public space that provides public access to ICTs for educational, personal, social, and economic development.
1.2 Concept of Drought

Drought is a normal, recurring feature of climate; it is a natural phenomenon, appears virtually in all climatic regions, includes high as well as low rainfall regions [17]. Tennehill [18] describes drought as a creeping phenomenon, since the onset and end of drought is difficult to determine, and the effects of drought often accumulate slowly over a considerable period of time and may linger for years after termination of the event. Bryant [19] found that the drought ranks first among all natural hazards based on various characteristics, such as severity, duration, spatial extent, loss of life, economic loss, social effect, and long-term impact.

In spite of its severity on economic and social impacts, drought is least understood of all natural hazards due to its complex nature and varying effects on different economic and social sectors [20]. The understanding and perception of drought varies from one region to another [21]. For instance in Saudi Arabia and Libya, droughts are recognized after 2 to 3 years without significant rainfall [22] [23], while in Bali, Indonesia, any period of 6 days or more without rain is considered as drought. If the Nile does not flood any year in Egypt, it is considered as drought regardless of rainfall [24]. In India, there are two approaches in identifying drought, based on the methodology given by the Irrigation Commission [25] and the National Commission on Agriculture [26]. According to the Irrigation Commission of India, drought is a situation occurring in an area when the rainfall is less than 75 per cent of the normal; this definition is derived from the Indian Meteorological Department (IMD) definition, whereas the National Commission on Agriculture of India defines drought as an occasion when the rainfall in
a week is half of the normal or less, when the normal weekly rainfall is 50 mm or more. However, in India the declaration of drought or as a scarcity affected area for providing relief to the population is done by the Revenue Department of the state government, on the basis of estimation of the prospective harvest. The assessment is based on the ‘annawari system’ (crop being assessed on the basis of ‘annas’\(^2\)). If the prospective harvest is estimated to be up to 12 ‘annas’ (75 per cent) the crop is normal; and below it up to 6 annas, (37 per cent), the crop is below normal. A scarcity situation is declared when the crop prospects are less than 6 annas.

Although many definitions are available on drought, none of them adequately defines drought in meaningful terms for scientists and policy makers. In most of the cases the thresholds for declaring drought are arbitrary, and they are not linked to specific impacts. These are the problems creating misunderstanding in formulating drought definitions, and lack of consideration given to the scientists or disciplines on applying these definitions in actual drought situations for impact assessment, drought declarations or revocations for eligibility to relief programs. Wilhite and Glantz [27] analyzed more than 150 definitions in their classification study, and broadly categorized droughts into four types: meteorological, hydrological, agricultural, and socioeconomic.

Meteorological Drought: “A period of more than some specified number of days with precipitation less than some specified amount” [28].

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\(^2\) Anna is a unit of currency in India in the ancient days.
Hydrological drought: Concerns with the effects of dry spells (periods without precipitation) on surface or subsurface water resources. This will result in decline in water levels of rivers, lakes, reservoirs, and ground water resources.

Agricultural drought: Occurs if the crop demand for water is not met; depends on prevailing meteorological conditions, biological characteristics of the plant, its stage of growth, and the physical and biological properties of soil. This will result reduction in crop yields significantly.

Socioeconomic drought: Relates to the features of the socioeconomic effects of meteorological, hydrological, and agricultural drought. These effects may include price inflation, famine, population migration, and political upheaval.

The significance of each type of drought to a region mainly depends on its agro-climatic and socioeconomic characteristics. However, linkages between climate and agriculture are pronounced and often complex. Crops and livestock are sensitive to climate change in both positive and negative ways. Agricultural systems are most sensitive to extreme climatic events such as droughts, floods and hailstorms, and to seasonal variability and changing rainfall patterns. Against this backdrop, farmer adaptations are influenced by many factors, including agricultural policy, prices, technology research and development, and agricultural extension services [29]. However, inadequacies in current agricultural extension system and non availability of necessary and timely information on climate change often made the rural poor farm families to bear disproportionate burden of direct damage from catastrophes and climate change as concluded by most studies in developing countries [30]. Hence there is a need to
examine the existing agricultural extension systems, and need to define arrangements and methods for effective drought information flows and data sharing at micro-level to prepare farm families against drought and disasters.

1.3 Expert-Farmer Information Flows: Agricultural Extension

From the ages, agricultural extension has been recognized as an essential mechanism for enabling information and Knowledge transfers among experts and farmers [31]. It was not known when the first extension activities took place, however, it was recorded in the history that Chinese officials were creating agricultural policies, documenting practical knowledge, and disseminating advice to farmers at least 2000 years ago, for instance in approximately 800 BC, the minister was responsible for agriculture under one of the Zhou Dynasty emperors by taking efforts on organizing teaching of crop rotation to farmers, leasing equipment and building grain stores and supplying free food during times of famine [32]. The birth of modern extension service has been attributed after Irish Famine³ [33]. As on the date there are many extension models are in use to satisfy the information needs of farm communities by enabling the information and knowledge transfers among experts and farmers. Each model has its own concepts, advantages and disadvantages.

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³ The Irish famine in 1845 was result of successive potato crop failures due to potato late blight disease. Since the Irish depend on the potato, the failure of the potato crop and the insufficient and ineffective relief for stopping the outbreak of starvation and disease created a disastrous.
1.3.1 The Concept of Agricultural Extension

Extension, the term first used in England in 19th Century to describe adult education programmes. The universities later adopted this to carry out their activities beyond the universities and into the neighboring community. The term was used in 20th century to carry out the advisory services in many parts of the world. However during the evolution process, from 19 to 20th century, the extension has been defined in many ways and concepts taken several reforms, for instance Brunner and Yang [34] reported central task of extension is to help rural families help themselves by applying science, whether physical or social, to the daily routines of farming, homemaking, and family and community living, whereas Saville [35] defines Extension has been described as a system of out-of-school education for rural people. Bradfield [36] discusses the role of extension worker is to bring scientific knowledge to farm families in the farms and homes for improving the efficiency of agriculture, whereas Maunder [37] reports that extension is a service or system which assists farm people, through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living and lifting social and educational standards. In 1974, Van Den Ben first reported [38] that extension involves the conscious use of communication of information to help people form sound opinions and make good decisions. This was first published in Dutch edition by Boom, later quoted in English editions in 1988 and 2004. In 1980s Agricultural Extension has been discussed as assistance to farmers to help them identify and analyse their production problems and become aware of the opportunities for improvement [39], and use this for professional communication intervention deployed by an institution to induce change in
voluntary behaviours with a presumed public or collective utility [40]. In 1990s extension concept has been recognized [41] as organized exchange of information and the purposive transfer of skills; Leeuwis and Van Den Ban added that the essence of agricultural extension is to facilitate interplay and nurture synergies within a total information system involving agricultural research, agricultural education within a total information system involving agricultural research, agricultural education and a vast complex of information-providing businesses [42]. In the recent years, the academicians working in this field argued that agricultural extension needs to be reinvented as a professional practice [42] and some have abandoned the idea of extension as a distinct concept, and prefer to think in terms of ‘Knowledge Systems’ in which farmers are seen as experts rather than adopters [43]. It shows how the extension has taken several forms during the evolution process. From a practical point of view, the extension aims to help both farmer and expert by enabling effective information and knowledge transfers to create sustainable forms of agriculture. However the development of extension services in modern era has differed from country to country and sometimes even within the country. This is due to the applicability, effectiveness, and farm families acceptance, which resulted several extension models all over the world.

1.3.2 Existing Extension Models

According to Carl [44], there are six extension models are being used in developing countries, they are
The National Public Extension Model was introduced by U. S. Land Grant System. This is a dominant extension model all over the world, and it has been recognized as a key institution within and reporting to the Ministry of Agriculture. The Land Grant Model discusses the coordination and management of three interlinked institutions: agricultural research, extension and agricultural higher education among responsible institution in the adopted countries. The transaction costs of the Land Grant Model are low.

The Commodity Extension and Research Model was introduced by colonial powers in Malaysia, Mali and other colonies exporting cotton, palm oil etc. The model combines research and extension.

The Training and Visit (T&V) Extension Model was launched in Turkey in the early seventies and then spread to other parts of the world under World Bank sponsorship in the late seventies and the eighties. Though the T&V model has proven to be financially unsustainable [45], some of the countries still use modified T&V extension programs.

The NGO Extension Model was introduced in the nineties, when many NGOs shifted gears and moved from providers of food aid and humanitarian assistance. Eventually the NGOs has become “agents of development”, and started recruiting extension workers, for instance in Mozambique in 2005, the NGOs employed 840 extension workers as compared with 770 public extension workers [46].
The Private Extension Model was introduced in the recent years with an expectation to pay some of the cost of extension with the hope that public outlays on extension will be reduced [47]. However there is little evidence to date that small scale farms can “buy their way out of poverty” by paying for extension advice.

The Farmer Field School (FFS) Model (Approach) emerged in Asia in the 1980s when extension workers offered advice to farmers on using IPM (Integrated Pest Management) to control pests in rice mono-cropping areas in the Philippines and Indonesia [48], [49]. Though there is spirited debate among extension experts whether the FFS is approach or a model, the model proved to be effective in reducing pesticide use by up to 80 percent on farms in these two countries. The FFS model is now being used in around 50 developing countries [44].

Apart from this, other extension models are emerging, in recent years, for enabling information and knowledge transfers among actors of the extension system, for example

The ATMA Extension Model was initiated in late 1990s in India with the World Bank support [50] when the extension specialists realized the need of decentralized national public extension systems. The Agriculture Technology Management Agency Model (ATMA) combines decentralization with a focus on agricultural diversification and increasing farm incomes and employment; and collects feedback from clients to extension specialists, researchers, policy makers and donors. Based on the feedback the decisions on extension are made by a Governing Board with equal representation between (1) the heads of the line departments, including agriculture, animal husbandry, horticulture etc. and key people in the State Department of
Agriculture; (2) research units within the districts and stakeholder representatives and (3) a cross-section of farmers, women, disadvantaged groups and the private sector. The ATMA model became operational in 2001 in 60 districts, and considered a major success in India; plans to extending the model to 600 more districts in India in next five years are under pipeline [51].

**ICT Mediated Agricultural Extension Models** are in experimental phase in many parts of the developing world with new institutional arrangements, public-private partnerships for enabling effective information flows within and between concerned governments, grassroots institutions, scientific institutions, and regional and international organization involved in this field. Many of these models aims to set up decentralized environments (Rural Knowledge Centres) with a centralized knowledge base for enabling information and knowledge transfers among farmers and experts at various levels. Though most of these projects are in pilot mode, there is increased interest in the use of contemporary ICTs for enabling effective information and knowledge transfers in the existing extension approaches. Although there are many extension models are in use, most of these models fall into one of two basic categories:

1. systems of information communication that aim to change the behaviour of rural people
2. systems of information communication that aim to change the knowledge of rural people

There is, of course, a close relationship between knowledge and behaviour; changes in the former often lead to a change in the latter. If government policy-makers, project managers or
researchers direct the topics addressed and projects undertaken, then the purpose of extension is to change behaviour. This approach to extension has been variously described as *directive extension*, social marketing, and propaganda.

If farmers and other rural people direct the extension towards their own needs, then the purpose of extension is changing knowledge. This knowledge helps rural people make their own decisions regarding farming practices. This approach to extension is closely related to *non-formal education*.

**1.3.3 Information Communication Processes within Agricultural Extension System**

The term 'extension' has been used to cover widely differing communication systems. Two particular issues help to define the type of extension: how communication takes place and why it takes place [52].

*How Communication Takes Place: Top-down versus Bottom-up*

Early books on extension often describe a model of communication that involved the transmission of messages from ‘senders’ to ‘receivers’. As part of this model, senders are usually people in authority, such as government planners, researchers, and extension staff, while receivers are usually farmers who are relatively poor and semi-literate (in some cases illiterate). Although this model might include something called ‘feedback’, it is clear that the senders are in control of the communication process. The transmission model of communication is closely
related to the idea that extension workers are the link (i.e. message carriers) between researchers (senders) and farmers (receivers). Extension programmes based on this model have been described as ‘top-down’ approach; the actors in the communication process have a parent/child or teacher/student relationship.

In many developing countries, in recent years, top-down extension is gradually being replaced by more participatory approaches, in which the knowledge and opinions of farmers is considered to be just as important as that of researchers or government officials. Participatory approaches involve information-sharing and joint decision-making. Extension programmes based on this approach have been described as ‘bottom-up’ approach; the actors in the communication process have an interactive approach.

The development of participatory extension requires a re-examination of the communication process. At present, no single description has replaced the transmission model that is referred to above, but two ideas are becoming widely accepted:

1. Communication in the context of participatory extension cannot usefully be described in a linear manner with distinct groups of senders and receivers. Instead, extension activities take place within a knowledge system consisting of many actors who play different roles at different times.

2. Although some actors in the knowledge system have more authority than others, communication usually involves a negotiation rather than a transmission. What takes
place is a dialogue, with actors collaborating in the construction of shared meanings rather than simply exchanging information.

It was therefore, use of contemporary ICT tools to develop an information transmission model with a combination of top-down and bottom up approach with a community mobilization has been included as one of the components of micro-level drought preparedness framework.

1.4 Rural Knowledge Centres as Facilitation Nodes in Expert-Farmer Information Exchange

The emerging opportunities, in recent years, such as pluralistic institutional arrangements and contemporary ICTs are finding wider acceptance in rural information exchange. This is mainly because developing countries have realized the need for effective information and knowledge exchange among various sectors to engage in a wider range of issues beyond merely disseminating production-oriented technologies. Extension pluralism is at the core of information exchange and farmer adaptation strategies and ICT’s can offer new advantages in enabling reliable and rapid access to expert information support, which is much needed in the realization of adaptation (or) preparedness strategies on a large scale. Swaminathan [53], Zijp [54], Balaji et al., [55], Dileepkumar and Balaji [56] explained the use of ICTs in the process of transferring technology packages to knowledge or information packages. ICTs, in this context, is an umbrella term that includes computer hardware and software; digital broadcast and telecommunications technologies as well as digital information repositories online or offline [57] and includes the contemporary social networking aspects, read/write interfaces on the web
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besides file sharing systems online. It represents a broad and continually evolving range of elements that further includes television (TV), radio, mobile phones, and the policies and laws that govern these media and devices. The term is often used in plural (ICTs) to mean a range of technologies instead of a single technology [14].

A number of pilot Rural Knowledge Centre (more popularly known as telecentres) projects in applying ICTs in rural development are in progress in many parts of the world [58]. According to Gomez et al., [59] telecentres are in different names, as per the public ICT access, varying in the clientele they serve, the services they provide, as well as their business or organizational model. Around the world, some telecentres include NGO-sponsored, local government, commercial, school-based, and university-related, and in some cases the internet access in public libraries. Each type has advantages and disadvantages when considering attempts to link communities with ICTs and to bridge the digital divide. Sood [60] considers telecentres as the rural computer centers and he categorises rural computer centers into four types:

**Cybercafe**, which operate as Internet café in rural areas without any direct link to government programmes or programmes of developmental organizations

**Monologic Kiosk** offers only one kind of service and one kind of transaction pattern to specific group of people

**Information Kiosk** offers wide varieties of service to different groups within a community including e-governance service
Telecentres are related to the activities of Non Governmental Organizations (NGOs) and other development agencies providing basic communication services and educational services.

However Sood had left out an important category. This fifth category is the knowledge centre. Knowledge Centres are centres for facilitating the information and knowledge management of a community in which community and organizations at local, meso and macro level interact for information and knowledge management, which would ensure livelihood security in the community. Many NGOs and international agencies, in recent years, made an attempt to use these new institutional arrangements to develop drought preparedness mechanism combined with the information services to support rural farm families. However the applications of knowledge centres in rural areas and ICTs in the context of drought preparedness are far from clear until recent years. This research work therefore includes an assessment of selected RKC project sites to understand various dimensions and dynamics involved in setting up of ICT enabled RKCs and their effective utilization in information management in general and to foster drought preparedness in particular.

1.5 Rural Knowledge Centres as Facilitators of New Learning Opportunities

Capability building and capacity development of rural stakeholders is a key component of the new framework on drought preparedness. However, given that most stakeholders have limited exposure to the classroom milieu, new methods and techniques for capacity development will be necessary in fostering drought preparedness.
In the past, capacity building at many national and international institutions has been conducted through residential, face-to-face mass training and education. This approach, although effective, is costly and has limited reach. Conventional approaches to training and education have not sufficiently met the demand of the rural stakeholders. The new approach to the capacity building envisions a world in which all stakeholders can easily access and share information, knowledge and skills they need – anywhere and anytime – in a cost effective manner.

The contemporary situation demands more innovative and efficient access to appropriate information, knowledge, and skills. This has led to increased interest in harnessing new tools and concepts in learning, information and ICTs and knowledge management to complement and supplement its present capacity building initiatives. Open and Distance Learning (ODL), in recent years, has been identified as one of the most powerful new forces influencing the direction of capacity building either through supply of distance learning technology or the demand for courses by society [61].

1.5.1 Open and Distance Learning

According to Commonwealth of Learning (COL), the term open and distance learning and its definition are relatively new in the field of education, having gained prominence only in the past 15 to 20 years. The language and terms used to describe distance learning activities can still be confusing, and geographical differences in usage. Among more commonly used terms related to open and distance learning are: correspondence education, home study, independent study, external studies, continuing education, distance teaching, self-instruction, adult education,
technology-based or mediated education, learner-centred education, open learning, open access, flexible learning and distributed learning. Advances in ODL methods and contemporary ICTs in recent years helping educational organizations and training institutions to strengthen their approach by offering online and web-based courses, and practicing new generation ODL methodologies i.e., asynchronous (Internet education portals, web based learning management systems, Forums, and wiki’s to name a few) and synchronous (Chat, Flash meetings, Breeze meeting, Teleconferencing and Video Conferencing to name a few) learning methods.

The distance education workers invented several theories and models, Desmond Keegan's theory, the Norwegian Model to name a few, for successful implementation of distance learning, where as some workers explained about the concepts of existing systems in their studies such as the United Kingdom’s University, Vancouver's Open Learning Agency, Norway's NKS and NKI Distance Education organizations, Florida's Nova University, the University of South Africa distance learning program, the Televised Japanese Language Program at North Carolina State University [62], US. Federal government’s Star Schools Program, and India’s IGNOU distance learning programmes. Some workers made an attempt to look at the design considerations of distance learning programmes includes interactivity [63], [64], [65], Active learning [66], Visual Imagery [67], [68], Effective communication [69], [70], where as some discussed about the challenges of methods and strategies of distance learning programmes such as implementation strategies [71], [72], media based challenges [62], [73], [71], [64], [72], partnerships and teamwork [74], [75]; operational issues includes teacher-facilitator-learners triad [76], [77], [72], technology adoption [78], [79]; and management and policy issues [79], [77]. To give
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experience as much like traditional, face-to-face instruction, via interact classrooms and live two
way audio-visual interaction are emerging ODL opportunities; and virtual learning communities,
virtual academies are recent trends in the distance learning programmes. Restructuring distance
education to include strategic management; creating learner centric, cost-effective, value-driven,
high-quality services for the distance learning community; and repurposing electronic distance
learning materials have been noted in the recent years as challenges of open distance learning
programmes. In this research work an attempt has been made to resolve some of these issues by
proposing needed arrangements for ICT enabled distance learning methods and conceptual
frameworks for repurposing the content in a cost effective manner.

Combining the potential of ODL, and ICTs have been practiced by a small number of national
and international agencies with an aim to build capacities and communicate information and
knowledge related to drought, climate management and livelihood opportunities to mobilize the
stakeholders in the drought prone regions; this is ultimately aimed at empowering vulnerable
people to make better choices and have better control of their own development, particularly
during emergencies. However, as on the date, most of these approaches, innovations, tools,
concepts and technologies are much accessible to urban folk, none (or) very few of these
technologies are accessible to rural communities that to not for education, training (or) learning
purposes. A few organizations, namely VASAT project of ICRISAT, National Virtual
Academy in India made an attempt to use ODL approaches to foster drought preparedness; these
are routed through RKCs. However there are few studies so far that have discussed the
arrangements for the effective implementation of rural capacity building programmes in the
context of drought preparedness. It was therefore this has been included as one of the components of micro-level drought preparedness framework. In this study an attempt has been made to discuss the needed arrangements based on the experiences from the existing open distance learning programmes; and to derive methods and approaches based on the results of ODL experiments conducted through RKCs (as facilitating agencies in rural areas) to improve the coping capacities of rural farm families.

1.6 Motivation

Although drought causes serious economic and social impacts, the efforts have been taken for generating micro-level drought assessment and preparedness is least understood until recent years. For instance, in India, in most of the cases, the declaration of drought or as a scarcity affected area for providing relief to the population is still done by the Revenue Department of the state government, on the basis of estimation of the prospective harvest. The Indian Meteorological department is the authorized agency to generate drought predictions at country level. However, these predictions wouldn’t be useful for preparing the farm communities at local level against drought and disasters. Moreover insufficient drought coping mechanisms and existing support systems at micro-local for high risk associated with low investment capacity of farmers often results in higher rate of out migration, food insecurity and poverty; in some cases, in recent years, the farmers’ suicides have become one of the drought coping mechanisms. The emerging opportunities such as contemporary ICTs and pluralistic institutional arrangements have not been used effectively to develop drought assessment and support systems at local level. With this realization, the established practices such as Sources of Agricultural Information
management (International/National/Extra-Institutional), ICT enabled RKC, Open and Distance Learning Methods, micro-level drought assessment and early Warnings have been identified as key components in developing a framework for micro-level drought preparedness. These components were considered as the objectives of this research study, and conducted series of studies and experiments to understand the existing approaches and needed arrangements in defining and developing proposed framework.

1.7 Objectives

The proposed research work was conducted at ICRISAT – Knowledge Management and Sharing department with following objectives.

- Assess selected RKC project sites to understand the way ICT’s in development can be deployed in support of drought preparedness, and to propose a framework to deploy them.
- Propose and test an arrangement for information exchange and rural capacity building with RKCs and contemporary ICT tools to foster drought preparedness; and propose a framework for repurposing electronic learning content and its management.
- Test an ICT mediated framework to generate community level early warning mechanisms to improve micro-level drought preparedness.
- Develop an integrated framework to improve micro-level drought preparedness with information management at its core.
A series of experiments had been conducted with the financial support of the VASAT program to develop proposed framework to improve micro-level drought preparedness among vulnerable rural families with information management and rural knowledge centres.