

The contribution of user-based subsidies to the impact and sustainability of telecenters – the eCenter project in Kyrgyzstan¹

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Abstract—We examine the extent to which user-based subsidies can promote the sustainability and development impact of telecenters, where sustainability is defined in financial and social terms. We do this by looking at a coupon scheme used by the USAID funded eCenter network in Kyrgyzstan. The network consisted of partnerships with existing commercial computer centers which provided fee-based ICT services to their communities. The eCenter program temporarily provided subsidized coupons for Internet access and computer training to users of these centers.

Using a mixed-method approach, we found that user-based subsidies have to a certain degree aided financial sustainability by bringing new users to the centers, some of who will, conceivably, become long-term customers bringing ongoing revenues. The subsidies also helped to “kick-start” operations during the initial stage of the project. However we found that the distribution of the coupons did not lead to any significant enhancements to social sustainability by, for instance, encouraging users from under-represented social groups (though we did find that women were marginally more likely to take advantage of the program). Moreover, we found that the distribution of both Internet and training coupons favored more regular users of the eCenters. Finally, looking beyond sustainability to impact within the community, we found that the coupon program had a limited development impact on participating communities. For example, the population of users who reported economic benefits from using the eCenter (eg. subsequent employment or starting a new business), did not make more use of the coupon program than the user population at large, suggesting that the coupon program itself did not account for this benefit.

We argue that, even in the presence of such modest positive effects, user-based subsidies still offer an intriguing model. We believe that if the eCenters had narrowly targeted particular participants for the coupon programs it is likely that the benefits

of the program can be enhanced. For example, better social targeting of the coupons could have brought in more women or under represented groups. From a financial sustainability point of view, explicitly targeting new users (as opposed to people already using the center) could have also been more effective. In terms of impact, coupons could have been distributed, for example, specifically to entrepreneurs looking to start a new business. A method of incentivizing eCenter management to perform such targeting is probably required.

Index Terms — Telecenters, Sustainability, Subsidy, Kyrgyzstan, Central Asia

I. INTRODUCTION

As a method of improving access to information and communication technologies (ICTs), the telecenter is popular among donors and governments in many different countries [1, 2]. The concept of the telecenter emerged from a community driven movement in Scandinavia in the 1980s [3]. For poor rural communities, telecenters can provide access to communication and content. This can include access to market and crop prices, to financial information/services, and communication with friends, family, and business colleagues [4]. Telecenters can also support the delivery of government services [5]. Today, telecenters can be found in many countries and are referred to by a plethora of terms: tele-cottages, public information access points, public internet access points or multi-purpose communications centers. While each of these terms represent slight differences in the object being discussed, the common characteristic of telecenters, as used in this paper, are publicly accessible ICT resources in one or more physical locations that are available with or without fees.

As with any other development intervention, a critical objective is to make the telecenter sustainable. Another objective is to address the problem of poverty and other socio-economic concerns within the community at large; thus a successful solution should also have real impact [6, 7]². However, many telecenter projects have not realized either of these objectives for a variety of reasons such as a lack of income, inappropriate services, little or no local content [8], inadequate infrastructure (power, roads, telecoms, etc.)

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² In fact, a successful telecenter program might be one that has had significant impact (e.g. spun-off a few small businesses) but has no long-term sustainability (e.g. the program transitions and closes after a few years).

particularly in remote areas [9], lack of political, social, or managerial sustainability [10] or the challenge of identifying local and global partners that can move the telecenter to a larger scale [11]. These challenges are enormous and have often relegated telecenter initiatives to the “forever pilot syndrome” [11 pg.11].

Thus, sustainability and impact remain the two principal questions related to rural telecenters. In response, various strategies have been developed to advance the sustainability and impact of telecenter projects. One approach is the provision of subsidies for telecenter users. These are often applied for a limited period and enable the use of ICT services by community members who might not have otherwise been able to do so. While not necessarily a new approach, there is little research that examines the connection between user-based subsidies and sustainability or impact. The question that we wish to explore in this paper is to what extent can user-based subsidy programs promote the sustainability and impact of telecenters. We do this by examining a user-subsidy coupon scheme used by the USAID funded eCenter network in Kyrgyzstan.

The rest of the paper is divided into several sections. First, we discuss issues surrounding the impact and sustainability of telecenters. We then articulate the methodology used in addressing our research question. Finally, we describe the eCenter project, present our results and analyses based on our definition of sustainability and impact, and posit some conclusions.

II. THE IMPACT AND SUSTAINABILITY OF TELECENTERS

As with any other development intervention, a critical objective is to make the telecenter sustainable. Typically, the intention is to make a telecenter financially independent and solvent. This can be in terms of meeting maintenance costs, the recovery of initial investments, acquiring sufficient human resources/staff, or adequate service delivery [12, 13]. Sustainability can also be viewed from a social point of view. Thus, sustainability hinges on having local champions, sufficient community acceptance/awareness and involvement in the running of centers, a range of users that is non-discriminatory and balanced, and beneficiary participation in project design [4, 9]. Additionally, there are political factors to be considered such as accessing local and national political support for the project [5]. This includes having a policy and regulatory environment which is conducive to the development of telecommunications infrastructure and a commercial internet market [14].

Investigators have proposed a number of theoretical frameworks to improve our understanding of sustainability including the critical success factor (CSF) and critical failure factor (CFF) models [15, 16]; the ‘design-actuality’ [17] or ‘design-reality’ gaps [18]; scenario analysis for long-term sustainability problems [19]; economic and financial sustainability models [20]; and political and institutional models that underline the lack of commitment on the part of political leaders and public managers. Previous works by one of us (Best) [5, 10] have presented a sustainability failure

model built upon the work of Heeks and Bhatnagar to help explain why projects that succeed initially, can still fail to enjoy long-term sustainability.

While the problems of sustainability are fairly well documented (and theorized) the ultimate goals of community *impact* (and the measurement and evaluation of such impact) may be less conclusively observed. To date most literature has focused on formative or process evaluation as opposed to summative or impact evaluations [21, 22]. And the literature that does focus on social or economic impact assessments of telecenters to their broader community have yet to demonstrate an absolutely conclusive link (see [23] for a review).

From the above discussion and in tandem with previous research, [see for example 5, 10, 24, 25], we have selected two main dimensions from which we examine sustainability:

1. Financial – This includes the financial independence, business performance, and solvency of the project over time.
2. Social – This refers to the equitable distribution of benefits among target groups, equal access and use, and locally relevant content/services.

In addition, we study the center’s development impact as it extends into the communities themselves. We can observe this in both economic and social forms such as new educational opportunities, community empowerment, job creation, local economic development, etc.

Various initiatives have strived to manage the inter-related issues of impact and sustainability. The literature consists of many general prescriptive reports and descriptive case studies of such initiatives [see for example 8, 26-28]. Others have reported on specific or novel approaches such as incorporating business incubators into the telecenter and sharing resulting profits with the telecenter organization [29]. Another approach is to provide subsidies to a telecenter initiative that is typically applied to initial infrastructure or staffing costs [13].

Alternatively, user-based subsidies can lower the costs that the users themselves pay for services they seek. The hope is that if well conceived, user-based subsidy programs can enhance both financial sustainability (by creating an early flow of income while developing a customer base over the long term) and social sustainability (by providing subsidies that target under-served or over-looked populations, for example women). Additionally, if the subsidies are for activities that are likely to lead to economic, social or political growth within the community at large then the impact of the telecenter should, ultimately, be enhanced.

This approach has been used in a variety of settings including the Cotahuasi Internet Cabina project in Peru in 1997. In that case, the use of the telecenter’s services by local community leaders was paid for by donor funds [4]. Another example of user-based subsidies was the PC3 project in Bulgaria. Pre-paid coupons were distributed in communities where the PC3 centers were located. The main goal was to promote the centers while quickly developing a client base. This helped to reduce the financial risk faced by the new PC3 centers [30]. The eCenter project in Kyrgyzstan employed a similar logic in the use of coupons as an incentive both for the local eCenters and clients.

Table 1 – Targeted and Actual sample size of user surveys by eCenter

eCenter	Targeted Sample Size	Actual number of collected user surveys
Naryn	70	79
Bosteri	50	40
Karakol	75	87
Karasuu	67	70
Nookat	66	72
Talas	22	27
Ivanovka	18	19
Total	369	394

III. METHOD

We employed a mixed-method approach to study the effect of the coupon program on the sustainability and impact of the eCenters. Our research consisted of site visits to all telecenters that were part of the eCenter program; 7 in total. These visits were done in collaboration with local researchers and took place between March and June 2007. Our research instruments included a user survey and interviews with all the center managers, available members of their staff, and local businesses. These data were supplemented by a review of user logs, project reports and updates, and business proposal guidelines.

The user survey consisted of sixty-two questions developed around the issues of sustainability and impact. Specifically it explored how the computer training and Internet coupons were used, the ways users engaged with ICTs at the eCenters, and the perceived economic impact of using the centers. The majority of the questions were close-ended with a few open-ended questions to capture opinions on issues related to the centers.

To determine our sample size we estimated the overall population size as the number of users at each eCenter over the period for which data was available: January 2006 (start of the project) to January 2007. We defined users as those who participated in the subsidy (coupon) program of the centers for either Internet access or computer training. Given this approach, we approximated the total user population at 9,497 people and thus ensuring a confidence level of 95% required a sample size of 369 users.

To identify subjects from each of the centers, user contact lists were obtained from center staff. Users were then randomly selected from each list. In many cases, however, these lists were incomplete with either missing contact information or incorrect contact details. To account for this difficulty, research teams substituted or augmented random sampling with subjects obtained by opportunistic sampling at the eCenters during site visits. In addition, the researchers worked through the social network of users at each site in order to find both previous and current users of the eCenters. Thus, user surveys were first collected using standard random sampling techniques when possible and then with a combination of convenience and snowball sampling.

In addition to sampling the appropriate number of users we also needed to ensure that our sampled subjects were representative of the population across each center. To account for this we stratified the sample size according to the proportion of users from each location.

Table 1 gives the targeted sample size, and actual number of subjects surveyed, for all seven eCenters; in almost all cases we were able to over-sample the population. The one center that was under-sampled (Bosteri) was closed for renovations during the data collection period, complicating researchers' attempts to contact users.

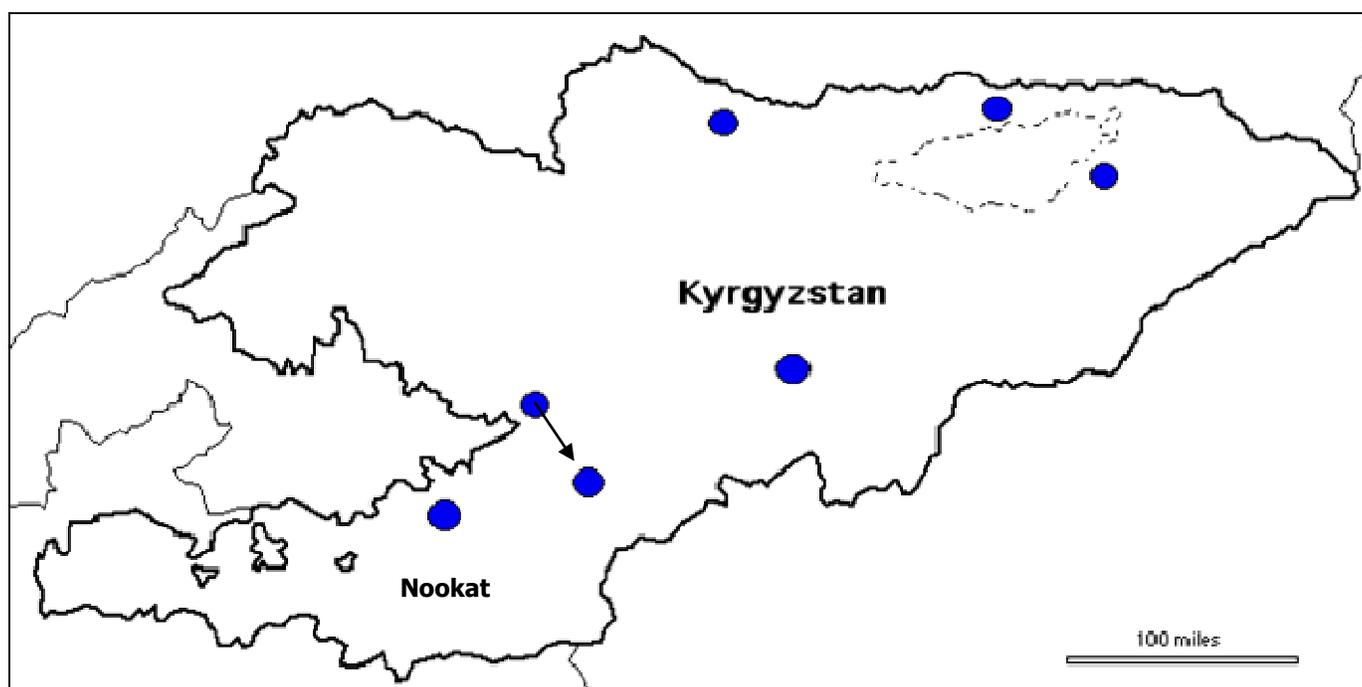
IV. BACKGROUND – THE ECENTER PROJECT IN KYRGYZSTAN

Kyrgyzstan is a small Central Asian country that was part of the former Soviet Union. Although it is landlocked with limited resources, it has achieved economic growth of around 4% between 2000-2005 [31]. Nevertheless, the poverty rate continues to be of major concern. The national estimate of people living below the poverty line was 43% in 2005 with larger percentages in rural areas [32]. In addition, the unemployment rate was estimated at 8.1% in 2005, with 13% in urban areas [32]. This implies that a significant part of the population, though employed, is still poor.

In 2002, the government approved a “National Strategy for ICT Development in the Kyrgyz Republic” as part of its plan to use ICTs to address development issues. In general, this emphasis follows what Ure [33] notes is a more open approach to the diffusion and use of ICTs by the Kyrgyz government when compared to its neighbors. However, the growth of the Internet has been hampered by the monopoly held by the state telecommunications company Kyrgyztelecom, which is deeply in debt to the World Bank and seeking to return to profitability. One consequence of this is that Internet subscription costs are high relative to average incomes. Recent estimates put Internet user rates at a relatively low level of 13.3% [34]. In addition, PC ownership was estimated at 10.4% [34]. Given the larger social and economic context, Internet access via private, home-based means is not likely to grow substantially anytime soon and outside the capital, public access is limited, expensive, and usually not fast. Given the problem of poverty and the acknowledged importance of information resources for economic development, the need to provide alternatives to private use and to enhance public ICT venues was viewed as important.

The eCenter Project

The eCenter project was launched in Kyrgyzstan in July 2005. It was funded through the Last Mile Initiative of the United States Agency for International Development (USAID) that seeks to promote greater access to information and communication technologies, particularly in rural and underserved areas. The goal of the project was to augment and network a group of telecenters across the country with the aim of promoting local economic development. Each telecenter was established within a pre-existing business. In this way, the



centers sought to improve local access to ICTs, stimulate local business creation, improve computer skills, and increase opportunities in non-traditional employment training and job creation among the local population. The local project manager in Kyrgyzstan was the Civil Initiative on Internet Policy (CIIP)³, a Kyrgyz non-governmental organization that focuses on the promotion of civil society interests in the development of national ICT policy.

The project ran from July 2005 to September 2006 with a total budget of US\$390,000. During this time, a group of seven eCenters were established across the country (see Fig.1):

1. Karakol
2. Bosteri
3. Naryn
4. Nookat
5. Karasuu/Osh⁴
6. Ivanovka
7. Talas

Each of the eCenters provides a variety of fee-based services including Internet access and email, printing, scanning, copying, faxing, multi-media services and IP-telephony. The exact suite of services offered varies from center to center. Each center also delivers a curriculum of computer literacy courses which consist of several modules: Windows, Microsoft Word, Microsoft Excel and using the Internet. Additionally, some centers offer accounting courses and one offers leadership training.

Table 2 lists the estimated number of competing Internet cafés within each of the seven communities which had eCenters. It also includes the total estimated population size

for those communities. These figures help to sketch the overall competitive landscape of the centers. By looking at the number of employees we also get a sense of the relative size of each establishment. Note that while this table focuses on Internet provision there were also other businesses providing related business services such as printing or photocopying.

eCenter	Employees		
Karakol	7	10	64,322
Bosteri	4	0	12,000
Ivanovka	6	0	20,000
Talas	3	2	32,638
Nookat	4	0	30,000
Karasuu	3	0	19,143
(Osh)		(80)	(220,000)
Naryn	4	10	40,050

User-based subsidies

There were two main components to the eCenter program. First, there were subsidies granted to the eCenters for the provision of computer literacy/accounting courses and second, free or discounted Internet access was offered to local community members. The subsidies for computer literacy or accounting courses came in the form of reimbursements to the eCenter operator for the training costs of those who passed each course. People were able to participate in the courses by receiving coupons. Similarly, Internet access was subsidized through the use of five-hour coupons that were distributed to users. The subsidy level on both the computer training courses

³ See <http://www.gipi.kg/> for an overview of CIIP.

⁴ The Karasuu eCenter moved to Osh city in April/May 2007.

and Internet coupons changed over time. Subsidy amounts were reduced 20% each quarter; thus while the project paid for 100% of the cost of a training course in the first quarter, by the fourth quarter it paid only 20% of the cost and required the user to pay 80%.

Partnering with local businesses

Each eCenter was established as part of an existing local business rather than through the creation of new centers. Suitable local business partners (including pre-existing telecenters) were selected through a competitive bidding process based on criteria such as related prior business experience, existing level of investment, relevant telecom experience, and the potential for further expansion of programs. Subsequent to a center's selection, CIIP provided technical support on the use of the subsidy program and delivered training to the business owners and their staff. While some of the selected eCenter sites were already providing Internet services, others were engaged in computer graphics and photocopying services, gaming, computer repair or providing computer training courses.

There was one final component of the eCenter project – a land grant program where suitable land for investment in office space and technological parks could be linked to each eCenter. It was envisioned that such investment would be supported by the success of the eCenters; this component of the project, however, did not achieve expected outcomes and was eventually dropped.

While there are several interesting aspects to the eCenter project as a whole, we have focused only on the user-based subsidies in this study. The following sections present our findings and analysis of the user-based subsidies component of the eCenter project.

V. THE SUSTAINABILITY OF THE eCENTER PROJECT IN KYRGYZSTAN⁵

Financial sustainability

All the eCenters enthusiastically implemented the coupon program and several have since sought to expand their offering of ICT services by increasing the scope and size of their businesses. In all cases, the businesses stated that their financial situation was better off following the change to an eCenter. On average, according to the managers this transition increased their revenues by an estimated 57% (with a low of 15% reported at Karakol and a high of 100% reported at Talas). In addition, almost all of the center managers agreed that their clientele increased (some very significantly) after becoming an eCenter. The main sources of revenue varied from center to center and were based on local demand. For example, Internet access was reported to be the main source of revenue in only two of the seven centers. Other revenue sources included computer training, typing services, IP telephony and the sale of mobile phone credit.

⁵ Statistical results mentioned in this paper are all significant to at least the 0.05 level.

The managers themselves were quick to praise the eCenter program and saw a direct connection between their success and the use of the coupons. Some of the managers estimated that 70-90% of their current customers would not have come to the center without having been part of the coupon program. Interestingly enough, a significant percentage of users did not actually rely on coupons. Of those surveyed, only 54% and 43% reported actually receiving coupons for Internet access and computer training respectively. This implies that perhaps the managers had an exaggerated belief of the effect of the coupon program on their businesses. When asked if they would have used the eCenter services if there were no coupons, approximately 47% of respondents said yes and 19.5% said they would not have used the center in that case. It should also be noted that the subsidies were only provided for a limited period. Thus, by the end of the project users were paying for the full cost of Internet access and computer training.

The existing competitive environment (Table 2) appeared to influence the scale of impact of the coupons. For example, we found that if the manager identified more competitors in the immediate community, the eCenter users were more aware of and more likely to have used other cyber cafés. If there were fewer competing centers in the catchment then users were more likely to have used the eCenter prior to the coupon program. In other words, when the level of competition was heavy the coupon program was more successful in drawing in new users.

In general, 66% of those who received Internet coupons had used the eCenter before while 33% of those who had received a coupon had not used the eCenter before. The results are very similar for training coupons. Thus, during the subsidy period, coupon use was associated with the introduction of new users, which can contribute to financial sustainability.

It should be noted that the decision to partner with existing and successful local businesses was also important for the success of the project. Generally, there is little evidence to suggest that the one-off donor grant approach can work [24] and so some have argued for a business centered approach to telecenters [13]. The rationale behind this approach is that the profit motive can promote financial sustainability. In the case of the eCenter project, it was in the interest of the local business partners to make sure that their centers remained in operation and were successful. The coupon program supported the partnership with local businesses by ensuring a sufficient number of customers during the initial subsidy period. It was critical therefore in “kick starting” the operations of the centers after which several of the local business partners were able to use this momentum to expand their businesses and tailor their suite of ICT services to their community needs.

Social Sustainability – Types of Users

We examine social sustainability primarily in terms of the equitable distribution of benefits, access and use within the community. Ideally, a more balanced and representative user base should represent broader community acceptance of the center and limited social exclusion. Table 3 below summarizes the general user distribution across the various centers. We

found that the majority of users were women except in Nookat where the more traditional culture in the south seems to limit female participation at the eCenters. The majority of users in the sample were typically young, suggesting the propensity to use ICTs is linked to age particularly where the general diffusion of such ICTs is low (i.e. rural areas). This young user group is consistent with a nationally young population (31% below 15 years in 2005 - [35]) and also partly explains the low marriage rates among our sampled population. In general, older customers used more of the basic ICT services such as photocopying or printing and requested the assistance of younger persons or staff to help them when using the Internet. Older users (above thirty years) were, however, just as likely to attend training courses. The education rates are similar to those nationally. Also, the user distribution was approximately proportional to the religious and ethnic composition of each community

Table 3 – Summary of user characteristics

eCenter	Male %	Female %	Avg. age	Bachelors or higher %	Married %
Karakol	44	56	21	48	10
Bosteri	25	75	18	10	3
Ivanovka	53	47	18	5	0
Talas	33	67	23	15	19
Nookat	67	33	24	24	39
Karasuu	41	59	21	30	14
Naryn	31	69	24	47	25
Total for all users	43	57	21	32	19

Social Sustainability – Targeting and Distribution of Coupons

Based on the above characteristics, we found few statistically significant differences among users who received coupons and those who did not. Among those who received Internet coupons approximately 51% were female. This could have had a marginal effect on the larger proportion of female users at the centers overall. Other variation in user characteristics (ethnicity, educational level, etc.) among those users who benefited from the coupon program and those who did not were not statistically significant. Also, there was no difference between those who got Internet coupons and those who did not in terms of their perceptions of the importance of the Internet to their jobs or schools. In terms of the training courses there were also no discernable demographic differences between those who received these coupons and those who did not.

What was different was whether or not the respondent had used the eCenter prior to receiving the coupon. As mentioned above, 66% of those who received Internet coupons had used the eCenter before. Similarly, 60% of those who received training coupons had already visited the eCenter. This suggests that prior users were in a better position to learn about the program and participate. The concern is that while the coupon component of the project is now complete, the opportunity to attract larger numbers of new users to ICTs might not have

been exploited completely. Thus while the eCenters have financially benefited from the coupon program; the long term social sustainability of the project may have not.

Two factors could help explain this type of coupon distribution among users. First, the implied goal of the project was to focus on persons who had the least access to the Internet and computer courses. However the way the coupon program was operationalized did not appear to be systematic or consistent across centers. Moreover, the eCenters received no particular incentives to narrowly target users and so some may have simply distributed their coupons to people already at their center. Thus, there was a significant difference among receivers of both Internet and training coupons from center to center though there was no discernable pattern to these differences.

Some centers seemed to offer coupons to whoever was easily available. Indeed, some were more concerned with issuing the coupons rather than targeting and as such relied on informal means of distribution. One example of this is a neighboring Internet café owner in Karakol who said he received a training coupon for the computer literacy course. He was already exposed to more advanced computer courses but still chose to attend the eCenter course since it was free at that time. Alternatively, more formal means of distribution were used at other centers. For example, in Naryn the intention was to target as wide an audience as possible. This was done through advertising in local media and actually did result in lines literally going out of the door of the eCenter. However, it is unclear what type of users this form of marketing attracted.

Second, the eCenters were encouraged but not compelled to give one Internet coupon per person, so as to increase the reach of the program. This suggestion, however, was not generally followed. For example, in Nookat users were given one coupon per quarter since, according to the manager there, it was difficult to continually find new Internet users. Alternatively, in Karasuu the strategy was one coupon per individual. Thus both targeting and distribution seemed to be dependent on the individual eCenters and was the result of a compromise required to enable a private business to undertake socially oriented goals.

VI. DEVELOPMENT IMPACTS OF THE COUPON PROGRAM

Internet Access

Although this represents a preliminary and indirect impact of the program, the Internet coupons did, of course, increase access to the net among users. This access can be viewed as a form of impact. Indeed, in most cases overall access increased in participating communities. For example, several of the centers are located in rural areas with limited access to ICTs. Thus, the introduction of the eCenters helped to meet the latent local demand for ICT services and training. Given the relatively high subscription costs for the Internet, this also meant that the eCenter could have been the only source of Internet access for some users. This was the case in at least three of the communities.

For many, the communication function of the Internet was most important, particularly where regular post mail services

were infrequent. The most common online activities were sending/receiving emails and instant messaging. Other important uses included reading news, doing school related work/research, downloading music and participating in chat rooms. Several users proffered experiences of how accessing the Internet had helped them keep in touch with friends and family abroad, support their work and even religious education.

Finally, in addition to providing increased quality or availability of Internet access, the eCenters have also been an important place for users to gain Internet-related skills. Approximately 70% of those who received Internet coupons said that they had learned to use the Internet at their eCenter.

Development Impact – Computer training

The acquisition of relevant skills is a clearer form of community development impact and the eCenters provided computer training courses which were well received by participants. Perhaps more than anything else, participants in training courses were quick to inform us of the benefits of receiving the computer literacy training. The courses were basic and allowed the centers to bring those with no understanding or experience with computers up to at least a foundational level of use. Completion was contingent on passing an evaluation which tested their ability to use the computer and some of the Microsoft applications they had studied. The majority of trainees were able to pass the test; the failure rate was approximately 10%. For many users there was a sense of pride in completing the course.

For many, these courses provided the basis for the acquisition of job-related ICT skills. Eighty-five percent of all respondents stated that they acquired important job skills from their eCenter. Furthermore, some users reported actually getting jobs (usually clerical) based on these skills. Approximately 15% of all users reported finding a job as a result of using the eCenter. As noted earlier, the country has a high national poverty rate of 43% and an unemployment rate of 8.1% (2005). Therefore such impacts from the program, though small, will be valuable to both the unemployed and the working poor. We did not find, however, a link between users who participated in the coupon program and those who reported finding jobs due to training at the center.

Approximately 61% of trainees who received user-subsidy coupons for their classes said they would pay for the service if there was no subsidy, demonstrating the value placed on the services and experience provided by the eCenters. Many of the eCenters are in fact planning to continue and even expand their course offerings past the lifespan of the subsidy program. For at least one eCenter this is also the main source of revenue. Content was an important factor in promoting the demand for the computer literacy courses. Much of the design and content for the courses came from the initial demand studies done prior to the start of the project. However, a few users suggested that having completed these courses they now want the center to offer more advanced computer courses. Continually modifying content to meet the needs of users will be a factor in supporting long term development impact.

Development Impact – Local economic development

In terms of local economic development, we observed two types of impacts related to the introduction of user-subsidies at the eCenters. First, the eCenters have stimulated the local market for ICT services. For instance, there are approximately ten other commercial computer centers in Naryn that were established after the eCenter opened its doors. Second, the opposite is also possible. In Nookat, prior to the introduction of the eCenter there, there was one other business offering Internet services. This closed soon after the opening of the eCenter as it could not compete with the initial subsidies being provided for Internet access. That other business now operates as a café.

One of the objectives of the eCenter project was to support local business development. Of all users, only 5% said that they were able to utilize either the facilities or courses at the eCenter to establish a new business. Most of the businesses were located in the services sector and a few specifically in the ICT sector. Of these users, there were no significant differences in terms of gender or levels of education. They were not necessarily in a higher income group either; for example they were no more likely to own a car than those who did not start a business. Finally, in terms of coupon use, there was again relatively little difference between those who reported starting a new business and those who did not.

Whether we refer to the efficacy of the training courses or improved Internet access, one qualifying factor to note is the initial limited diffusion of ICTs in the targeted communities. This initial lack of ICTs in these mostly rural/semi-urban communities meant that the potential for the subsidies to have some modicum of impact was there from the start. We cannot be sure whether the development impact would be similar in other contexts. However, we can indicatively point to the example of the eCenter in Osh city where there are some 80 other cybercafés, various documentation centers, and in general better infrastructure for the delivery of ICTs. In an environment such as this, the eCenter modified its strategy to focus on the provision of training courses as there were few organizations providing this service. Thus, the business focus of the eCenters coupled with the goal of providing relevant ICT services to targeted communities can potentially create an impact in a variety of contexts.

VII. SUMMARY AND CONCLUSIONS

The eCenter program provided subsidized coupons for computer courses and Internet access to users of already established commercial computer centers. Thus, the center owners provided the physical infrastructure for each eCenter and the subsidies helped them to access, and ostensibly expand the local market for training and Internet services. The project, therefore, represented a merger between public goals of increasing ICT access and literacy and private goals of increasing profit and market share.

We focused on the subsidy component of this project, as an innovative approach to telecenter development. As such we attempt to address a gap in current research by exploring the relationship between user-based subsidies and the

sustainability and impact of telecenter initiatives. In this case we examined sustainability in terms of its financial and social dimensions. By financial sustainability we look at an eCenter's financial independence and solvency; by social sustainability we are primarily concerned with the distribution of access and benefits to the community. There are of course other dimensions that could have been included, but we wanted to limit our analysis in such a way as to make it focused and useful.

In terms of financial sustainability, we found that the coupon program brought some new users to the centers during the subsidy period. Self-reporting indicates that a third of Internet coupon users and 40% of the training coupon users were new. More importantly, 19.5% of users stated that they would have not have used the services of the eCenter without the coupons. The coupons also helped the local businesses thrive with customers during the initial subsidy period; it was critical, therefore, in "kick starting" the operations of the centers. Thus, we argue that the coupons have to some degree aided financial sustainability by bringing new users (and therefore additional revenue and an expanded long-term customer base) to the centers and creating a stable source of income during the initial stage of operations. Obviously, temporary subsidy programs may actually weaken long-term financial self-sustainability as the program winds down. But in this case, while we observed the end of the program we did not find evidence for an immediate financial downturn.

In terms of social sustainability, the distribution of the coupons did not lead to any significant differences in the type of users except a marginal increase in female participation. We find that the distribution of both Internet and training coupons favored more regular users of the eCenters. This implies that the opportunity to expose as many new users as possible to ICTs may have been missed and this could have limited the wider social impact of the project. One of the main reasons for this was the lack of effective targeting strategies among the centers.

Finally, the coupon program had a limited development impact on participating communities. One preliminary impact was the enabling of Internet access for users and the learning of Internet related skills. The coupons also facilitated computer skills training. However, among those who reported economic benefits (subsequent employment or starting a new business) after acquiring these skills, there was little or no difference between those who had been coupon recipients and just regular users who had not availed of the program.

We suspect that as the targeting and distribution was left up to the local eCenters, there might have been less emphasis on sustainability and impact and more emphasis on short-term profit. We argue that both the sustainability and impact of the coupon program could have been improved with a more focused targeting strategy. For example, better social targeting of the coupons could have included more women, particularly in the more traditional areas of the country, or other vulnerable groups. From a financial sustainability point of view, targeting new users could have also been more effective. In terms of impact, coupons could have been distributed, for example, specifically to young entrepreneurs looking for skills or access

to grow their businesses. Future user-subsidy programs should examine ways to incentivize the local center managers to design and implement targeting programs that enhance social and financial sustainability as well as overall community impact. Additionally, some broad parameters and techniques to this targeting could be developed centrally and offered to participating center managers.

Even with decades of worldwide experience constructing, operating and evaluating telecenters, the research reported here makes clear that the often cited preeminent goals of the telecenter movement – socio-economic sustainability and substantial community impact – remain difficult to obtain. Further experimentation with models and approaches, along with close observation and continued independent assessment work, is required if we are to realize these ultimate ambitions.

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