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FROM ACTION TO STRATEGIES

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Prospects for rural telecommunications development

Most of the populations of developing countries live in rural and often isolated areas. Access to information and telecommunications is essential for development of such areas but is still inadequate or non-existing in many developing countries.

Two major reasons for this are the perceived lack of profitability of rural telecommunications and the lack of appropriate policies and strategies to provide Universal Access.

People in rural areas are generally poor and few people can afford telecommunication services. This is a vicious circle - few potential customers means high price (if cost based), which further reduces the number of potential customers, and so on. New wireless technologies offer more cost-effective solutions. However, often, the incumbent telecom operator hardly has the capital required for investment in infrastructure to meet needs in more profitable urban areas and there are policy and regulatory barriers for new entrants, who might be willing to invest in rural telecommunications.

Many developing countries are now in the process of developing policies to improve telecom penetration in rural areas. Such policies include license obligations to serve rural communities (e.g. Mexico, the Philippines), subsidies by means of rural telecom development funds (e.g. Peru and Chile), variations of Build Operate and Transfer arrangements (e.g. Thailand), low interest loans, etc.

The often cited history of the development of rural telecommunications in the USA provides an interesting example. In this case relatively high penetration was achieved by independent local telecom companies (cooperatives) thanks to a combination of subsidized loans, provided under Rural Electrification Program and fair revenue sharing agreements.

Another promising sign is the recent experience in Chile, where the regulator invited bids for rural telecom licenses and offered to provide subsidies from the rural telecom development fund. Bidders who best met the requirements and asked for the least amount of subsidies were to be selected. Surprisingly, many bidders offered to implement the services *without* taking advantage of the subsidies offered.

¹ The views expressed in this paper are those of the author only and do not necessarily reflect the official position of the International Telecommunication Union (ITU).

However, still in many countries, one or several essential elements of such policies are missing, in particular fair revenue settlement agreements, which recognize that the calls originated *outside* the rural area contribute significantly to the operators' revenues as well as to development of business etc. also in urban areas [1, 3].

The minimum annual revenue/line required by the operator to be profitably is US\$ 330-400, assuming that the capital cost of US\$ 1'000 per line [1]. This is more than the average annual GDP/capita in many low income countries! Moreover, in most developing countries the capital cost per line is significantly higher and the average annual income of people in rural areas is even less than the national average. Therefore, in the absence of strongly supporting policies, like those indicated above, to increase penetration in rural areas remains difficult. This is true even in most of the Central and Eastern European (CEE) countries, where the GDP/capita is much higher than in most developing countries.

Consequently, in low income countries, the goal of *universal service* i.e., a telephone line to each household, appears to be unrealistic in the foreseeable future.

However, the cost of rural telecommunication technology continue to decrease. This fact, and the advent of the new Mobile Personal Communication Systems by Satellite (GMPCS), like Iridium, Globalstar and Teledesic, as well as the emergence of the International Mobile Telecommunications (IMT-2000), which aims to provide seamless operation of mobile terminals throughout the world, may radically change the conditions in the near future.

Some examples of new technologies as well as policy guidelines, based on lessons learned, will be provided in the forthcoming ITU Handbook: *New Technologies in Rural Telecommunications*. Many of the case studies mentioned below also includes policy guidelines. Two additional publications, which gives overviews of relevant current policies in a large number of countries and include many examples of different options and strategies to improve Universal Access are given in the list of references [21] and [22]. It should be noted that *Universal Access* is still generally defined as access to *basic telecommunications* only. However, the need for a redefinition of this concept is widely recognized and it is gradually changing to include also access to ICTs,:

In any case, *Universal Access*, i.e. community access to telecommunications at reasonable distance (depending on means of transport and how you value your time) is clearly at present a more realistic goal for rural areas in developing countries than Universal Service..

Universal Access through shared facilities

That there is a demand for telecom services, even among people with very low income, is evidenced by the phenomenal growth of small tele-shops, tele-kiosks or "telecentres", which are now mushrooming in many developing countries. However, the growth of such public call offices (PCOs), run by private entrepreneurs has usually not resulted from government policy and strategies to improve universal access. Rather, it has been driven by initiatives of shop keepers and local entrepreneurs who have "discovered" that there is a market for such services (and who sometimes started their operations illegally). Smart governments learn from action and develop policies and strategies which further promotes the development of these means of improving access.

Recent studies [2, 3, 8] indicate that such telecentres (PCOs) are commercially attractive both for the franchisee and the telecom operator and that they generate a considerable number of jobs (at least in densely populated areas). Some example are given below.

Senegal

In Senegal there is now more than 6'000 small "telecentres", operated by private franchisees, who offer phone and fax services and increasingly also access to email and the Internet. Such "telecentres" created more than 4000 jobs between 1992 and 1995. The average annual revenue per line was US\$ 5'544, of which the PTO collects US\$ 3'960 and the franchisee keeps the rest (40%). Their contribution to the GDP in 1995 was 0.37% - up from 0.24% in 1994 [2].

India

In the Indian state of Punjab there were 10'200 franchised "Teleports" (essentially a phone shops, sometimes offering also fax service) in 1996, thus generating more than 10'000 jobs. Interestingly, 25% of the franchisees were women. The average total annual revenue per "Teleport" was US\$ 9'267 and the average income per franchisee was US\$ 2'820 (30% of the total revenue) [3].

Thailand

Thailand has an ambitious program for rural telecommunications, with policies that favors competition [8]. In 1996 the telephone density in rural areas was only 2.9 lines per 100 inhabitants but the Second Rural Long Distance Public Telephone Project aims at providing complete coverage in terms of access at sub-district (Tambon) level. Under this program, at least 46'000 new lines will be added to the 7'712 lines installed by earlier projects. The strategy includes installing at least one PCO and a couple of payphones in each village and the target of the Eight Plan is to provide service to a total of some 64'000 villages by year 2001.

In 1996 the average annual revenue per PCO was US\$ 2'352. The financial internal rate of return on investment (IRR) was then estimated to at least 11% (using a more conservative estimated annual revenue per line of US\$ 1'411). However, the *economic* IRR (including savings in transport, but excluding many other benefits) was estimated to about 44% [8].

Bangladesh

Another example is the Grameen Telecom's initiative to lend money to women in Bangladesh to buy a cellular phone and offer telephone service (the Village Phone). This initiative was started in 1997 and the loan provided was about US\$ 350 [4] for the phone, training and hookup costs (the cost of the phone and accessories is estimated to US\$ 420 according to [5]). In just a few months the number of lending women increased from initially 28 to 60 [4] (73, according to [5]), presently in villages around Dhaka city. The average income per village phone operator was more than US\$ 700 per year, in spite of unfavorable interconnection agreement with the monopoly Public Telecom Operator (PTO). [4. 5]

These levels of revenue for the PTO is considerably higher than the average revenue per line (US\$ 332 in India 1995, for example) and the level of income for the franchisees is quite attractive in countries where the annual GDP per capita is of the order of US\$ 200 - US\$ 350.

Also Cyber Cafés are beginning to appear in many capital cities and seem to be thriving. Consequently, the Grameen Communications and Grameen Foundation in USA will implement a Village Internet Pilot Program, providing loans for Cyber Cafés on the same bases as the Village Phone described above [4].

Impact

As indicated above, one positive impact of the establishment of PCOs is that they generate a relatively large number of jobs (PCO operators). Some studies have also gathered information about the clients (numbers, age, gender, occupation, income levels, etc.), and about where they call and for what purpose. Attempts have also been made in some studies to assess other social and economic benefits of rural telecommunications. So far, the information gathered in this respect seems to be rather anecdotal, as illustrated by the following quote from a recent ADB study [8].

“Market messages: Farmers in an onion and garlic producing village Srisaket, in northeastern Thailand, sold directly to merchant in Had Yai in the south, phoning when produce was ready for delivery.

Other farmers...sold to a merchant in the provincial capital who had provided his phone number to call when they had crops to sell. These farmers checked prices regularly by phone, a practice which had significantly boosted their profits. A second village in the same province had similar relationships with merchants in Bangkok. One village chief in Suphanburi reported that farmers income in his village where a telephone was installed some years ago had doubled...”

Nevertheless, this ADB study [8] calculated an economic evaluation factor (EVF), based on savings in communication (travel and transport) costs, to be 2.6 times the cost of the call and some earlier ITU studies indicate that the value of a telephone call perceived by the user could be as high as five times the price of the call.

Some authors argue that the most practical way to evaluate benefits of rural telecommunications is to monitor the revenues. These are easily measured and supposedly directly related to usage and benefits. However, to help policy makers to decide whether Universal Access should include also access to modern *information and communication technologies* (ICT), more information about the cost and impact on social and economic development of providing access to ICTs in rural areas is needed.

Multipurpose Community Telecentres (MCTs)

The overall objective of the BAAP Programme No. 9 (now VAP Programme No. 3) [6] is to develop best-practice, sustainable and replicable models of ways to provide access to modern telecommunication facilities and information services, particularly to people in *rural and remote areas*. To this end pilot projects are implemented in a number of countries in different regions, at different stages of development and with different geographical, social, economic and cultural conditions.

These projects have been proposed by national partners in response to a Call for Proposals for pilot projects issued by ITU in 1994. Generally, they are *not* proposed as part of a national *strategy* for improving access to ICT (because most of them had none until recently). However, one criterion for selecting them was the national partners' preparedness to *learn from action*, i. e. that they agreed to experiment with new technologies, new forms of partnerships, funding mechanisms, etc., and use the experience acquired in the pilots to develop appropriate strategies. Another selection criterion was the level of commitment and the breadth of national and local partners, who in most cases are contributing with 50% or more of the resources required to implement the projects.

One objective of this programme is to evaluate the social, economic and cultural impact of providing access to such facilities and services and, thereby, sensitize policy makers to the needs for, and cost-effectiveness of providing such tools for development.

It there a demand for ICT in rural and remote areas?

Another objective of the BAAP programme is to assess the needs and demand for ICT in rural and remote areas. This is an iterative process where the various user groups, as they learn how to use the tools and about existing relevant information and learning resources, gradually discover what they can do with these tools and how they can benefit. This process also comprise the creation “content” that meet the needs of the various user groups and the adaptation of relevant existing information and learning resources to the conditions of people in rural and remote areas.

Ways and means to reach and involve poorly educated, and often illiterate people, using, for example community radio and TV will be explored. Development of appropriate user interface (including human facilitators) and ICT based resources to support literacy programmes, such as educational computer games, present formidable challenges.

Needs versus demand

It is important to distinguish between *needs* and *demand*. Demand is closely related to affordability, which, in turn, is related to perceived benefits. Of course there is initially hardly any *demand* for ICT in poor rural villages. The vast majority of the people have little money and no idea about what benefits they could derive from access to ICT. However, arguably, there is a *need* for such tools in rural areas even more so than in urban centres, considering people’s isolation and the lack of public services. It should also be recognized that the potential clients of MCTs *are not just the people in the community*. The needs of national governments and development agencies, including NGOs, to communicate with extension workers and to deliver information and other public services to the population in rural and remote areas, as well as their need to collect information from these areas, should also be considered in this context

Needs surveys, carried out before a project is implemented, is one way of involving the community and sensitizing the people to the potential of ICT. They should map existing information and learning processes, with a view to identify how these could be improved by provision of access to ICT. However, such pre-project surveys in communities, where most people are poorly educated (if at all) and haven’t even seen a telephone, let alone computers, are unlikely to identify needs other than those already imagined by the survey designers. Most people are unable to imagine the potential of ICT until they *see*, and actually *try out* the tools [20]. Only then can they express their needs as they see them.

For the same reasons, pre-project surveys will not provide much information about the actual *demand* for ICT in rural and remote areas. Considerable efforts of marketing, including free or nearly free use of the facilities, as well as of user training will be required to stimulate the demand. This cannot be effectively done before there is at least one demonstration facility and some relevant “content”, which people value more than the cost of accessing the ICT tools, has developed by the pilot project. Also governments and community authorities need to see the benefits (impact on development) clearly demonstrated before they will be prepared to pay for ICT services offered.

Provision of telecommunications and IT facilities is not a goal in itself. To have a real impact on *development in rural and remote areas*, the introduction of such facilities and services must be

done as an integral part of a cross-sectoral, multi-disciplinary effort of community development [7].

Thus, many specialized UN agencies and NGOs have an important role in capacity building for the development and adaptation to the local context of applications and "content" relevant to their field of activity. The Multipurpose Community Telecentre (MCT), introduced in the pilot projects, will provide facilities and support for a wide range of services and applications responding the needs of the community. By sharing the cost of the telecom infrastructure, IT facilities and support, the MCTs are expected to provide both public and private ICT-based services at more affordable cost and still become commercially viable in a longer perspective.

What makes MCTs different from “tele-kiosks” and PCOs?

One significant difference between an MCT and the above described variations of PCOs, tele-kiosks and small “telecentres” is that the “Multipurpose” aspect. MCTs, by definition, offer more than just basic communication services and, in particular, *public* services, e.g. tele-education, tele-healthcare and “government/community-on line”. MCTs could also provide postal and banking services and function as an outlet for other communal services such as water and electricity. A maximum offer of “private” information and communication services, such as tele-trading, rental of virtual offices, vocational training courses and support to SMEs, email and Internet access, will improve the sustainability and increase the impact of the MCT [9].

Provision of the all important *user support and training* is another feature that distinguish MCTs from PCOs and the typical tele-kiosk. Last, but not least, MCTs aim at developing rural people’s capacity, and provide the means for them to participate in democratic processes and to *produce* information and knowledge, which is relevant to their needs.

Of course, the MCTs do not exclude provision of access to individual subscribers or PCOs. On the contrary, adding as many subscribers as possible makes the investment in telecom infrastructure more commercially attractive. The MCTs will most likely play a role in marketing such services to individuals or enterprises who can afford their own facilities and could handle billing and repair services for the operator (which tends to be costly in remote areas).

MCTs, once replicated in many communities at the national level, also provide a support structure for implementation of other national and international programmes aiming at providing access for specific applications, e.g. tele-education, tele-health and tele-trading in schools, hospitals and trade centres. For example, programmes aiming at provision of computers to schools in rural areas would need support for capacity development of teachers and for repair and maintenance of equipment and SW which inevitably will go wrong from time to time. The same MCT which provide this support for schools could also provide similar support for a programme aiming at providing facilities for tele-health in the local hospital or for a local “trade-point”.

The question is not MCTs *or* PCOs (tele-kiosks, etc.). They are complementary and one could very well imagine a PCO being upgraded to an MCT. It makes sense to build upon the already proven business model of PCOs because voice telephony is likely to provide the major revenue stream also in MCTs.

However, this assumes that there is a telecom infrastructure, which is capable of supporting the applications indicated above is there (which is usually not the case in rural and remote areas) and that the PCOs or Telekiosks manager has the capabilities required to extend his business to provide ICT access, training and user support.

MCT - a business case?

Commercial viability (at least after some years of operation) is obviously a condition for the MCT model to survive and become replicated at a large scale.

As indicated above, PCOs seem to be a thriving business for the franchisees, even in rural areas (at least when densely populated) and, consequently, this model is replicated spontaneously without any need for support from government or the international community. But how about MCTs which require significantly higher investment and are more costly to operate?

MCTs are established in many *developed* countries (in rural and remote areas in Europe, North America and Australia) since the first MCT was inaugurated in Sweden in 1985 [23]. Surveys made of these Telecentres indicate that many of them closed when government support was withdrawn, generally after 2-3 years of operation [23]. In Finland, for example, reportedly now (1998) most of the telecentres established with government support are out of business (more than 70 were built and there were 49 of them operational in 1995 [23]).

This does not necessarily mean that the government funding was wasted, as the telecentres contributed to develop the market for information and communication services and the capacity of people in remote areas to participate in, and benefit from the Information Society. The result of the question about financial viability in a recent survey of telecentres in Ireland and UK, where there are now an estimated 200 “Telecottages”, many of which are in rural areas, [15] is shown in the graph below.

What was the financial situation of the centre in the last financial year?



Source [15]

This doesn't look very promising. However, there are some very significant differences between developed and developing countries. Thus, in high income countries, people, even in remote areas, generally have their own telephone line and can afford to buy a computer and a modem once they discovered the potential benefits of such tools (marketed through the MCTs). Their level of education and exposure to modern technology is much higher than among people in developing countries and they have better access to training, both in computer literacy and other vocational training courses. Moreover, while people in developed countries have much more money to spend on ICT, the cost of the staff operating the MCTs is also very much higher than in developing countries.

Furthermore, *Governments'* needs are different. In high income countries, also rural areas enjoy reasonable (though declining) public service, which in many low income countries is virtually non-existent in rural areas. In such areas, access to information and knowledge through ICT may go a long way to compensate for the lack of adequately trained teachers, health workers and extension workers. For all these reasons, the experience made in developed countries is not necessarily applicable to low income countries.

Alternative business models

Preliminary studies of the financial viability of MCTs in rural areas in low income countries (Uganda, India and Suriname) indicate that they could be attractive business cases, at least for local entrepreneurs, but this remains to be proven [9, 17, 24]. These studies have been made for "stand alone" business (Uganda) as well as for a business comprising 12 MCTs (India). The importance of *community ownership* (meaning that the MCT is run by a cooperative or entrepreneur from the community) has been stressed. Experience indicate that people who live in the community and on the MCT as a business have more incentive to provide good service and to respond to the needs of their community. Also if the MCT is perceived as owned by somebody in the community (or collectively by the community) it is less likely to be subject to vandalism and theft.

Economy of scale could be envisaged by creating a national cooperative or privately funded holding company, e.g. a Telecentre chain à la Macdonald, at national, or even international level, with franchised MCT operators. Through joint purchasing, such a holding company could get attractive prices. By providing centrally and/or regionally located hubs for support and training, it could also reduce the operational cost.

The MCTs could be of different sizes and provide different services, according to the size and density of the population and the needs in the community or region. There could also be a network of small "satellite telecentres", connected to the centrally located MCT. At the low end these could be inexpensive (~US\$ 500) hand-held PCs (PDA) connected to fixed or portable terminals for satellite or terrestrial networks offering email and low-speed datacommunication, for communal use in small villages. This assumes that the users have been trained in a local MCT, which is equipped with some training facilities. Fully fledged MCTs (which may require a capital investment of kUS\$ 50-100) would be established wherever economically feasible.

Where are the MCTs ?

In the absence of a universally accepted definition of an MCT, it is very difficult to tell how many MCTs there are in the developing world and where they are. An NGO, called Community TeleService Centres (CTSC) International, established in 1989, contributed, to build awareness of the MCT concept worldwide by organizing international seminars on this theme as well as study tours to MCTs in Scandinavia.

Thus, most of the early telecentres established in Australia, Canada and Europe, including the more recent ones in Estonia and Hungary were inspired by the Scandinavian experience. ITU/CTSC also catalyzed a major telecentre programme in Brazil, which started in the early '90s. Both CTSC and ITU, who through its "Integrated Rural Development" Programme, contributed to put MCTs on the agenda of most international development agencies, have attempted to keep track of the development. However, even national telecentre associations seem to have difficulties to tell exactly how many telecentres and where they are in their country so the information gathered by the CTSC and ITU is rather incomplete. Recently, the World Bank commissioned a study, aiming at making an inventory of telecentres worldwide and identifying "best practice" telecentres but the report is not yet available.

MCTs in high-income countries and countries in transition

As mentioned, many MCT (and MCT “look-alike”, such as distance learning centres, electronic libraries, etc.) are established in towns and rural areas in many *high-income countries* but the experience made in these countries is not necessarily always relevant to low-income countries.

MCTs have also been established recently in some of the Central and Eastern European (CEE) Countries in transition, e.g. Estonia 33 “Telecottages” by end 1997 [26] and now more than 50) and Hungary (23 “Telecottages” by end of 1997 [27] and now more than 50).

MCTs in developing countries

Within the ITU BAAP Programme 9, pilot projects are currently being negotiated and implemented in Benin, Bhutan, Honduras, India, Mali, Mozambique, Suriname, Tanzania, Uganda and Vietnam. Feasibility studies have also been made for pilot projects in Haiti, India, the Maldives, and Romania. The five pilot projects in Africa are implemented within the framework of the UN-System-wide Special Initiative for Africa. CIDA and ITU are currently considering to jointly support some additional MCT pilot projects under the CIDA-ITU MOU announced in WTDC-98; one or two in Asia-Pacific and one or two in the Americas region. Within the framework of this MOU, CIDA also envisages to join the ITU and its partners in the MCT pilot projects in Benin and Tanzania.

All these MCT pilot projects are implemented in partnership with concerned national organizations and institutions (in particularly the telecom operator is one essential national partner), and, in some cases, with the private sector. Major international partners, include the International Development Research Centre (IDRC, Canada) UNESCO, The Danish International Development Agency (Danida, Denmark), the Swedish International Development Agency (Sida, Sweden). The Canadian International Development Agency (CIDA, Canada), British Council and a number of other specialized UN agencies are now joining the programme. Also NGOs (e.g. Pact Institute, USA, the International Red Cross/Red Crescent and the Peace Corps) are participating, or have expressed their interest in partnership in some of the projects.

More information about the status of these projects is given in [10] (see also *Description of Pilot Projects established by ITU and its Partners* at <http://www.itu.int/ITU-D-UniversalAccess/pilots/pilot-index.htm>).

In addition to the pilot projects initiated by the ITU, several other development agencies, have started their own “telecentre programmes”. Thus, in 1997 six rural MCT pilot projects were started in South Africa by the Universal Service Agency [18]. There are already a number of other telecentres in urban or suburban areas in South Africa and there are plans to implement hundreds of them in an ambitious rural MCT pilot project programme, with support from international development agencies. UNDP contributes since this year (1998) with funding for implementation of some (city-based) MTC pilot projects in Egypt and a UNDP funded project involving MCTs is to be implemented shortly in Trinidad. USAID and other agencies support Telecentres in Ghana, some of which seems to be MCTs. In Mexico, 7 Telecentres were to be established in rural towns surrounding Mexico City in 1997 but only 3 were operating in June 1998. A plan to establish another 16 centres was adopted by the end of 1997, but only two of these were operating in June 1998. IDRC and CIDA are contributing to an MCT pilot project in the Philippines. This list is probably not exhaustive but gives an idea of how rapidly the concept has been adopted in many quarters.

The large number of pilot projects provides an extraordinary opportunity for research and will, hopefully, produce a range of models, adapted to different conditions. It also offers opportunities for synergies, e.g., sharing of information and knowledge resources developed by and for rural populations.

However, there may also be some unnecessary duplication and a risk that people get carried away and invest too much in MCTs before their sustainability has been proven.

Evaluation of MCT Pilot Projects

A common framework for evaluation of the MCT pilot projects, including research questions to be answered, indicators and tools, is now being collaboratively developed by the partners. This will provide a broader research base, enable cross-cultural comparisons and facilitate the identification of "best practice" and sustainable and replicable models among the increasing number of pilot projects implemented under various development programmes [10].

In accordance with the objectives of the MCT pilot project programme outlined above, the proposed evaluation framework will focus on the following broad research questions:

- Does access to ICTs in rural areas contribute to social, economic and cultural development and, if so, how and what are the benefits?
- Are there any adverse effects and, if so, which?
- Do MCTs provide a sustainable way of providing universal access to ICTs and what are the conditions which must be met to make them economically viable and replicable? If not will they ever be and under which conditions? Are there other better ways?
- What are the best practices for the set up, organization, management and operation of MCTs, including policies and regulations to promote the replication of such centres at the national scale based on private sector investment?

To answer these questions one needs to define and agree with stakeholders at all levels what is meant by "development" and identify *observable indicators* that will measure as many dimensions as possible of development. Two sets of measurable (qualitative and quantitative) indicators are needed:

- standard "core" indicators relevant to all pilot projects, to generate cross-project comparable data for the evaluation of project sustainability, effectiveness and impact, which will facilitate identification of best practice, replicable models; and
- project specific indicators defined by local stakeholders to assess the sustainability and impact of an MCT within the specific context of the community and to meet the national and local stakeholders specific needs for information about the project.

A large number of quantitative and qualitative indicators to measure impact at national, institutional and community levels have been proposed (see [10]). Some of this initial set of indicators will need to be specified further and that some of them will probably turn out to be impractical to measure and monitor.

The programme especially aims at enhancing participation of rural populations, particularly *women* and *youth* in democratic processes and to stimulate transfer of "indigenous knowledge" *from the*

local community to others, including exchange of knowledge and experience among rural MCTs, which may have similar needs.

Thus, indicators also need to be developed to measure:

- local capacity for informed decision-making to enhance personal, institutional and community development in the areas of health, education, economy and general development;
- the production of local information and knowledge to improve local knowledge structures and to what degree that knowledge is transferred and used outside the community.

The methodology calls for a combination of participatory case-studies, focus groups and data collection across projects, *before* (base-line study), *during* and *by the end* of the pilot projects. It will involve all stakeholders and will rely heavily on nationals in the participating countries for the continuous data, and information collection and monitoring of the projects. It therefore includes the development and implementation of a stakeholders' learning system, to enable them to fully participate in and contribute to the evaluation.

The base-line study aims to get an overall picture of the specific characteristics, needs, resources and limitations of the community and the potential users/user groups and to establish the value of selected indicators before the MCT is starts to operate. Thus, it will also provide inputs to formulate specific interventions to be designed around the MCT to stimulate learning for development, based on the identified needs for ICT and availability of transferable indigenous knowledge. I may be expected that the users themselves will later discover needs and applications that could not be imagined before the MCT becomes operational and strategies will then have to be adjusted accordingly.

This means that strategies will largely be developed as a result of a multitude of decisions taken at operational levels, during implementation. *Learning by doing - or - learning while doing!*

The evaluation involves also gathering information about other expected and unexpected (side-) effects, generated by the project. In particular, this involves keeping track of :

- community development activity, involving people at the community level, stimulated by the MCT;
- institutional development, which can be attributed to the MCT
- policy development at the national level;
- establishment of support structures at the national and community levels,
- private sector participation;
- effects of changes in tariff structures and pricing policies;
- synergy created by coordination with development agencies, NGOs and private sector funded projects or activities, thanks to the MCTs.

Comparative studies of similar communities which do not have MCTs would be desirable to facilitate the difficult task of isolating impact attributed to the MCTs from other factors contributing to change. Such comparisons are foreseen in the Acacia evaluation of the South African MCT pilot projects. Data collected in the South African evaluation exercise could possibly also be used in the evaluation of the ITU programme.

One aspect of the cost-benefit analysis, of particular interest to the ITU, is the costs of building and operating the MCT and the associated telecommunication network, in relation to the revenues

generated for the MCT operator and the Telecom operator (the business case). Questions related to affordability of services, tariff structures, price elasticity, interconnection agreement and revenue sharing agreements are also of interest to the ITU and the answers will be used to develop the relevant policy guidelines.

A third issue of great interest to the ITU is *sources of finance*, (including loans, equity participation, partnership arrangements, government subsidies, etc.).

Pilot projects are by definition of a ‘discovery’ nature. It is therefore understood that the proposed evaluation framework model will develop and evolve considerably during implementation.

As mentioned, there are by now quite a few case studies which attempt to evaluate profitability and social and economic impact of provision of *basic telecommunication* services to rural areas through PCOs and increased penetration [2,3,4,5, 8,11, 12,13]. Some studies have been done of MCTs in high income countries. However, very little is known about the cost, revenues and impact of provision of *advanced information and communication technologies (ICT) in developing countries*.

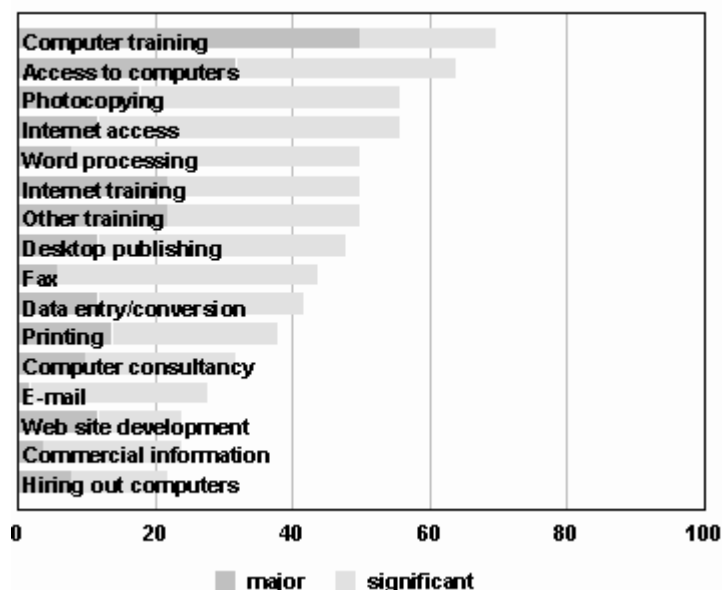
Studies of MCTs in High Income Countries

Studies of users, usage, perceptions, organizational set up, financial performance, funding mechanisms, etc. have been made of MCTs in the high income countries (see for example [14], [19] and [23]).

Ireland and UK

The number of “telecottages” in Ireland in 1998 is estimated to some 200. The analysis of services provided by some 50 of those (50% of which are situated in small rural towns or remote villages) who responded to the SWT & TCA survey in 1998 [14] is probably indicative for many of the MCTs in high income countries (see below)

Which activities/services are provided?



Source [14]

Additional service offerings mentioned by the respondents include language translation; bookkeeping; recruitment; abstracting; website maintenance; and commercial & tourist information service provision. Call Centre & message taking services [14].

USA

A recent survey of 44 Community- based Technology Centers (CTCs) in the USA provides some other insight in usage and impact. Some interesting conclusions of this survey are quoted below.

- *Out of 419 people who had a goal of finding a job 149 had used the Community Technology Centre. Of those 19% had reached the goal and 41% “had come a lot closer”*
- *The kinds of formal learning experiences offered by centers and the extent to which center visitors made use of them is indicated by the following survey findings:
63% (of 717 respondents) took computer classes for personal satisfaction.
65% (of 707 respondents) took computer classes to improve work skills.
41% (of 675 respondents) got homework help or tutoring at their center.
36% (of 628 respondents) took academic classes (GED/ABE, ESL, reading, etc.) at their center.*
- *Over half of the survey respondents said that socializing was an important aspect of their experience at their community technology center*

“Taken together, these findings suggest that community technology centers provide lifelong learning opportunities that appeal particularly to girls and women.”. “The people who are served by community technology centers are typically those who may be too fearful, too poor, too discouraged, or too disenfranchised to take more conventional paths to achieving this end”

These findings may not be relevant for rural areas in developing countries, where social, economic and cultural conditions are very different from those in the USA. Or are they? Perhaps the difference between marginalized people in the USA and the rural poor is not so big, after all? The only way to find out is of course to provide these people with access to ICT tools and see what happens.

Similar studies have also been made of two of the Brazilian “Telecentros” established in towns [14]. The study of impact of the (self-sustained) Red Científica Peruana (RSP) also provide some interesting information about *usage of internet* and perception of benefits and problems [16]. RSP is essentially a network of individual users and user institutions. However, the network also includes public “telecabinas”, which provides email accounts and Internet access, mostly in Lima and its suburbs.

These studies, too, mainly focus on *users* (age, gender, education, occupation, income level, etc.) and *usage* (what tools/services and for what purpose), rather than on indirect effects, such as job creation, productivity improvement, improved healthcare and education, etc., which requires longitudinal studies. A report on the “Telecentros”, established in Mexico in 1997, mainly focus on the reasons for failures to implement the plans (financial problems, lack of telecom infrastructure, possibly a too narrow scope. etc.) and make some proposals to remedy these problems.

MCTs in developing countries is a very recent phenomenon (with the exception of the Brazilian Telecentros, which are not really in rural areas). Only a handful of those planned in rural and remote areas have actually started to operate. Therefore it is too early to assess their impact in terms of social and economic development.

This year (1998) the first evaluations of MCTs in truly rural areas in developing countries have been carried out. One of these studies is the evaluation of the MCT pilot project in Suriname [17], implemented in 1996. This was a first field test of the above described preliminary evaluation framework. The other is a preliminary evaluation of six pilot telecentres in rural South Africa, set up in 1998 [18]. Some of the findings are summarized in “Lessons learned” below.

As indicated above, an increasing number of development agencies have now realized the potential of MCTs or Community Information Centres as tools for development and are now either joining the ITU programme of MCT pilot as partners or starting similar pilot projects themselves. Sharing of information and lessons learned among all these initiatives is envisaged within the framework of Partnership for ICT in Africa (PICTA) and the Global Knowledge Partnership (GKP). This will also contribute to the development of the evaluation framework and increase the research base.

To meet growing demand for more information about Multipurpose Community Telecentres and to stimulate sharing of experience and resources developed in the MCT pilot projects, ITU/BDT, in partnership with members of PICTA and GKP, will organize a series of five or six regional seminars/workshops on the subject in the coming year (1998-1999). Subject to availability of funds, these workshops are tentatively planned for Eastern Europe, Africa (South Africa, February, 1999), The Arab States (Tunis, March, 1999), Asia, Latin America and, possibly, the CIS countries.

The objectives of these seminars are to:

- ❑ raise awareness amongst decision and policy makers about the potential of MCTs to promote economic and social development in rural and remote areas and "best practice" policies for promotion and replication of the MCT models.
- ❑ disseminate results of preliminary evaluations of pilot projects and provide participants with the information they need to develop business plans and options for financial strategies;

- bring together nationals involved in MCT pilot projects partners to share information, experiences and best practices, with a view to stimulating the creation of network(s) for continuous sharing of resources, adapted the needs of rural people;

These seminars could be regarded as part of the preparatory activities for the GKII conference in Malaysia in the year 2000.

Lessons Learned

Cross-sectoral collaboration and partnership

Even though few MCTs are yet *operating* in rural areas in developing countries, a number of lessons have been learned from the process of establishing these. To be sustainable, MCTs require to offer services and “content” that meet the needs of the community. There is yet little relevant information and knowledge, available electronically in a language and format rural people in developing countries can understand and use. Relevant “content” needs to be developed and adapted to user-friendly interfaces. The need for cross-sectoral public/private partnership, involving also local actors has already been highlighted.

Not surprisingly, one of the major difficulties has been to create an environment where representatives from different occupational sectors, public and private accept to collaborate in a joint project. Public sectors, like transport, communication, education and health care, usually compete for public funds and traditionally work in splendid isolation from each other. This is reflected also at the level of international development agencies. Each specialized UN agency, for example, was expected to stick to its “mandate” and coordination between agencies was generally poor, in spite of the numerous mechanisms for inter-agency collaboration established by the UN system.

ICT, which increasingly is recognized as essential tools in most occupational sectors, has contributed significantly to improving collaboration between development agencies, in various ways. It has highlighted the need for collaboration in development of an infrastructure and for capacity building needed by all sectors. Thus, several fora for “donor” coordination, such as Partnership for ICT in Africa (PICTA) and Global Knowledge Partnership (GKP) have been created in the last two years. Moreover, the tools themselves have enabled individual staff members (“change agents”) in development agencies to work collaboratively in an informal way (e.g. through email), thus overcoming resistance to change and the obstacles to collaboration which are inherent in large bureaucratic organizations.

The MCT pilot projects, which have been developed collaboratively through such informal networks of staff members in different development agencies, are among the best concrete examples of the significant improvement of inter-agency collaboration that has taken place in the last few years. One lesson learned is that partnership are best established around *concrete* projects, where the partners get involved at the design stage. Other lessons learned in this process are that this is greatly facilitated if:

- the organizations allow for some flexibility in the allocation of funds for specific project and activities, which are not necessarily initiated by the organization itself, so that decisions can be made relatively quickly to jointly fund some activity which is not programmed way ahead;
- the individuals involved are authorized to make such decisions (or have enough clout in their organizations to ensure that decisions to allocate funds for joint activities are made timely);
- there is a high level of trust among the individuals involved. This requires that they are able to

meet physically from time to time to develop and maintain friendship and trust, that they are good team workers and that there is a degree of reciprocity in terms of sharing information and other resources.

Some development agencies have made considerable progress in this respect (spearheaded by the PICTA members, who are partners in the MCT pilot projects). The number of agencies collaborating in ICT development is steadily increasing. The private sector is also open to partnership and has sponsored a number of events, such as, for example, the Global Knowledge Conference, Toronto, 1997 and Global Connectivity for Africa Conference in Addis Ababa, 1998. Private sector partnership, too, requires concrete projects to materialize. Mechanisms for public-private sector partnership are still in their infancy stage and new approaches are being tried out in the MCT pilot projects.

Obviously, it is equally, or even more important to involve national and local partners in the design of any project. National and local ownership of the project is a conditions sine qua non for sustainability. However, effective cross-sectoral collaboration at the *national* level remains difficult to achieve in most countries.

Where it works, it is usually thanks to some national “champion” with sufficient political clout and access to decision makers in the various concerned occupational sectors. Also visits from staff or consultants from development agencies, who have access to such decision makers, preferably joint missions by staff members from several agencies, are required to catalyze this process.

Evaluation of the Suriname MCT pilot project

The recent evaluation of the Suriname MCT pilot project highlights some of the challenges facing projects, where the achievement of the objectives depend on the establishment of broad partnerships[17].

Background

Two basic telecentres, each comprising public phones, a fax and a computer were established in 1996 and 1997 respectively in the interior of Suriname where there were no communication facilities, nor any continuous electrical power supply before the establishment of the telecentres and the associated infrastructure. The telecom technology used is inexpensive a fixed cellular communication system, linked to the national network by a digital microwave link built by the project. The equipment is solar powered, with batteries and a generator, which works during evening hours or in case of cloudy weather.

The Brownsweg “MCT” is located in a rural community of scattered villages in the jungle in the Brokopondo district at a distance of some 160 Km. from the capital Paramaribo. The centre occupies some 20 m². of the ground floor in a small building shared with other local government offices, in particular a primary health centre on the first floor. The facilities were clean and the equipment in good working order at the time of the evaluation. On the front there is a sign saying “Telephone-Facsimile-Data Communications-Paging”, yet the latter two services are not effectively delivered on a regular basis at the time of the evaluation.

The Gujaba MCT is located in the heart of a Bushnegro community in the upper Suriname River, some 240 Km. from Paramaribo. Access to the village of Gujaba is by river, only by canoes or small motorboats), since there are no roads. The surface of Gujaba MCT is slightly bigger than the

Brownsveg MCT but it has only one telephone line to serve the facilities which is often out of order due to power problems (fuel for the diesel does not always come in time). Also some individual subscribers (village chiefs, etc.) in both regions have been provided with cell-phones using the same cellsites.

Preliminary findings and lessons learned

The pilot project was to include also the development and testing of a range of public and private information and communication services, relevant to the needs of the people in the interior. Therefore, at an early stage other potential partners and stakeholders were invited to participate in, and to contribute to the project. These included the Ministries of Education and Health; UNESCO, WHO/PAHO and a number of national and international NGOs, as well as the local authorities in the concerned villages. Most of these organizations and government agencies expressed their interest and intention to participate in the pilot project. Regrettably, this has not materialized yet.

It was initially planned to upgrade the two basic telecentres to fully-fledged MCTs with several multimedia stations for user training in computer and communication skills and to test applications such as tele-education, tele-health, videoconferencing, and also to provide facilities for community radio and video production. In subsequent phases of the project, a number of additional telecentres and network access points were to be implemented in other regions of the interior. Once fully accomplished, the plan claimed it would provide access to telecommunications for some 80% of the rural population in the interior.

However, funding for the subsequent phases could not be mobilized. Hence, at present, neither the infrastructure, nor the services originally envisaged are implemented. Naturally, this adversely affected the proposed outcomes; the telecentres at Brownsveg and Gujaba are presently limited to only public telephony, a little fax usage and some occasional work in the single PC units, still in place at each location.

Critical aspects, such as marketing, promotion, introduction and development of new services, partnership enlargement, customer training and service, etc. have been almost entirely disregarded. As a result of the lack of market research and follow-up information systems including customer surveys, little data is currently available to support planning and decisions influencing subsequent phases of the project.

Information was generally not available or hard to get by. For example, there are no official, desegregated data from the villages of Brownsveg and Gujaba available at the village level. It is estimated that there are roughly 3'000 inhabitants (600-800 households) in Brownsveg and neighboring villages and some 1000 inhabitants (300 households) in Gujaba. There are several small primary schools and health centres in both areas. Economic activities, besides subsistence farming, include forestry and gold mining. A number small NGOs are active in the areas.

A short-term target of 10% users among the population, based on experiences elsewhere, would yield 300 prospective customers for Brownsveg and 100 for Gujaba. However, in fact there are 3 to 5 times less customers at present. PCs usage is very scarce and there are no training or educational services. Nevertheless, a survey found that over 96% of the locals are willing to attend any kind of training courses on a 2 to 6 hours a week basis, if these are offered free of charge at the MCT locations. Subjects like "Food Preparation", "Fishing", "First-aid and other health care matters", and "Woodcarving and other works in soft wood" were among the courses demanded. Experiences from the "Cybercafé" inaugurated in 1998 in the capital, Paramaribo and currently run

by entrepreneurs also indicates that the demand and business opportunities *do exist*.

From a customer survey carried out at Gujaba, it appears that about 43% had an income of less than US\$33 per month. Only two respondents earned more than US\$ 222/month.

Preliminary findings indicate that the lower income group is prepared to spend more than 3% of their available income, as compared with a world average of about 1.5%, reflecting the lack of alternatives for communication and the high opportunity cost (long and cumbersome travel).

With this small customer base, limited service offerings and relatively high operational costs, the telecentres are currently not commercially viable and the project has not achieved the objectives.

Some of the reasons the failure (besides those indicated above) to achieve the project objectives are:

- lack of marketing, awareness building and user training
- raise of tariffs in 1998 (the tariffs more than doubled to rebalance reduction in international tariffs, forced by competition)
- competition from individual subscribers who resell communication services at lower price
- technical problems and limitations, e.g. the inexpensive fixed cellular technology used is not suitable for applications requiring higher bandwidth than 9.6 kbs, the solar panels did not generate enough power as cloudy periods were more than predicted, equipment out of order, due to maintenance problems and/or lack of power, etc.;
- short opening time (government office hours 7 a.m. to 4 p.m.);
- congestion at the Internet gateway in Paramaribo (adversely affecting access to emailing and Internet in the MCTs).
- lack of national and local “champions”

Most of the above causes for failure were predictable. The need to find local champions, who are motivated and able to drive the project, cannot be overstated. But this is easier said than done. There is perhaps no lack of bright young entrepreneurs even in rural and remote areas. However, to find somebody who also have some of the skills required and sufficient status to influence people in the community needs more than ordinary luck. Training in project, and business management as well as in ICT will in any case be needed, as confirmed also by the evaluation of the South African MCTs [18]. During a transition period, to involve NGO representatives, who are active in the community, has proven to be enhance significantly chances of success.

The good news are that the evaluation mission itself gave a new impetus to the project. An evaluation team, composed of members from various sectors was established to continuously monitor the progress of the project. A revised business plan and a proposals for remedial actions was prepared.

Form the evaluation of the six MCT projects in South Africa another lesson learned is that it is important to clarify the roles of all partners in the project and to make sure that all actors accept their responsibilities [18].

Again, most people with experience of management of projects and business, involving several partners, would be aware of this rather obvious fact but the confirmation of such “common sense” by learning from action may still be needed to shape appropriate strategies.

A web site for sharing information and resources about pilot projects has been set up. A significant amount of information related to Universal Access, telecentres and rural telecom development, as well as information pertaining to regional seminars, is now available. (See <http://www.itu.int/ITU-D-UniversalAccess/>)

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