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Role of Telecentres as Knowledge Networks: Successes and Challenges

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Information and Communications Technology and
Disaster Risk Reduction Division

**Role of Telecentres as Knowledge Networks:
Successes and Challenges**

Prepared by Rajindra Ariyabandu*

Authorized for distribution by Xuan Zengpei

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Abstract

The conventional telecentres are transforming into knowledge networks with knowledge hubs as the intermediary. Knowledge hubs consist of other knowledge functions like, education, employment, agriculture and health besides providing conventional ICT facilities to bridge the digital divide. Many of the value added services have empowered rural community to access information and knowledge to improve livelihoods and attain sustainable development. Besides new information sources, the transformation has also embarked on new partnerships, governance structures, participation and business plans. These changes have been able to capture the fragmented and inadequately utilized knowledge within the communities to strengthen knowledge networks.

The process from telecentres to knowledge hubs has facilitated not only bridging the digital divide but also the economic, social and gender divide which are polarizing the society.

The Paper emphasizes the importance of telecentres in the continuum and supports the theory that sustainability of telecentres and knowledge networks are equally important for sustainable development.

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* Mr Rajindra Ariyabandu, Economic Affairs Officer, Information and Communication Technology and Disaster Risk Reduction Division, United Nations ESCAP, United Nations Building, Rajdamnern Nok Avenue, Bangkok 10200, Thailand. E-Mail address: escap-idd@un.org

EXECUTIVE SUMMARY

The world has witnessed a phenomenal rise in information and communication technology (ICT) over the past two decades. Many different technologies have been used to generate and share information leading to enhanced knowledge and empowerment of people. The challenge posed to the World Summit on the Information Society (WSIS) is to harness the potential of information and communication technology to promote the development goals of the Millennium Declaration. Similarly, WSIS endeavours to overcome the digital divide by connecting rural village through ICT technologies.

The role of the conventional telecentres is transforming to more development oriented knowledge networks. Knowledge hubs are the intermediaries between the telecentres and knowledge networks in the transformation process. Knowledge hubs constitute of many other knowledge functions like, education, employment, agriculture and health besides providing conventional ICT facilities to bridge the digital divide. Many of the value added services have empowered rural community to access information and knowledge to improve livelihoods and attain sustainable development. Besides new information sources, the transformation process has also endured on new partnerships, governance structures, participation and business plans. These changes have captured the fragmented and inadequately utilized knowledge to strengthen knowledge networks.

The process from telecentres to knowledge hubs has facilitated not only bridging the digital divide but also the economic, social and gender divide which are polarizing the society. However, future sustainability of these interventions depends on establishing sustainable knowledge networks and affordable business plans. Besides, the new plans will have to consider including the poorest of the poor who are marginalized in the current transformation process.

This paper attempts to present the process of transformation from telecentres to knowledge hubs and the role of knowledge networks. It emphasizes the importance of telecentres in the continuum and supports the theory that sustainability of telecentres and knowledge networks are equally important. It highlights the role of knowledge hubs in empowering rural communities and challenges faced in maintaining the role of rural empowerment. Finally, recognizing the future role of knowledge networks, it presents some suggestions for ESCAP to facilitate the process of transformation leading to sustainable development.

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A. Introduction

The vision and the guiding principles of the World Summit on the Information Society (WSIS 2003a) envisage promoting the use of ICT-based products, networks, services and applications and to help countries overcome the digital divide. Connecting villages with ICT and establishing community access points were among the indicative targets of the Plan of Action adapted by WSIS to improve connectivity and access to ICT by 2015 (WSIS 2003b).

Establishing sustainable multi-purpose community public access points is specifically covered under WSIS action plan. It stipulates that individuals, organizations and communities should benefit from having access to information and knowledge from these access points. In order to achieve the benefits, governments and other stakeholders should establish sustainable multi-purpose community access points, providing various communication resources including Internet to their citizens at affordable costs or free of charge (Hajela 2009).

On the Origin of the community access points, (telecentres) dates back to 1980s, when the first telecottages were established in Scandinavia and Community Technology Centers (CTC) in the United States of America. With the advancement in technology, personal computers gradually came to be a household item. Hence, public access to computers became only an alternative solution. However, in spite of the development in computer technology and increased ability to own personal computers, public access to computers still remains in significant in many developing countries. In many rural and remote areas in developing countries, community access points are the only source to ensure access to ICT for everyone. Over the past two decades ICT access points have proliferated in many developing nations with the support of governments, donor agencies, non-governmental organizations (NGOs) and commercial enterprises.

However, the current challenge is to further develop these community access points into sustainable “knowledge centres” with the involvement of government, NGOs and other stakeholders. Although the community access points have been in existence for many years in the development domain, knowledge appears to be still fragmented and underutilized for sustainable development. Numerous stand alone ICT access points have not been able to adequately share information and experience, especially among the poor and the disadvantage communities. This has reduced the demand and sustainability of ICT access points to continue serving the poor. Establishing knowledge networks through scattered community access points may offer a solution to collate fragmented and inadequately utilized knowledge to improve the efficacy of ICT access points (telecentres) and promote sustainable development. This will also support goal 8 of the Millennium Development Goals (MDGs), which stipulates to “develop a global partnership for development” which includes “accelerated transfer of technology and improved employment opportunities for the growing ranks of younger people in developing world” besides accomplishing target 7, “to make available the benefits of new technologies, especially, information and communication in cooperation with the private sector”

In the recent past, networks have become popular among donors and practitioners alike. Networks have been used to deliver development aid and promote civil society and values. But networks have also been used as the means to generate and learn new knowledge and share knowledge among a larger membership. Essentially, the telecentres are expected to be further

developed or transformed into community knowledge hubs, initially, and networked into local/regional knowledge network(s). In the process of transformation each telecentre will function as an information node in the network while continue to operate according to a flexible structure to generate and share information. In the process, telecentres are re-conceived as service and community development hubs, as well as centres for sharing business information providing a sustainable source of revenue, thus, extending the original model beyond focusing only on access to ICT. This paper discusses the efforts made in the Asia pacific member states with respect to transforming telecentres into knowledge hubs. While there is no blue print model to transformation, different approaches have resulted in achieving varying degrees of success. The paper explicitly looks at different methods adopted by key stakeholders and attempts to highlight some of the key features for establishing knowledge hubs and knowledge networks.

The current research is based on secondary information from ESCAP project on “Knowledge Networks through ICT Access Points for Disadvantage Communities” papers presented in meetings and seminars on knowledge networks, Internet research and discussions with colleagues and peers.

Findings of this paper may be used as a guide to establishing knowledge networks in the Asia and Pacific region. However, it is desirable to assess some of the findings of this paper with primary sources before considering for implementation.

B. Concept of telecentres

Access to information has the potential to bring about the necessary social and economic change in a society. Nevertheless, information evolution often results in greater socio-economic inequity in society due to differential access to computers and Internet. Thus, the digital divide may be overcome in the long term by providing access to public information systems through telecentres. (Rogers and Shukla 2001). Telecentres are characterized by shared facilities for people who can not individually afford them because they are too expensive and/or too complicated to use. The globally accepted concept for sustainability of telecentres appears to be that the users should share the cost of telecom infrastructure and local facilities to provide a service to the community at an affordable cost and become commercially viable.¹

Therefore, the strategy should be to encourage telecentres to narrow the digital divide. Telecentres provide public as opposed to private access to Internet and computers. This has allowed better access to information and knowledge to remote and rural areas. Conceptually, telecentres should be accessible and affordable to those who are marginalized and unable to afford the facility individually. At present the differential adoption of the Internet facility has created a digital divide within nations and between the developed and developing nations. Provision of telecentres is expected to bridge this gap. However, only a fraction of the poor have access to telecentres in the efforts to reduce the digital divide (ibid.). According to the International Telecommunication Union (ITU), the magnitude of the digital divide has remained unchanged from 2002 to 2007, in spite of significant improvement in ICT development among the developing nations (ITU 2009).

¹ This is a highly debatable issue. It is not clear whether all telecentres should be commercially oriented or only certain models of telecentres qualify to be commercial enterprises.

C. The problem

Although telecentres were established to improve access to information to the poor and the disadvantage, many appear to be marginalized with respect to information and knowledge. The cause for poor informatization is in the process of information and knowledge transfer. There is a vast ambit of knowledge which lies outside the radius of telecentres. Knowledge is fragmented and underutilized. This needs to be harnessed to sustain telecentres and social development through the use of community access points. Knowledge transfer is a two way process. While the telecentres were expected to generate and share new knowledge through global and local networks, they are also expected to harness local and traditional knowledge to add value to knowledge networks.

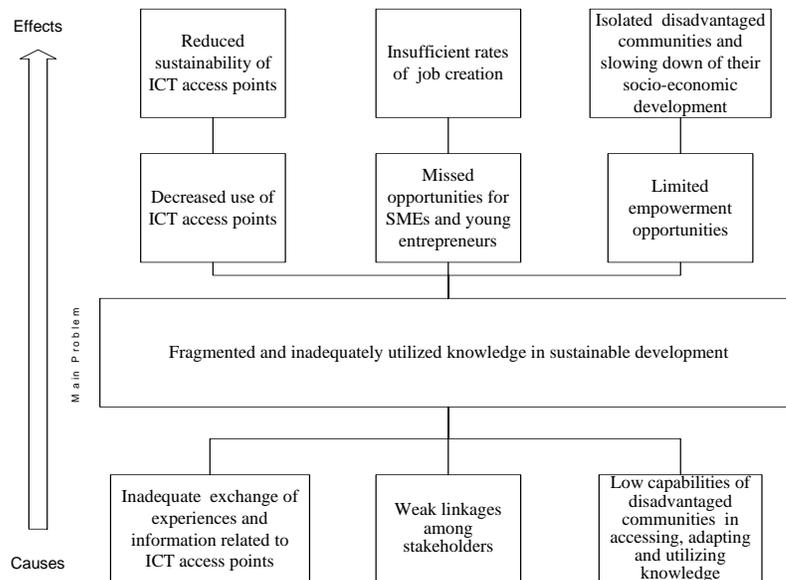
Problem analysis indicates to three main causes for fragmentation and underutilization of knowledge:

- Inadequate exchange of information and experience;
- Weak linkages with stakeholders;
- Limited empowerment of the poor leading to low capability of communities in accessing, adapting and utilizing knowledge.

These drawbacks have resulted in multiplier effects on poor communities (figure 1). Two of the important effects due to the above causes are:

- Reduced sustainability of ICT access points;
- Isolation of poor and disadvantages communities and decrease in socio-economic development.

Figure 1: Cause and effects of fragmented and inadequately utilized knowledge



Source: Project document on “Knowledge Networks through ICT Access Points for Disadvantaged Communities”

In order to expedite the information flow among stakeholders and improve knowledge, “knowledge networks” though telecentres are ideally positioned to facilitate a value added process of information exchange. The process of information and experience exchange is expected to benefit the poor and the disadvantaged particularly, and contribute towards sustainable development.

D. Definition

A telecentre is a mechanism which uses ICT to support a community’s economic, social and educational development, reduce isolation, bridging the digital divide, promoting health issue and empower women etc. Public ICT access points (telecentres) are diverse, varying in the clientele they serve, the services they provide as well as their business and operational models. Telecentre is a generic term which has acquired variety of names depending on the type of use. They could range from, *Multipurpose Community Telecentres*, *Community Tele Services Centres*, *Community Information Centres*, *Telekiosk*, *Telecottages*, etc. The different terminology is used in different countries but to mean the same functional abilities.

Various scholars have defined telecentres in different ways:

- “A telecentre is a shared facility that provides public access to information and communication technologies” (Colle and Roman 1999);
- “A telecentre is a place where public access to communication and information for economic, social and cultural development is provided through IT” (Fuchs 1997);
- “A telecentre provides information and communication services needed by the local community” (Cisler 1998).

E. Understanding of knowledge networks

Telecentres basically represent community access points where people can have access to conventional ICT tools like, a telephone, computer and Internet (if adequate bandwidth can be provided). When telecentres are subjected to value addition with knowledge, training, services along with the basic parameters, it represents a “knowledge hub”. A conventional “knowledge hub” is a vibrant centre which is accessible to communities to gain, share and organize knowledge depending on their needs and environment. A “Knowledge hub” also acts as an intermediary station between the community and knowledge network. Knowledge hubs can localize knowledge gained from peer ICT access points in other regions and serve the community. They will also contribute to creating knowledge by providing experience gained from the local communities to the benefit of the global networks at large (ESCAP 2006).

The knowledge hubs are connected to knowledge networks depending on the level and area of coverage. Accordingly, they can be connected to regional networks or global networks dealing with sustainable development.

A ‘knowledge network’ can be defined as a knowledge hub for business, public sector organizations, communities and individuals, bringing together people and new ideas to foster exploitation of knowledge for the benefit of all (University of Westminster undated) or it can be

also defined as “a group of expert institutions working together on a common concern, to strengthen each others research and communication capacity, to share knowledge bases and develop solutions that meet the needs of target decision-makers at the national and international levels” (Creech and Willard 2001).

Knowledge is the most important factor in economic development of livelihoods. In the current era ‘knowledge’ is not hoarded because it gives ‘power’ but ‘shared’, so that it will multiply among a large community.

F. Transforming telecentres to knowledge networks

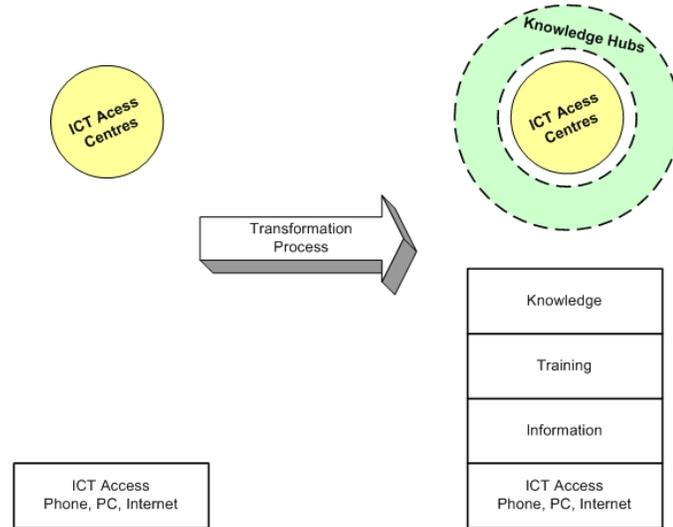
The initial telecentres introduced in mid 1990s were conventional access points. In order to be sustainable these access points had to be transformed into knowledge hubs. A knowledge hub is defined as a vibrant centre regularly accessed by the community for their development and livelihood needs. Transforming ICT access points to knowledge hubs involves, revitalizing ICT access points, developing new functions, connecting to global networks and activating partnerships. Ideally, satisfying of all these functions will transform ICT access points into knowledge hubs which could then be followed by connecting to knowledge networks. However, in the current context many telecentres have not satisfied all these functions but they are in the process of meeting few or all of the functions. The degree of transformation depends on many factors like, financial resources, political commitment and community participation. One of the key criteria in the process of transformation is developing a good business plan. In order to be sustainable, knowledge hubs need to generate revenue with full community participation.

Due to varying degree of success, not all telecentres can be transformed into knowledge hubs. Some of the basic criteria for establishing knowledge hubs are; number of existing telecentres in a country or location, size of the target group, number of knowledge hubs relative to the poverty situation in the country etc (ESCAP 2006) While all these functions and conditions are important for establishing knowledge hubs, participation of the government, local authorities, NGOs and local communities are essential for the sustainability of the transformation process.

The transformation process from telecentres to knowledge hubs is indicated in figure 2. In this process, the ICT access points with access to phones, computers and Internet are value added with knowledge, information, training and services. Many telecentres currently functioning in developing countries have successfully incorporated knowledge and information into there area of operations.

A study conducted by ESCAP, “Assessment of the status of the implementation and use of ICT access points in Asia and pacific” identified potential telcentres to be transformed into knowledge hubs (table 1). These telecentres have established necessary infrastructure and processes to facilitate creation and dissemination of development related information and promote active community participation. These telecentres could generate and disseminate information while benefiting from information generated by other telecentres in the region. Thus, they may qualify to be knowledge hubs in a potential knowledge network of telecentres.

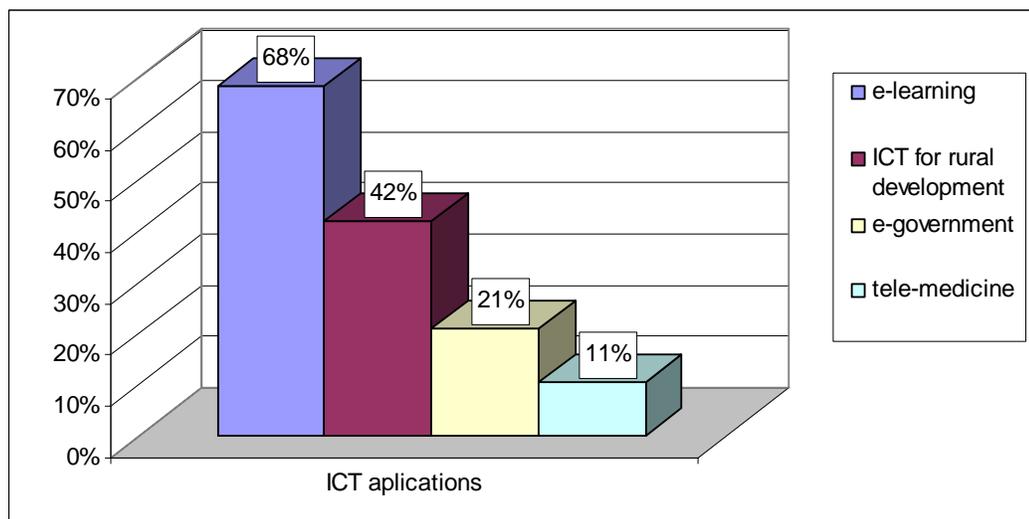
Figure 2: Transformation process from telecentres to knowledge hubs



Source: Project document on “Knowledge Networks through ICT Access Points for Disadvantaged Communities”.

Among many facets of knowledge, telecentre knowledge hubs have been successful in disseminating e-learning applications, mainly e-literacy (68 per cent) followed by ICT applications for development (rural marketing information, procurement and employment information), e-governance and e-medicine (figure 3). Although these observations were made in a study conducted by ESCAP in 2007, the trend in knowledge dissemination is very much the same among many other telecentre knowledge hubs elsewhere.

Figure 3: Telecentre projects by ICT applications

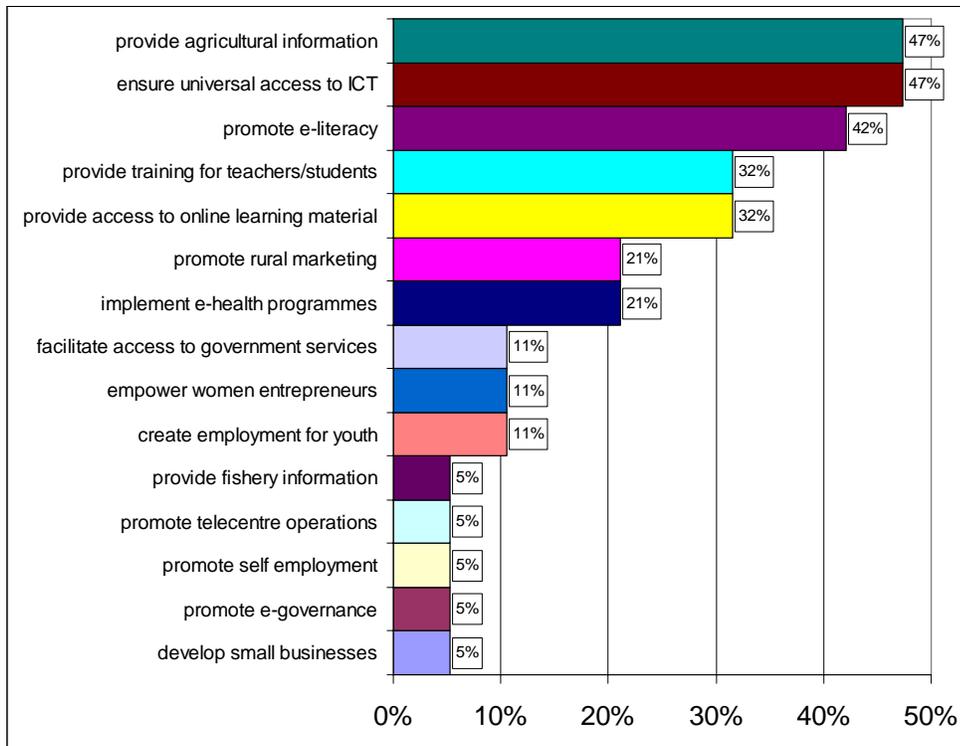


Source: ESCAP 2007

Disaggregating the information further by area of intervention, indicates that access to agricultural information and access to ICT (e-literacy) uses are the most important benefits for

users. This is followed by three categories of e-learning, followed by other categories of marketing, e-health, e-government and empowerment of women (figure 4).

Figure 4: Distribution of telecentre projects by area of intervention



Source: ESCAP 2007

According to table 4, agriculture information and e-literacy are the two functions which have the best potential to be functional networks. The telecentre initiatives highlighted in table 2 are those which have established infrastructure for dissemination of agriculture related information. These can be potential knowledge hubs in the proposed knowledge network on agriculture and marketing.

Table 1: Potential knowledge hubs in Asian and the Pacific region

Name of Project	Country	Number of telecentres
e-Choupal	India	6500
n-Logue - Sustainable Access in Rural India (SARI)	India	1434
Akshaya - Community Technology Centers	India	630
TARahaat	India	196
Agricultural Technology 110 (NJ110)	China	139
ITU/UPU/BT e-Post Project	Bhutan	92
Coca-Cola Learning Centres	Viet Nam	47
Poverty Alleviation through Science & Technology	China	36
Shiksha Gyandoot	India	34
Gyandoot	India	31
Relief International - Schools Online (RI-SOL)	Bangladesh	27

Name of Project	Country	Number of telecentres
Community Information Centers Project	Cambodia	22
Amader Gram Knowledge Center - ICT initiative	Bangladesh	20
iKisan	India	18
Cyber Extension	India	10
Village Knowledge Centres	India	10
Virtual Village (based upon Savordaya Telecentre)	Sri Lanka	6
Pallitathya Kendra (Rural Information Centre)	Bangladesh	4
Jhuwani Library (OKN) project	Nepal	1

Source: ESCAP 2007

Table 2: Potential knowledge hubs in proposed network in agricultural information

Name		Country
1	Microsoft CIC Project	Bhutan
2	Community Information Center (Tangmachu)	Bhutan
3	Agricultural Technology 110 (NJ110)	China
4	Poverty Alleviation through Science & Technology	China
5	Cyber Extension	India
6	e-Choupal	India
7	Gyandoot	India
8	IT Kiosks in Orissa	India
9	Warna Wired Villages	India
10	TARahaat	India
11	Village Knowledge Centres	India
12	iKisan	India
13	CIC of Syangja	Nepal
14	Savordaya Telecentre & Distance e-Learning (DeL)	Sri Lanka
15	Virtual Village (based upon Savordaya Telecentre)	Sri Lanka
16	The Lighthouse Project	Thailand

Source: ESCAP 2007

1. Improving livelihoods through information and knowledge

As mentioned earlier many telecentres have progressed beyond ICT access points to form knowledge hubs. The e-Choupal initiative in India is a classic case of a successful knowledge hub which offers many benefits to its members. Primarily, e-Choupal was expected to provide agricultural marketing information to farmers to make an informed choice. With the information farmers could decide on product sale prices and make a better income. Farmers pay a commission to the e-Choupal operator and the operator is also bestowed with increased prestige for his services. This initiative marginalizes the intermediaries in agriculture product marketing chain and farmers make a better income thus improving quality of Indian agriculture. Besides agriculture information, e-Choupal also links farmers with their relatives else where in the world. They trade with international trade organizations to track market prices and offer school children the opportunity to use computer facilities for studies. This has resulted in a significant step towards rural development.

The Sustainable Access in Rural India (SARI) in Tamil Nadu, India is another initiative where they provide agriculture, veterinary, health, e-governance besides, computer literacy, web browsing, e-mail/voice mail services to the community at large. They also provide a service to send petitions to the government seeking redress from official irregularities. All these services are charged on the basis of full cost recovery (ESCAP 2007).

There are number of such initiatives where rural communities have benefited by faster and easier communication. This has created a greater participation of people from all walks of life. In many cases people were willing to pay for new information and knowledge. However, financial sustainability and affordability of some of the telecentre services are a major concern for poorer households in many rural communities.

2. Use of terminology, community access points versus knowledge hubs

Although there is a distinct difference between telecentres (community access points) and knowledge hubs, it is difficult to differentiate the demarcation in the transformation process. Different countries use different terminology to denote community access points. In Bhutan they are called Community Information Centers (CIC); in Pakistan, Point of Presence of ICT (POPs); in Sri Lanka, Nanasala (knowledge centers); in Nepal, telecentre/CIC; in Malaysia, telecentres; in Mongolia, knowledge transfer hubs (public libraries, public information centres, project based Internet centres and cyber cafes). These names are loosely used to mean both telecentres and knowledge hubs.

Although telecentres are only expected to provide basic facilities like phone and Internet, many telecentres currently provide other services besides conventional ICT facilities. Many of the current telecentres have at least one value addition, thus, leading the way to be a knowledge hub. In Malaysia, though they call community access points as telecentres, they possess equipments for creating and sharing information, e-development programmes, e-business transactions, e-agriculture portals and multi stakeholder partnerships. All these functions constitute a well established knowledge hub. On the other hand, Nepal has established telecentres and is currently attempting to explore possibilities of providing better service delivery in health, education, agriculture and policy. On the contrary, in Bhutan, the community information centers (CICs) provide all the basic ICT facilities and other non computer based e-services like fax, printing, photocopy, lamination. They hope to provide telemedicine, e-governance and e-education but these access points are called CICs. Thus, there is no clear distinction in terms of the name. Many telecentres in the current context function more like knowledge hubs from the inception.

3. Partnerships

Success of knowledge hubs do not necessarily depend only on information generated alone. Information has to be solicited from many other sources. These sources can be government bodies, private parties or NGOs. Which ever the source may be, it is essential that knowledge hubs establish fictional partnerships with these agencies to obtain information required by the users. In one of the telecentre projects in India, knowledge hubs were able to obtain agriculture and veterinary information from government universities through partnerships established with these institutions. Similarly, partnerships developed with government and private institutions

were able to deliver a wide range of health services including general health check ups, maternal and child care. Partnership with agriculture marketing services is another useful venture in which knowledge hubs could play an important role. Establishing partnership with farmers' associations is an important means to disseminate and receive knowledge and information from farmers. Therefore partnerships can play a vital role in sustaining knowledge hubs while it enriches knowledge networks with new knowledge and information.

G. Role of knowledge networks

One of the main objectives in the process of transformation from telecentres is to establish regional and/or global knowledge networks in selected areas depending on the priority for rural and disadvantage communities. Some of the priority areas could be employment, education, agriculture, health and gender. It is inevitable that sharing knowledge is unattainable without establishing knowledge networks. The level of establishing knowledge network will depend largely on the demand of the users. As many telecentres were established to serve the needs of rural communities, local or national knowledge networks could be an appropriate starting point. Subsequently, depending on the demand, these networks could be extended to regional or global networks. The telecentre knowledge hubs can function as the nodes of knowledge networks. However, the knowledge hubs should have the flexibility to function independently while contributing to the knowledge network as appropriate.

H. Types and functions of telecentre networks

Following account describes types and functioning of telecentre networks at different levels of governance.

1. Regional networks

The Asia-Pacific Telecentre Network (APTN) is a collaborative initiative of telecentre.org and the United Nations' Economic and Social Commission for the Asia and Pacific (ESCAP). The network is expected to promote innovative knowledge sharing models among the telecentre organizations in the Asian and Pacific region where telecentres are growing exponentially. The Information and Communication Technology Agency (ICTA) in Colombo, Sri Lanka acts as the secretariat for the network.

APTN is a voluntary mechanism of networks of telecentres operating in countries in the Asian and Pacific region. It has the objective to promote the interest of the telecentre movement throughout the region, and to strengthen the capacity of telecentres to provide, develop, Organize, share and disseminate knowledge for the sustainable development of marginalised communities.

The Network aims at synergising the various initiatives being carried out by various institutions. There are several modalities which would be useful to develop:

- **Advocacy** - providing a forum for identifying common issues and views, and promoting sustainable telecentres;

- **Training** - sharing experiences, skills and expertise, identifying new or re-usable solutions for common problems, sharing researches on telecentre implementation - lessons learnt and best practices, and sharing knowledge on methodologies and tools used for telecentre assessment and evaluation;
- **Collective action** - producing products collaboratively and pooling resources and creating synergies.

(Freire and Breard 2008)

Most recently the Central Asia Tele-centre Network has been launched and it is named as the EuroAsian Tele-center Network since there are European member States as well in the network.

2. National networks

The Bangladesh telecentre network (BTN), a coalition of 22 organizations at national level has built a country wide system of information and knowledge for the poor. BTN is based on the ideal of maximizing the advantage of ICT through sharing experience and knowledge within the components of the organization (Raihan 2007). Success of BTN was attributed to its clear vision and the mission to promote rural Bangladesh as a viable information society. BTN envisions “an inclusive knowledge society in Bangladesh, where the poor and the marginalized people get access to information and knowledge to improve their livelihoods through the use of modern ICTs”.

In India the “Mission 2007”, expected to establish ICT based knowledge systems for rural India with a multi-stakeholder approach (ibid.). This programme envisaged to make every village a knowledge centre and hoped to establish ‘village resource centres’ at block level in collaboration with the Indian Space Research Organisation (ISRO). In support of these interventions, the Ministry of Panchayat Raj in 2007, established Internet connected ICT centres in all the 240,000 panchayats and local bodies. This provided a public space for village knowledge centres (VKC) characterized by access to all sections of rural society. These efforts along with other initiatives like 100,000 ICT-based community service centres by the Department of Information Technology and the broadband connectivity to remote villages by the State Wide Area Networks (SWAN) infrastructure are supporting a massive network of telecentres in India.

3. Small scale national level networks

The ‘Nanasala’² programme in Sri Lanka is a small scale national telecentre network compared to other similar initiatives in India and Bangladesh. It started with an initial estimate of establishing 100 ‘nanasalas’ in 100 Grama Niladhari (village headman’s) divisions in three provinces but later revised to 1000 ‘nanasalas’ throughout the country by 2008 (ICTA 2008). The programme initiated four types of telecentre networks, namely, i) rural knowledge centres; ii) e-libraries; iii) distance and e-learning centres (DeL centres); and iv) tsunami camp computer kiosks (ICTA 2005). The different type of networks attempted to cater to the demand of multiple community groups. The e-libraries targeted adults with diverse cultural interests, while tsunami

² Means ‘knowledge centre’ a programme initiated by the e-Sri Lanka Initiative.

camps targeted displaced vulnerable communities. On the other hand, DeL centres attempted to capture the interest of urban community through advance ICT applications, while less sophisticated ICT applications were targeted at rural communities. Although the four types of telecentres exist separately, these efforts combined to provide a concerted network to enhanced ICT accessibility and to build capacity of the public at large (Liyanage 2007).

4. Local level networks

Telecentre networks also exist at local level. The Sarvodaya Multipurpose Community Telecentre network programme in Sri Lanka is one such example. Currently it has 31 telecentres and 177 village information centres (VICs). Essentially VICs are equipment free information centres located in very remote rural villages. The Telecentres acts as the ICT information hubs for several hundreds of Sarvodaya villages. Telecentres feed information to VICs on demand, while the CBOs (community based organizations) managing VICs are given a comprehensive training on ICT to liaise between telecentres and the VICs to provide information to the users.

5. Networks for empowerment of people with disabilities

There are a number of examples from across the world how telecentre networks have been beneficial to the people with disabilities. In Salamieh in Syria, the Salamieh telecentre network has introduced various disability friendly ICT tools and initiatives which are making a difference to the lives of people with disabilities. In Sudan similar efforts are being made by Gedaref Digital City organization (GDCO) to train disable people to use ICT applications. These empowered people are making an impact with their skills thus showcasing the effects of ICTs, especially among those who have speech impairment. The Media Lab Asia, in collaboration with Rehabilitation Council of India (RCI) has developed a comprehensive interactive disability portal. The portal contains information on disability assistance (texts and audio files), special schools, NGOs and special educators and all government policies and circulars related to disable people. When this portal is adopted by telecentre networks it will be easier for people with disability to get access to vital information to improve their livelihoods. There are other initiatives like Shruti-Drishti project which is designed to enable the visually impaired to access electronic documentation in speech and Braille (Chittoor and Kashyap 2009).

I. Community networking (national experiences)

Knowledge networking is one of the fundamental objectives of establishing telecentres. Several countries have taken initiatives to establish effective knowledge networks. In the Philippines, community-e-centres (CeCs) have established a network where stakeholders of CeCs can share experiences and best practices among network members. The National Computer Center (NCC) in the Philippines has organized three knowledge exchange conferences among CeCs over the past three years.

Similar knowledge networks exist in Latin America, Asia and Africa. In Bogota, a network of neighborhood information units have built a community oriented information network where members of the community establish contact with each other in the community and with the outside world. A ten telecentre network in the slum areas of São Paulo aims to broaden the rights of citizens thus helping them to fight social exclusion (Digital Dividend 2005). A similar

network of telecentres has been established by the Jhai community in Lao People's Democratic Republic to maintain the traditional culture among the Laotians. Citizens Information services in Mongolia, Digital Villages in South Africa and Information Centers in Cambodia are some other successful initiatives of knowledge networks.

In the Uva province of Sri Lanka, a 60 telecentre network was under threat due to poor communication. Establishing a strong communication network within the telecentre network was one of the key intervention strategies which improved communications. Subsequently, introduction of a local language e-learning platform enabled effective communication and knowledge sharing among the telecentre network.

Establishment of a Learning Network – An Australian experience

Western Australia, the largest state in Australia proposed a telecentre network to provide access and support to those wishing to pursue post-compulsory studies in remote and rural areas. The network was established in the form of a "learning network" through a series of telecentres. The broader consensus was that the learning network of telecentres should not only focus on education but also on government and community services. Thus transforming the telecentres into knowledge hubs. This was followed by a series of changes to the institutional and financial support structures which resulted in the growth of telecentres. Simultaneously the telecentre network provided a comprehensive range of services including the Internet related services, computer based services, resource centre services, social activities, government services, labour market programmes, community programmes and the likes. The network was expected to provide tele-health and tele-law in the future.

Some of the key factors for success of the Western Australia telecentre network were assured funding from the state government and a dedicated reformed institutional structure (Short 2002).

J. Challenges to establishing telecentre networks

As mentioned earlier telecentres are faced with many challenges. One way of circumventing some of these challenges is to form a 'network' of telecentres. However, institutionalizing telecentre networks is not without challenges. Critically, there are five types of challenges identified by telecentre practitioners:

- Start up phase – Understanding the socio-economic and cultural context. Identifying the right mix of services and products. Choice of technology and source financial resources. Selection of the right model, ensuring financial and social sustainability;
- Content, products and services – Getting the right information, local relevance, customization and sharing with other communities;

- Telecentre operations – Identifying the right target groups, problems of community mobilization for a common purpose. Challenge in accessing a common platform for knowledge sharing with other telecentre operators;
- Innovations – Identifying innovative cost sharing models, enhancing income opportunities and improving outreach to the community;
- Evaluation – Maintaining a system of continuous monitoring and evaluation to improve the scope of telecentres.

1. Towards forming networks

Identifying common platforms – this can be in the form of international meetings/conferences or regional/ national meetings/ conferences followed by movement/network level brainstorming meetings. Experience from successful networks suggests that series of meetings for advocacy and brainstorming is prerequisite for formation of networks.

Vision and mission – are the two pillars of success for networks. Countries like India and Bangladesh had a clear vision and a mission to achieve large networks.

Driver/motivators – not essential but can be very useful to motivate and guide towards achieving the mission. Establishment of the Bangladesh telecentre network was greatly motivated by the ‘Mission 2007’ of India which set the target of making every village a knowledge centre by the 60th independence anniversary in 2007.

Objectives – A clear set of objectives will focus the efforts on the right track. Objectives can vary depending on the final goal. Objectives can be:

- Identifying the right model of telecentres;
- Advocacy and awareness for practitioners;
- Coordination among telecentres;
- Identifying the right content and services and localization;
- Identification and promotion of innovative solutions/interventions;
- Identifying training and guidelines for telecentre network operators and coordinators;
- Identifying potential donors and sponsors.

Action Plans – There are many different types of activities which need to be performed in establishing telecentres and networks. With an action plan one could measure the progress of work and identify pitfalls and gaps. Action plans may include activities which will lead to specific outputs towards achieving the final goal. Typical activities of a telecentre network can be:

- Identifying organizations to partner the telecentre network;
- Organizing motivational workshops/seminars;

- Identifying champions or promoters;
- Organizing national/regional meetings;
- Organizing periodic network meetings;

Task Force – These are external committees of resources persons who perform a support function for establishing telecentres and networks. Specifically they will be entrusted with:

- Building awareness among stakeholders including the government on the importance of telecentre and knowledge networks;
- Supporting and facilitating telecentre networks through services and offer advice and guidance to ensure sustainability of networks.

Typically, a telecentre network task force will facilitate policy formulation for telecentre networks or strengthen/amend existing policies to facilitate smooth functioning of telecentre networks. The taskforce can assist and support in capacity development for telecentre operators/managers and coordinators. Further, it will Offer technical support and help in identifying right contents for various target groups. Offer support in operation and management and resource mobilization to foster telecentre networks.

Secretariat – The role of a secretariat with adequate staff will be essential to coordinate activities of all stakeholders including the task forces.

K. Impact of telecentres as a knowledge network

Impacts of pilot interventions are difficult to assess. Especially, when there is lack of information or periodic assessments. However, there are anecdotal evidences to indicate impacts of telecentres at least in the short term.

Some of the notable impacts of telecentres can be summarized as below:

- Empowerment of people especially women in remote rural areas;
- Enabling large number of people to share access to ICT tools which otherwise would not have been possible individually;
- Opening the world knowledge economy to poor and disadvantage people;
- Provision of social engineering. Some telecentres have been able to map available water resources for rural farming practices and identify Aurvedic plants as a business opportunity. Some have even identified medically risky groups for medical attention. Although many telecentres many not have achieved its intended objectives, they have opened many ICT options for people enabling them to be familiar with computers, Internet and other electronic devises. One of the greatest impacts of the telecentre network has been the opportunity given to poor people to improve their knowledge on computer education. In many telecentres , computer literacy is one of the most popular activities;

- Promotion of ICT for development. It is increasingly recognized that mere access to ICT alone is not adequate for development. Thus, establishing value added knowledge hubs could be the way forward in development. Access to business opportunities (e-commerce), access to agriculture markets and inputs supply, access to weather predictions and e-government services have given people the opportunity to plan their livelihoods better.

L. Telecentre services and users

In South Africa many telecentre users demand for phone calls, fax, photocopying, printing and typing as their preferred service options (Oestmann and Dymond 2001). On the other hand in many developing countries the greatest demand is for computer literacy which could lead to increase in employment opportunities. However, standardization of computer training is an unresolved issue (ICTA 2008).

Telecentres have been effective in providing information to empower rural communities by providing access to information on agriculture, education, business development, e-commerce and participation in e-governance etc. Strengths and weakness of each of these services depend on resources, institutional arrangements, policies and legislations. Political commitment too plays an important role in the success of telecentres. The Philippines telecentre network is particularly strong in e-governance due its political commitment and supportive policies at the local level. The community-e-centres have been acting as the conduit for e-governance and move towards universal access to ICT in the Philippines. In the Philippines national development strategy recognizes the role of community-e-centres and it is in line with the medium term development plan for 2004-2010 (Alampay and Umali 2007).

The e-Choupal initiative in India has improved farmer income through provision of market prices directly to farmers. Quick access to information has resulted in farmers being able to take an informed decision on sales of their produce.

In Kerala, India, telecentre networks were used as decentralized delivery points for government services on a public-private partnership model. The Akshaya, telecentre network project in Kerala, continued to provide, health, education, agriculture and legal services besides e-governance. These services empowered rural communities and enabled them to be active partners in the e-governance process. The telecentre networks have the ability to disseminate information to a large number of people, thus allowing public officials more committed towards community services. Further telecentre networks have contributed to reducing the space for corruption in the government sector due to the ICT based application process.

These examples indicate how telecentre networks have been effective in community development. However to sustain effective e-governance, two conditions are of paramount importance, i.e., related government sector reforms to support ICT based e-governance and change in attitudes of the government officials. Without these enabling conditions, rural communities will continue to have little or no contact with public officials.

1. Empowerment of women

Telecentre networks have taken the social responsibility of empowering rural women. In an inclusive Indian society, women are suppressed in the public domain. Role of the telecentre network and the involvement of the government have created a space for women to be active partners in the new information society. In Kerala, participation of women in the e-literacy programme has increased due to the confidence built by the state and the telecentre network. Besides, the role of the government as the facilitator has helped the telecentre operators to interact and transact better with the government and private sector organizations. Presence of the government has also induced a sense of social responsibility among the telecentre operators.

In Pondicherry, under the M.S. Swaminathan Foundation, women self help groups (SHG) were able to enter the public space through the interaction with telecentre networks. They were able to obtain small loans to purchase cattle for household income generation. The process of loan application and subsequent interaction with the banks has allowed them to be accepted by the credit institutions as credit worthy. This has set a precedence in the public domain where other women were encouraged to access bank loans for small scale income generation activities. This has resulted in three changes in the village community: a) with increasing household income, women were able to restructure domestic relations to the extent that their respective husbands were more willing to allow them to participate in public activities including telecentre network activities; b) banks and local authorities cooperated with the women groups and began interacting with the telecentre network on a regular basis; c) public attributed these changes to the telecentre network and its operators. They perceived the telecentres beyond just 'computer centres' and recognized them as 'vital source of information generation hubs'. The role of the telecentre network in revitalizing the community through the women self help groups have raised the confidence of telecentre workers. The village community believed that the telecentre workers have the ability to obtain relevant information for the community and village development.

2. Role of knowledge networks in development

Although telecentre networks were established to bridge the digital divide, it has diversified into many other facets of development. Besides its mandated function to initiate and sustain e-governance and e-commerce, telecentres networks have been actively promoting development at local level. A successful telecentre network operated by the M.S. Swaminathan Foundation in India, provides weather related and wave height information to the fishing communities.

The Foundation also collects market prices of grains, fruits and vegetables from farmers and farmer organizations. This information is conveyed to 'village knowledge centres', where volunteers post the information for wider dissemination among farmers and other users. Information regarding fertilizer and pesticides in government stocks is also provided to farmers in the same way.

The village knowledge centres access educational information from universities and institutions to be used by prospective students in the community.

Village knowledge centres provide health care facilities including maintaining a list of doctors, contact numbers and clinics. These centres have been instrumental in organizing health camps and training volunteers on various aspects of health care.

Telecentres play a critical role in disaster mitigation. In 2004, Indian Ocean tsunami, fisherman from South Indian sea coast had alerted the nearest village knowledge centre on the impending disaster. The timely action taken by the village knowledge centre had led to reduced loss of life and property. Given the increasing number of coastal hazards there is an urgent need for quick and responsive sea based information dissemination. Telecentres are ideally suited for this task. (Sundararajan 2008)

The most significant contribution to 'development' from telecentre networks emerge from computer based training. Supporting school curricula with appropriate ICT applications, computers for children, graphic design, hardware, web design and Internet are some of the more popular programmes offered by telecentres. However, lack of standardization of computer based training has been an impediment to e-literacy programmes.

Besides many benefits acquired from telecentre networks, maintenance of telecentres has remained as one of the key challenges to uninterrupted services to telecentre networks.

Especially, among developing nations, with very low revenue collections from telecentre services, the lack of regular maintenance can cause significant problems for continuous services. Few case studies mention collaboration with other technical institutions, like universities for regular updates and maintenance. However, these cases have not been very successful. In Nepal, Panauti telecentre had an agreement for technical support with the IT club of the Kathmandu University. But during the past two years there had been no maintenance of equipment or technical support. This is attributed to breakdown in communication between the telecentre and the university. Many students who were interested in the telecentre networks had left the university and the new students were not particularly interested. (Amatya 2007)

Evidence from Latin America suggests that although Internet and access to computers are powerful tools for development, it has not been the remedy for all development problems. The initial emphasis on technology has now shifted to more important and meaningful issues of social appropriation. While telecentres have increased access to improved education and economic opportunity, experience suggest that far more effort is required to make full use of the new technology than simply setting up computers and connecting to Internet (Gómez and Ospina 2001). Further, a survey conducted in South Africa suggests that personal computers and Internet was severely underutilized (Khumalo 1998). Causes for this was attributed to poor computer illiteracy, language problems, lack of computer culture, high cost of Internet and poor telecom connectivity. These findings indicated that mere provision of technology, infrastructure and Internet, were not sufficient to make telecentres networks work for the poor, enhance development and bridge the digital divide.

M. Role of the state, private sector and NGOs in promoting knowledge networks

Substantive discussion of this paper focuses on how to sustain the telecentre networks in a community environment, provide government services and how to be sustainable. The evidences suggest that there is no one single solution to all these issues. There are number of telecentre models suitable for different situations. However, irrespective of the model adopted, the institutional arrangement and the role of the key actors are important in sustaining knowledge networks.

Among the key stakeholders, the government plays a major role. The private sector is often called to play a supportive role by providing equipment or capacity building. Hence, the role of the government is a crucial determinant for success of telecentres. Participation and interest of the local end user communities are vital for the telecentre projects. Following are some of the key issues identified for the governments in development and sustenance of telecentres.

- Government is responsible for providing an enabling environment. This includes policies, legislations and regulations to support and develop telecentres as knowledge networks;
- Government is responsible for providing suitable tax incentives and duty wavers to the private sector to ensure smooth development and establishment of telecentres;
- Provision of required software, particularly for e-payments, e-governance, e-literacy, etc;
- Coordination and building partnerships between government agencies, the private sector, NGOs and the community;
- Provision of support and enhancement of confidence to build a critical mass of telecentres;
- Implementation of government sector reforms to encourage effectiveness of telecentres;
- Encouragement and stimulation of the private sector to be a proactive partner in development of telecentres.

The private sector on the other hand, needs to be proactive in taking the challenge to promote telecentres by providing necessary financial and logistical support. However, in this endeavor private sector is heavily dependant on the incentives of the government.

The NGO role is especially important for the actual operation and management of telecentres. They will be responsible for recruiting and organizing training for telecentre operators, planning activities and managing telecentres as a viable knowledge hub.

The communities are required to play a proactive role in all phases of establishment and operation of telecentres and knowledge hubs. It is important that they understand the strengths and weaknesses of telecentres and knowledge networks and attempt to rectify these challenges

in participation with other stakeholders. The community has a key role in sustainability of telecentres and knowledge networks.

N. National policies and political commitment

Many countries in Asia and the Pacific have their ICT policies and Acts in place. However, there are still number of challenges to overcome effective implementation of telecentres and/or knowledge networks. In India, the ICT policy is supportive of establishment of telecentres. It has taken the lead to design and implement the State Wide Area Network (SWAN) jointly with the government on a public-private –partnership mode. Anyone can establish a telecentre by obtaining a license from the Telecom Enforcement and Resources Management Unit.

However, in Latin America the need is to influence local, national and regional policies. The need for the government is to realize that communication and information are basic human rights and find ways to guarantee that public policies address not only the connectivity issues but more importantly community access to information and knowledge (Gómez and Ospina 2001).

Nepal is a developing nation which has taken ICT on board to improve good governance and narrow the digital divide. One of the goals of establishing telecentres in rural areas is to improve public access to employment information available on the Internet. In the ninth periodic plan (1997-2001), Nepal emphasized the development of the ICT sector. It has enforced policies related to ICT and had a vision to put Nepal in the global map of ICT within five years (Amatya 2007). Although Nepal has shown clear commitment to development of ICT, there appears to be gaps in implementation and enforcement of policies.

Although many countries have taken different initiative to formulate favorable policies, there are clear indications that a variety of social, economic and political factors influence policy processes and the potential of ICT as a successful tool for development (Colle 2009). While technological aspects of establishing telecentres are easy to handle, related social and political issues are more challenging. Some of the successful telecentres in India can be attributed to strong political commitment by bureaucrats who personally monitored the progress of telecentres.

Therefore, although national polices and political commitments are important factors, institutionalizing processes and structures are equally important for the future sustainability of telecentres.

O. Ownership

Although many different telecentre models exist, the same is not true for ownership models. In many developing nations, telecentre networks are mostly funded by donor agencies and managed by NGOs. These telecentres face many challenges to sustain. They perform a vital function by creating space for new services and applications. Therefore, these ‘donor funded-NGO managed’ models could continue to exist but they may not be the best option for large

scale replication for socio-economic development among developing nations. Only those models which can self-sustain financially are likely to be successful in large scale replications.

One of the drawbacks identified in the Indian telecentre networks is lack of a valid agreement between telecentre operators and the local government authorities. In the Nanasala project of Sri Lanka, telecentre operators and the government agency, Information Communication and Technology Agency (ICTA) entered into a partnership mode through an agreement. Accordingly, the ownership of the telecentre was to be transferred to the village community at the end of a four-year contractual obligation period. Although this appears to be a strong ownership model, current performance of telecentres do not reflect the success of this ownership model. Therefore, it's evident that many other factors contribute to be a successful model. Ownership is just one such factor. Some of the reasons identified for poor performance of telecentre business models are:

- Pricing – pricing do not reflect the cost of providing the service. This was evident in many telecentre computer training programmes. In Nepal, the Panauti telecentre charges Rs 1 (US\$ 0.0127) per day per student for computer training;
- No business plans and demand studies, lack of baseline information;
- Local competition – establishing telecentres among local telekiosks. Telecentres are not geared for this competition. Further, establishing Telecentres in an open market will distort the market for emerging local entrepreneurs;
- Many telecentres staff are under trained and under paid. Hence, they tend to leave for better job prospects. Telecentres also depend heavily on volunteers.

Thus, due to its ownership and operational model many telecentres are often seen as supply driven rather than demand driven. As in many other development initiatives, what is sustainable for the future are demand driven models with financial sustainability.

P. Sustainability of telecentres

To ensure the desired impact of knowledge networks on the target community, sustainability is indispensable. This constitutes the capacity to maintain desired level of satisfaction over an extended period of time by the target community beyond the period of outside interventions (e.g., beyond the project period). This should ideally include resilience to any technological changes that may take place during the period of intervention and beyond.

In order to attain the above, few key fundamentals need to be understood in sustaining the telecentre networks. They are as follows:

- Type of knowledge networks (KN) – there are different types of knowledge networks which are loosely described in literature. There is a need for clarity in definitions of knowledge networks. The commonly used term 'telecentre' is widely used for community knowledge centres which are non-profit and service oriented while 'kiosk', telekiosk' 'cybercafé' are community access centres which are profit oriented and more likely to be located in urban areas where the clientele is more affluent. Although

the above two types are community access points in general, they follow two different operational models. Hence, the sustainability too depends on the operational model.

- Operational models – usually telecentres are operated on service oriented ‘community’ or ‘development’ models. The private sector operated telecentres may take a more business oriented model. Some try to define a hybrid of the two models, which is called the ‘social enterprise model’. All these models need rigorous testing before any recommendation could be made. Success or failure of these models depends on the target group, location and structures and processes put in place by the recipient local governments and communities.
- Role of the government – experience suggest that governments have to restructure some of their existing administrative procedures for ICT applications to be effective. Besides, governments also have the responsibility for implementing favourable ICT policies and legislations and introduce tax incentives to encourage the private sector to be more proactive in promoting the information society.
- Infrastructure and connectivity – future sustainability of telecentre networks will depend largely on how governments react to the provision of essential infrastructure and the Internet connectivity including broadband. With the growing competition from the mobile industry, telecentres will need to have all the necessary facilities to offer quick and an efficient service to people.
- Partnerships – a synergy needs to be created between telecentres networks and other existing knowledge networks. Multi-stakeholder partnerships have proven very effective in mitigating risks and enhancing the demand for knowledge in ICT access points. Partnerships between knowledge networks and various local/national/regional/global networks can strengthen sustainability.
- Business plans – financial sustainability of knowledge hubs or telecentres will depend on effective business plans as much as on governance and partnerships. The business plan should clearly identify the cost sharing model, which indicates the balance between the cost and fees. The composition of cost and fees should provide sustainability to knowledge hubs or/and telecentres beyond the project period.
- Creating a critical mass – evidently, there is a mismatch between demand (usage) and supply (content) of what telecentres offer users. These two components are functioning sub-optimally. Hence the government has to intervene to create critical masses for markets to function in the long term. It would be the government’s responsibility to create a critical mass of telecentre networks, critical number of users and a critical mass of locally relevant contents for sustainability of telecentre networks.

Sustainability of knowledge networks essentially depends on sustainability of telecentres. Over the past two decades telecentre projects have identified the following key issues which threaten the sustainability of telecentres.

- High dependency on subsidies
- Poor involvement of governments and communities
- Limited creativity and innovative thinking

- Poor business models
- Lack of entrepreneurial skills
- Poor connectivity
- Lack of appropriate content
- Lack of human capital and low earning capacity

With efficient and effective management some of these issues can be rectified. However, commitment of the government, implementing organizations and participation of user community will be essential.

Q. Role of ESCAP

ESCAP maintains the support it rendered to the telecentre movement with the intention of bridging the digital divide and combating poverty. Although there are large number of functioning telecentres in the world and expected to grow further, there are very few comprehensive empirical research on growth and development of telecentres.

In the light of the above, the following are suggested as possible interventions by ESCAP towards facilitating a vibrant knowledge network in future:

- Create awareness among policy makers and involve them in the telecentre transformation process;
- Synthesis and documentation of best practices of telecentre networks to sensitize policy makers;
- Facilitate national level in-depth empirical research on telecentre networks;
- Encourage/promote administrative reforms in the government sector to facilitate e-governance processes;
- Initiate policy discussions on the role of telecentre networks in disaster management, and poverty alleviation;
- Encourage and recognize the Asia-Pacific Telecentre Network (APTN) as a coordinator and a facilitator to liaise between regional and national networks.

R. Conclusions

Telecentres are in the process of transformation. It had an initial development phase during middle to late 1990s and a progressive phase during the early 2000 and currently is in a transformation phase to create knowledge networks. Telecentres are moving away from the conventional mode of providing only ICT facilities. Many telecentres provide access to information and knowledge for education, employment, medication and health and government services to the user community. This transformation has increased the capacity of telecentres and strengthened sustainability. Community participation in the transformation process has been

encouraging. As a result, communities are willing to share the cost of information. However, financial sustainability of knowledge hubs and cost sharing for information are issues to poorer communities in many developing countries. Transformation of telecentres to knowledge networks has opened many opportunities for the poor including farmers and fishermen. In some cases they have been able to earn more income due to timely availability of information. Access to government services and medical care has become convenient and use of Internet for livelihood support is becoming popular. Although the establishment of knowledge hubs has made life easier for users, sustainability of services beyond the project period is a serious concern. While having a good business plan is an assurance, many other factors like, partnerships and governance are equally important in making knowledge hubs sustainable. The next step in the transformation process would be to align with existing knowledge networks. While some knowledge hubs have already established contacts with agriculture marketing and medical knowledge networks, a systematic approach could improve access to appropriate information and ensure sustainability.

ESCAP as the lead organization in the Asia Pacific region could facilitate the next steps in the transformation process and also strengthen some of the existing institutions. While establishing knowledge networks is the logical next step, strengthening telecentres as the fundamental node in the transformation process will be of paramount importance.

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