

# Rural Livelihoods and Income Enhancement in the “New” Economy

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## ABSTRACT

Technology alone, however innovative or even “cheap” is not the solution to poverty, illiteracy, infrastructural inadequacies and the myriads of ills of those below the poverty line in the third world. The ability to utilize technological advances to meet developmental goals is critical. This paper brings an in-depth case study that illustrates the success of a program for poverty reduction that judiciously integrated some basic computing and communication facilities with education, training, entrepreneurship and lifelong goals to bring higher levels of prosperity to villages of one of the poorest segments of the world.

## 1. Introduction

Technological advances of the past century have completely changed the way people live and work. Information Technology and ubiquitous Internet have made it possible for people to cross barriers of geography and work cohesively in different locations. But all of this has impacted only what is known as the “developed” world, and even in the developing economies, the “cream of the crop”, the top 10% of the country’s population who have the education levels and resources to utilize their skills and technological prowess.

Technology has been much touted as one of the effective levers that promise to bring more prosperity via information exchange for the world’s impoverished. Can it serve the needs of those for whom earning the bare minimum of a dollar a day is a daily challenge, perhaps a billion people on this planet?

This paper presents a different and counter-intuitive perspective on a successful deployment of a large-scale effort to enhance the lives via income escalation, of a large segment of an impoverished population. For them the end run is, not to participate in social networks, watch Internet videos or blogs but to enhance income. This is an example of how technology can be used for social gains where there is a merger of various streams like social sciences, business management and information technology, while placing the needs of the community at the center of interest.

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## 2. The Context Setting

The mention of India to-day conjures up the picture of an IT-skilled country with large back-office support hubs in cities like Bangalore, Delhi, and Hyderabad. Considered the home of computer talent and the bastion of the outsourcing craze - it is much hyped as a country on a major economic upswing - a third-world country which has transformed population into a hip-urban community.

The reality is quite different, as the census figures of 2001 [1] show. Only about 13% of the billion residents of the country live in large urban areas and even fewer enjoy western style education, technology and amenities. The rest of them live in the mid-tier cities as well as in the 600,000 villages, the real India, with incomes barely above the “dollar a day” definition.

In terms of technology the national government focused on increasing rural connectivity both through Internet and Cellular bandwidth expansions. In India, cell users in urban areas are taxed by the federal government to help build a corpus fund called “Universal Services Obligation Fund” [12, 13] which is then invested in infrastructure for cellular coverage in rural areas. At one time this fund accumulated to almost \$1 billion, due to lack of viable investment opportunities.

In parallel, another scheme under the E-governance initiative is the collaboration of national and state governments and private corporations resulted in the deployment of “Information Kiosks” to each of the 600,000 villages in a Public-Private-Partnership model, providing citizen services, at an estimated investment of \$400 million surely that should go a long way to mitigate the poverty levels .

“Information technology is a key mechanism for addressing the knowledge asymmetry between the governments and governed” says Nandan Nilekani in his book “*Imagining India*”, [3] but can that happen if citizens have neither the ability to read nor to operate a computer? Only the operator driven information kiosk can then perhaps fulfill this gap.

Note the computer usage model. An information kiosk is essentially an Internet-connected desktop computer, shared by a large number of people. This reality is significantly different from the concept of “personal computer”, a single individual with resources to own a computer. A computer here is a scarce resource that is operated by a few that can grapple its linguistic and technological intricacies often an intermediary, or an

operator who can translate the benefits of access to information for the rural communities.

Not surprisingly, the cellular usage (based on voice communication), which provide human-to-human communication abilities and keeps families and friends in touch has grown exponentially, overtaking the revenues from urban usage to those in the rural sector. But usage of cellular data for internet usage has shown little rural penetration. And while this is the case for India, most underdeveloped regions show similar patterns. But are these statistics a reflection of the true impact on the rural communities – be it economic or social?

How can we assess the real economic benefits?

### 3. The Specific Geography

The setting of this case study is one of the poorest sections of the world called the “Sunderbans” (see Wikipedia for location) part of the world's largest delta (80,000 sq km or 30,000 sq miles –slightly smaller than the state of Indiana). Sunderbans is a World Heritage site of UNESCO, which straddles the countries of India and Bangladesh. This case study was limited to the Indian part (due to political considerations) of the Sunderbans which has a size of about 2,500 sq. miles (size of Delaware) and home to about 5.4 million people making the population density very high for a rural area.

The Sunderbans have no cities, just scattered villages and islands where there are settlements. The area produces fish, timber, agricultural produce, honey. There are hardly any industries in the area and even the local harvest produce and fishing is shipped to the urban areas for further processing. The per capita income of the inhabitants is largely unknown; the (untrustable) reported figures show 37% living below the poverty line quoted at the figure of \$1/day.

Many young men have not completed their education as they cannot attend schools regularly due to long sailing trips on fishing trawlers where they work as hired labor as sole breadwinners in their family. Older male members are most likely to have lost their lives in these precarious means for earning a livelihood. For those who are lucky to have the means to an education, there are schools and even many government run “colleges”. But the quality of education is poor and the medium of instruction is only the local language. At the end of the course, even the so-called *college graduates find it hard to find a suitable job, since they have no particular skills and no exposure to computers*, considered a basic tool at the workplace of to-day.

In the developed world it is almost incredible that someone with a college degree, does not have a basic familiarity with computers, but those familiar with rural India, and perhaps other developing economies will know this to be a reality leading to the coinage of the term “digital divide”

Making logistics harder, this particular area is characterized by a network of waterways (natural artifact of swamps) which makes travel and communication infrastructure difficult and this has been the reason for lack of industrial development in the area. The area is also prone to devastating cyclones, like the Aila that hit the region last year. The bottom line being:

- Extreme poverty and lack of basic infrastructure.
- Almost complete lack of civilization basics such as electricity, telephones. But, due to government investments,

cellular service (voice and data) is available in some zones (data is unused).

- Travel is tedious, time consuming and dependent of availability of local boats and suitability of weather.

### 4. Our Approach

Our aim was to deploy technology to benefit the people of this region, but before embarking on any project it was decided to commission an ethnographic study in 2005 to study the impact and needs of the community and the viability of the project—much like the Requirements Analysis or Feasibility assessment used for a Systems Project.

This information needs analysis was carried out by Reuters Foundation/Stanford University in collaboration with a team from Actionaid International (an International development agency) [2]. The study attempted to understand the impact of the problems on the local community, with relevance to the various issues facing them – like food, health, education, governance, livelihood, disaster preparedness and gender. A participatory evaluation was also carried out to ascertain their priorities on how Information and Communication Technologies could be used to address these

The outcome of the study revealed some startling facts! The major area of concern of the people was the *livelihood insecurity*, not any of the other issues which we had assumed would have a greater impact. The people we interviewed felt that if we address their income enhancement need they would find ways to address all other issues.

Their primary concern was the lack of access to opportunity in the economic growth due to lack of skills and capacity among the youth in this region. The rural youth, even with degrees did not have access to jobs as these degrees were academic and did not give them skills for the workplace.

This helped define the goals for the project later undertaken by Anudip Foundation

- Create “new” economy livelihoods for the people in rural areas.
- Reduce migration to urban centers and create economic growth for rural areas.
- Utilize the investments made by the government organizations for wealth creation opportunities.
- Explore the IT usage model of many people accessing information through a single information access point (Info Kiosk) via skilled intermediaries.

Our target is to create livelihoods for 100,000 unemployed youth in rural India through our initiatives in the next 5 years.

#### 4.1 “What if?”: An Approach to Failure

It is interesting to note that initially we had embarked on a technology inspired plan. The focus was on Communication Network with integrated Disaster Warning Systems – for the fishermen.

Our approach was to start by laying the infrastructure of communications to this swampy, disconnected land. The idea was to use marine radios, overlaid with digital communication hardware to create a mesh network. This network would be gateways into the Internet at appropriate semi-urban access

points into the telephone-DSL system. Internet Kiosks and shared computers would be placed in villages and possibly even on deep-sea fishing boats to provide a whole slew of life saving information access functions (weather and hurricane warnings, human communications and so on).

The idea sounded innovative and attractive the mesh network using radio communications would enable digital transmissions where there are no communication wires. Internet and communication access (VoIP for voice) would be enabled in really backward lands.

Some startling facts emerged - the deployment of such a system *would have been a failure*:

- The cost of this system would be prohibitive and even higher would be the cost of maintaining the system. *There is no local talent* – people who know about wireless communication and internet configurations would be expensive to transport and house in these locations.
- Government regulations controlling security of wireless networks in this region which is a “border area” would be hard to overcome, and hence the deep-sea fisherfolks would not be able to access such a system.
- At the end, there would be Internet access, but what use would that be to people whose focus is attaining income?

#### 4.2 The Education and Economic Approach

Technology is viewed as cheap, but that is from the perspective on \$100/day income earners. In the bottom end of third world society is it expensive stuff. Even more expensive is the cost of running, maintaining and repairing the infrastructures. On the other hand, unskilled labor is dirt cheap. Even semi-skilled or even skilled labor is very cheap.

The idea is to leverage the low cost human capital. Using a few well educated people (not cheap) we can educate literate people to become trainers. Then we use these trainers to instill basic technical skills to people in order to turn the unskilled into cheap but more skilled human capital. The process of course consumes little money but enhances the income potential of the \$1/day strata of society into almost a \$5/day productive people. Of course, entrepreneurship breeds further employment prospects that are then propagated economically.

Even this approach has its pitfalls. All the barriers or logistics, lack of infrastructure, travel problems, legal barriers and so on, have to be overcome. We were able to do that.

The training delivery cost is nominal as each training program is delivered by 2-3 trainers/ hardware support personnel with a monthly salary of about \$300 (*indeed, personnel costs are low but this figure amounts to \$10/day, ten-fold higher than \$1/day*). The computers have been donated and the students (a batch of 20) contribute about \$6 towards the running costs of the program. Thus even with administrative overheads of travel to rural locations and stay costs of \$250 per person per program and the cost of course preparation and other management costs; the cost per program works out to \$2,000. This averages to about \$100 per student, a far cry from the millions of dollars invested in technology led so called innovative projects!

As we show later, we did achieve the goal of developing enhancing income potential worked at various levels. In addition to placing graduates in jobs in cities, our entrepreneurs are running businesses in the hinterlands and making about \$5/day.

#### 4.3 Basic Skills Training

We made the obvious decision to focus on basic computer education first. Unlike regular vocational training programs however, this plan would focus on the total development of the youth from the time of enrolment to the phase where they would be in a position to have a sustainable livelihood. We undertook creating core computer curriculum for youth with basic high-school education and delivering this in the rural areas.

The courses cover computer usage, computer hardware, basic applications, internet access and browsing, email and searching, software configuration and maintenance and such other skills. The courses were first developed in English with textual material, slides and exercises and assignments from industry. We use CDMA data connections where available, judiciously – to avoid increasing costs.

The students, local youth with elementary education can read the English alphabet but have a poor understanding of the language. Hence all the material was then translated to *Bengali*, the local language, and this improved the understanding of the conceptual background and aids faster learning.

Geared at dropouts with no employment, who have never seen a computer before, the courses start with how to switch on a Computer and take the students through the basic operations in MS-Paint, MS-Office and so on.

The courses are trainer-led, though supported with slide projection allowing an audio-visual approach to the training, and ensuring that there is some standardization and quality of delivery is consistent. These are delivered in an intensive hands-on manner which allows the trainees to attain a level of skill in the period of 30 days. The first 15 days of lecture-cum-hands-on session is guided by our trainers. These are followed by 15 days of practice sessions where the trainers provide part-time supervision, thus allowing the students to acquire knowledge, perform independent troubleshooting and develop operational skills - leading to a high level of confidence. A system of evaluation is used to provide feedback to the students and along with certificate of course completion,

#### 4.4 Job Placement

Due to the lack of communication infrastructure in this region, most of the time even those willing to work in the cities are excluded from the information network and do not receive the information on job openings in time for them to send the applications. We populate a database of the trained students and make their profiles available to prospective employers.

The database thus helps the employers to locate them quickly and inexpensively. There is also a two-way communication, for those students who are registered. The job openings and matching is then handled via a “two-way” communication system using text messages. This reduces the lead time for information to reach applicants, allowing those in the far remote locales to respond to opportunities where they would not have been able to.

#### 4.5 The Entrepreneurship Module

But not all the trainees are able to find employment at the end of the Basic Skills training courses. Since local employment opportunities are minimal, only those who are able to migrate to the nearby urban areas can actually stay employed. For young

women, where society does not allow them to travel outside the local geography, this forces them to be underemployed.

Hence to develop economic progress in the rural areas, we followed the basic module with advanced modules on entrepreneurship development for setting up a rural micro-enterprise using the computer as basic tool. This training covers the basics of starting a business, Accounting, Financial Management (including where to get access to funds, how to open a bank account), marketing and similar areas. This helps the students to set up shop on their own and offers an income generation option, preferred over traditional livelihood which is agriculture based. Further skill training is also provided for the type of business that the entrepreneur would like to do. These courses have been developed with inputs from the needs for the services in the rural geography, based mainly on the feedback received from the rural community members themselves.

Advanced training is provided in the following lines of business which are popular in the rural areas: (1) Desk-top Publishing (2) Digital Photography and Video editing (3) Cyber Café Management and (4) Accounting.

## 5. Real Life Case Studies

Since Anudip's establishment in 2006 it has grown to employ 41 trainers and graduate about 2500 students. The plan is to increase the number of trainers and students significantly in the coming years, subject to availability of funding.

The following are real life entrepreneurship examples that have emerged. Many of our trainees have migrated to cities, but some especially women are pioneering rural commerce. At the moment the number of successful small-business operations is limited, but we are anticipating growth as time progresses.

### 5.1 "Missed Call" Communication

One of the interesting features of these entrepreneurs is that once empowered with the skills they are quick to find innovative use of the voice technology of the cellphones to acquire and retain rural customers at little or no cost to themselves, through the customary use of "missed calls". What is a missed call? In India especially among the low income communities who have a cellphone but do not wish to pay charges, a novel concept is the use of a call given to another number where the caller hangs up before the called party can answer. This indicates a pre-determined message and sometimes even the message can vary depending on the number of rings the caller allows. Much to the bane of cellphone service providers a large number (about 40%) of all calls in India are missed calls proving that given the backbone, people are able to find innovative use of this without any additional cost. But quick to understand the opportunity and adapt the cellphone operators have moved to a business model where the increased numbers of connections for cellphone users bring in larger revenues.

### 5.2 Digital Graphics Studio

Five young women started this unit at the local market at 'Raspunja village in May 2007 after completing IT Basic and Advanced training in desk-top Publishing. They started with two computers, one printer and one scanner and one digital camera under an incubation financing model. Their initial struggle was against the social barriers of unmarried young girls entering into the uncertainties of a business -- but their confidence in their own skill and capacity makes them a profitable venture to-day.

Their platter of services provide a low-cost option to the community

- Digital photography and passport photo printing
- Old photo touch up
- Typing both English and Bengali
- Printing of business card, brochures, school question papers, publications for the local administrative authority and so on.
- Design and printing of greeting cards, marriage invitation cards, banners.

The local community has benefited from the services provided as they would have no option other than to lose a work day and pay for the travel to the city to obtain the same services. Now all they have to do is drop in to the shop at the local market to take a photograph and when it is ready a "missed call" tells them that their order is ready for picking up.

### 5.3 "Power House" - Internet Ticketing

Power House is been set up as a Cyber Café a group of youths in a in a marketplace at South Barasat, a remote village using one CDMA connection. Most people in the region are of course not aware of the types of services that Internet can offer. Quick to understand the potential after the training course, the group has set up the services to book *railway tickets* for the local villagers. The service charges are about \$1 to \$2 for train ticket booking and ticket printing. In this remote village, people would earlier need to go to urban locations for this service. Many of the villagers are not literate and this meant not only loss of work days, transportation costs to the city but also left them open to exploitation by unscrupulous touts in the urban areas (illiterate people are easily swindled).

Now they simply walk into the local cybercafé or perhaps even call the operators and request that bookings be made. A "missed call" informs them the ticket is ready for pickup. The villager pays in cash; and Power House uses a prepaid wallet system (ItZ card) to pay online. This is a different model than an individual user at a PC with a single credit card and making own travel plans! Essentially this model works more like a hub and spoke and the reach of a single computer and Internet connection can be multiplied to cater to a *whole village*. The two owners now make about \$5/day each.

### 5.4 "Sadhana" Cyber Café

"Sadhana" is another entrepreneurship unit set up as a Cyber Café, by a couple of our trainees, the first in the area. The students of the nearby college have been quick to seize the facilities, giving rise to further systemic spread of knowledge. After preliminary coaching by the owners of this Café (for which the college students pay a fee of \$0.50 per hour, they have started creating e-mail accounts and can also apply jobs online, and enter for competitive examination for government jobs. Job seekers, unemployed youth and students are now constantly surfing the net (cost \$0.40-\$0.60 per hour),

The local elder community has also realized the benefits of an email over the ubiquitous postcard especially when there are family emergencies (death, sickness, financial support) and bread winners located in urban conglomerates like Delhi or Mumbai have to be informed quickly. Old lady "Moni" communicates with her son, a chauffeur in Delhi on email, and

insists on paying the \$0.50 to possess her own email account, rather than use the common one at Sadhana Computer.

Sadhana Computers has invested in just 2 computers and is linked to the Internet through a CDMA data connection. The capital outlay for Sadhana was \$1,000, obtained as a loan that is serviced through a revenue of \$20 per day. The revenue minus loan and operation costs, i.e. the profit, amounts to over \$5/day per owner, and is a five-fold increase over the \$1/day income that would be considered normal.

### 5.5 Friendly Neighborhood InfoCenter

The government offered to support, under the E-governance funds [14], facilities such that entrepreneurs could set up centers where local communities could access web-based government services.

In the village of Urelchandipur, it was almost impossible to find someone met the mandated eligibility criteria of basic familiarity with computers to become an "Entrepreneur", under this program. One female graduate (named Sukanya) of our program finally came forward to take this on.

The scheme helps her earn commissions from the Government information services under the Right to Information act. She also provides services like payment of electricity bills, Insurance premiums and so on.

Since the utilization of such services is low, the commissions do not provide enough income. Sukanya has means to supplement her income by teaching some of the skills she had learnt to the children in the local community. While many other Kiosk-operators closed down due to insufficient funds and training, Sukanya has found a novel way to leverage the government infrastructure for the benefit of the local community as well as earn a livelihood.

### 5.6 Observations

While the case studies are limited in numbers, we can see that \$5 a day is an easy target in rural grassroots technological startups providing services to the community. We also now believe that infrastructure development is not sustainable and can be a waste without grassroots education with income enhancement and entrepreneurship goals. These examples illustrate the importance of "capacity-building" in any model of inclusive growth that can help eradicate poverty. We started making a dent in about 2007 and have just started to gather momentum. We are optimistic about our integrated model and are looking forward to enhancing economic growth in the Sunderbans.

## 6. What worked

When technology is the hammer, every problem looks like a nail. Technological progress is not the goal; the goal is making life better. We focused on the nail and then built a hammer around it -- a malleable one.

The ethnographic study identified the problem (or the nail) -- *Livelihood*.

Focusing on the problem, it was important to choose appropriate use of technology rather than the technology itself, and we developed a full-cycle approach that led the person to reach from entry to a viable livelihood option.

The project took an inter-disciplinary approach where we worked with development practitioners and the community to arrive at a holistic solution, not just a technological one. The steps we followed were more in line with a Systems development project -- though more on the lines of a traditional SDLC approach.

We kept our costs low by leveraging on the community participation. We made use of underutilized governmental premises, we relied on word-of-mouth advertising and we used low-cost cellular and data communications which were part of the Universal Services Obligation Fund generated infrastructure. Thus we could focus on our core function area and scale up quickly.

Community participation was taken at each step, bringing the needs into focus and involving them in the use of technology. Pilot implementation was done and scaled up after incorporating the learning. Continuous feedback and monitoring and community participation was a key feature.

## 7. The Politics of Technology

United Nations set up the Millennium Development Goals (MDG) to create a world free of poverty by 2015. Goal 8 calls for a global partnership for technological development. Summarizing:

- In cooperation with the developing countries develop decent and productive work for youth.
- In cooperation with private sector, make available the benefits of new technologies especially information and communication technologies (ICTs)<sup>1</sup>.

The second bullet has led most governments in developing countries towards what is now often termed *universal access to technology*. This approach draws on the *individualistic* model of Personal Computer and Internet access use in the developed world; and clones the idea for underdeveloped regions. This a model completely unsuitable for the rural areas where most of the poor live. The result is high cost investments in computer technology for the rural areas with little or no return on investment.

Policy debates have raged where investments by governments in technology infrastructure have been questioned by development practitioners. Often it is said that these investments are futile and a waste of meager resources which needs to be deployed in food, health and education.

This is the philosophy which has led to the concept of the "digital divide", where the rural and the economically weaker sections of society, in the developing nations are not only hampered by their lack of skills and resources, but further marginalized due to their lack of competence in the use of technology.

We were successful in deploying education in conjunction with technology for income enhancement and the ability to leverage (hitherto unused) government developed infrastructure to enhance livelihood opportunities.

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<sup>1</sup> Extracted from United Nations Millennium Declaration at [www.un.org/millenniumgoals](http://www.un.org/millenniumgoals)

## 8. Future Directions

While we have scaled up rapidly on this project over the past four years, to achieve substantial impact of this project it is important for us to be able to use technology and existing available networks, where investments have already been made to the maximum.

The trainer led model of deployment has been effective even in this harsh geography, we now have plans to extend our model and reach larger sections and our plans are to deploy the distance learning and self-learning methodology. We are exploring collaborations with researchers to use the mobile handsets as teaching tools through games and through self-learning techniques, including interactive voice techniques. This can help those who are on a computer to access the lessons on the voice options of the cell and practice on simple standalone desktop computer.

With the recent advent of 3G networks in India there is perhaps a probability of using more of the functionality of the mobile hand sets as a pre-learning device for first time users. We envision skill development leading to the ability to handle work outsources to rural centers from the overcrowded cities.

Also in terms of content, we plan to devise applications like matrimonial services where portals can be developed particularly suited to the rural context where we work. Collecting and uploading relevant content could lead to a whole new set of livelihood options for youth in the region.

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