

CABI Ref.: FR/CABI-PK/DR60007/1113

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ICT Landscape of Pakistan

**Brief status of the industry and possible opportunities for
Agriculture**

December 2008

KNOWLEDGE FOR LIFE



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Executive Summary

Information and Communication Technologies can play a huge role in the development of a country. ICT can play a dramatic role in creating economic and social development acting as a Production Sector for economic growth and as an Enabler for Social Development

The telecom sector has shown remarkable progress in the last few years. The tele-density stands at 58.8% with practically the entire country covered by an operator. The main contributor to this increase in tele-density is the cellular phone service providers with their massive infrastructure rollout and very attractive tariffs and service. The fixed line local loop's share in the market has declined, which is in accordance with the world trends, this is being replaced by the wireless local loop.

The use of Broadband technologies is also on the rise, with the tariff becoming affordable for the home users as well. EDGE base Mobile TV has been launched by three telecom operators, but it remains an expensive proposition for the user. PTCL has recently rolled out 'PTCL Smart' service incorporating telephony, broadband and IPTV at rather affordable rates.

In the distance and e-learning sector, Virtual University started its operation in 2002. It is offering the content of the university courses in delivered on 4 free-to-air satellite televisions and the Internet. Allama Iqbal Open University is the oldest and the largest Open University of South Asia. At the university the traditional method of teaching through correspondence and providing guidance through tutors has been supplemented by quality radio and television programs broadcast on the state media: Radio Pakistan and PTV World

The IT sector has grown rapidly in the last decade or so. In 2007, Gartner released a report titled, 'Analysis of Pakistan as an offshore service Location' and placed Pakistan in the First Category destinations and also acknowledged Pakistan's labour costs to be 30% lower than India's with Telecom costs the lowest of any outsourcing destination. The IT sector is maturing and this is evident from the work that is being done. Innovation in Product development is also taking place, with local companies providing: mobile-based solutions, Apple iPhone/iPod applications, financial solutions to banks and stock exchanges locally and to International customers. Pakistani companies won the award for: 'Best in Media and Entertainment Applications', 'Best in tools and Infrastructure Application' and 'Best in the start-up Category at The Asia Pacific ICT Awards 2008.

Current Significant Agriculture information systems Initiatives in Pakistan include E-Services to Citizens in Food, Agriculture and Livestock Sector, Directorate of Agricultural Information, Punjab, Pakissan (www.pakissan.com) and Agriculture Decision Support System Using Agri Data Warehousing, Data Mining & Web based on line Analytical Processing.

The local funding agencies providing funds for ICT based projects in the development sector include: National ICT R&D fund, Universal Service Fund and the Corporate Social Responsibility Fund (CSR) of Telecom companies. Other sources include specific agriculture related ministries/departments at the Federal and provincial level.

Not many ICT companies as yet are involved in developing ICT based solutions to promote Agriculture at the grassroots level, this is due to the fact that the right combination of experience in Agriculture and ICT is not available in Agriculture sector organizations or in ICT sector organizations.

Hence the way forward is to develop services targeted at grassroots level, explore Agro-Informatics programmes targeted at Agriculture university students. Other opportunities involving IT based project management and IT enabled communication plans of the various Federal and Provincial governments need to be explored



Introduction

Information and communication Technology (ICT) commonly refers to the technologies of Computer, Software, Phones, Internet, Radio, Television, Digital Libraries and Newspapers. The creation, processing and dissemination of Information is believed to be the most significant economic activity of today's global economy. Without ICTs it would be impossible to efficiently and effectively perform this activity.

Pakistan Government though a little late in adopting the ICTs has of late taken significant policy measures to maximize the benefits of the ICTs for the country. In this respect the telecom sector has been de-regularized, the Software Industry is being supported by the introduction of investor friendly policies and also by the creation of relevant support institutions.

In this report, we look at the state of ICTs in Pakistan in order to understand how these can be used in the development sector.

Role of ICTs :

At the outset it is imperative to understand the dramatic role ICT can play in creating economic and social development acting as a Production Sector for economic growth and as an Enabler for Social Development

- **ICT as a Production Sector** which involves role of ICT in the economy strengthening of ICT-related industries such as computer hardware, software, telecommunications and ICT enabled services. In general this involves commercial use of ICT and its contribution to the national economy at large.
- **ICT as an Enabler of Socio-Economic Development** involving the application of ICT strategies which aim to harness wider development objectives. Here the ICTs aid in enhancing the human productivity and create resource efficiency. These also provide easy and timely access to information and hence increase the decision making power of the masses as well as the policy makers.

For the level b) to be of any significance it is important that level a) i.e. infrastructure spread, services and quality and cost of services is in place. However simple provision of ICT as a production sector will not aid the development agenda of a country, it is the provisioning of services on the available technologies that will affect the masses and create powerful social and economic networks by drastically improving the communication and knowledge exchange.



Telecom Sector of Pakistan

In the last few years Pakistan has shown spectacular performance in the improvement of the telecom sector. The sector is growing at an outstanding rate and is playing a key role in the country's economic growth. Currently the telecom sector is the second highest recipient of the foreign direct investment in the country with a sum of US\$ 1.4 billion in 2007-2008. The total tax collection from the sector was PKR 111.7 billion this year.

This has been brought about by deregulating the telecom sector, ensuring an investor friendly environment and by ensuring the sector is regulated effectively. This has assured a level playing field to all operators and also ensured the consumer interests are protected. Pakistan Telecommunication Authority (PTA) is the official regulator of the Telecom sector.

Today the tele-density has increased 58.8% which is reported to be the highest in South Asia. This is a significant achievement as only as far back as 2003 the tele-density stood at a mere 6.25%.

Fixed Line Local Loop service:

Due to the availability and easier roll out of the wireless services the fixed line telephony has shown a decline world wide. The same trend is witnessed in Pakistan. PTCL (Pakistan Telecommunication Limited) is the still the major player in this sector. Though PTA issued licences for FLL to numerous players there are only four major ones in the market and two of these namely Nayatel and WorldCall have made significant investment in laying down fibre optic loop in order to capture niche market services.. The four main service providers are: Nayatel, WorldCall, Brain and Unicom. The service to the Government offices is provided by NTC (National Telecom). The tele-density due FLL is reported to be 2.7%.

Wireless Local Loop

Wireless local loop services started in Pakistan in 2003. This technology is quicker and easier to deploy and easier to maintain compared to hard wired fixed line local loop. It is basically a cellular service using the CDMA technology. However in this case since it is used to replace the fixed line telephony the call rates are the same as that of the fixed line. These are cheaper than the cellular mobile call rates. The basic nature of cellular telephony i.e. mobility is limited for the wireless local loop deployment, so as not to compete with the cellular mobile phone service providers. Since about 70% of Pakistan comprises of rural areas, this technology offers great potential for increasing the tele-density and for provisioning of value added service quickly.). The tele-density due WLL is reported to be 1.4%, but this is expected to increase as the providers get closer to completing the roll out of their infrastructure and offer more value added services.

PTA initially awarded licences to several operators to roll out WLL services, of these 11 were given permission to commence service and currently 9 of these are operational with the other two going into operation in the coming year. The major WLL providers are PTCL, WorldCall, Wateen Telecom, Great Bear and Mytel.

Cellular Phone service

Currently, there are six cellular telecom companies operating in Pakistan i.e. Instaphone, Mobilink, Ufone, Telenor Pakistan, Warid Telecom and China Mobile (brand name ZONG) Pakistan. GPRS services are also launched by these operators in most part of their networks. According to Pakistan Telecommunication Authority (PTA), as a result of progressive network spread by the operators, the facilities are now available to over 90 % population of the country.

The Cellular mobile phones penetration has increased manifold over the last years. According to the PTA website the mobile phone density from a mere 0.22% in the year 2000 has now surged to 54.7% in 2008.



Attractive Tariffs and Services of Cellular service providers:

Currently the cellular mobile phone sector is approaching maturity as all the service providers be they the earliest ones like Mobilink or the latest ones like Zong, all are able to capture a portion of the market share. Market shares of Cellular Mobile Operators indicate that market is moving towards perfect competition. The share of major operators is declining and new entrants are able to capture a bigger share of the market. During the year 2007- 08, Telenor has emerged as the fastest growing operator and has improved its market share from 17% in 2006-07 to above 21% slightly higher than Ufone which also has 21% market share. On the other hand, the leading mobile operator Mobilink is losing its Significant Market Power place rapidly and its share has declined by about 5 percentage points and is at 36% in 2007-08 compare to 41% in 2006-07. CMPak (Zong) is also growing very fast and it has added 2.9 million subscribers in less than a year. A larger number of subscribers have switched to CM PAK, which has continued its aggressive media campaign along with infrastructure rollout.

Therefore, the providers are now focussed on improving the QoS (Quality of service of their offerings), This is also due to the fact that PTA (Pakistan Telecommunication Authority) regularly conducts QoS surveys and the operators whose services fall below the benchmarks are fined accordingly.

In order to distinguish themselves from the other players the operators are constantly offering newer and attractive tariffs to the customer in the form of newer packages. Email and web browsing, sms and voice messaging are available as a standard now. Telenor was the first to launch TV service on its network.

Some of these packages are time based i.e. for the weekend only, choice of a happy hour anytime during the day, cheaper calling rates on the same network. Infact it is rather difficult to keep pace with the newer deals that come out every one –two months. Another way the operators try to distinguish themselves from the others is by offering interesting value added services. These range from really useful ones like the Telenor's 'Teledoctor 1911', 'Telenor Auto Locator' (whereby the phone acts as a personal Navigator), Ask Telenor where the subscriber can ask any question and within fifteen minutes receives the answer via sms, 'TeleKisan' also launched by Telenor is . A service aimed at the agriculture sector called to mundane ones like offered by practically all operators: like songs as ringtones, Mobilink offers the facility of a different ringtone for every caller, Ufone has services like song catcher (play part of a song near the phone and the title line of the song and other related information will be sent to the subscriber), walkie-talkie type service where the subscriber can by push of single button speak to several people at the same time. Though the calling rates remain low it is through these value added services that the providers strive to increase their revenues.

All these services are backed by very aggressive ad campaigns and on the average a new ad is added to the campaign every one to one and a half month. Ufone in this case is far ahead with atleast 2-3 ads showing during the same period.

Broadband Technologies:

The Internet subscription for DSL did not exist in 2000 and was 0.5 Million for the dial up users in the same year. As of March 2008 the dial-up subscribers have grown to 3.7 million and DSL subscribers stand at 130,281.

In Pakistan a wide range of Broad Band technologies like: DSL, Cable, FTTH and WiMax are being offered. At present DSL is the leading technology with 65% market share. The cost of a DSL connection has gone down to PKR 1199/Mo for a 512Kbps unlimited connection making it affordable for home users as well. Major DSL operators are Micronet, LinkDotNet, CyberNet, Multinet and PTCL.



HFC (Hybrid Fibre-Coaxial) is number two broadband technology with a market share of 25%. WorldCall is the largest provider of Cable Modem Broadband through its HFC network in Karachi and Lahore.

PTCL Smart Package:

PTCL Smart package provides 3 services: Broadband, Telephony and IP based Smart TV provides advanced features and services that are not possible with traditional broadcast television systems. These advanced features include Time Shifted Television, Parental Control, Electronic Program Guides (EPG), Global Television Channels, Video on Demand (VoD), Near Video on Demand (NVoD) and many more interactive features. The service is fairly new and is very competitively priced. A 512 Kbps costs PKR 1499/mo (approx USD 20/mo) the customer has to buy a set top box (STB) to use the service. The cost of the STB is PKR 9995/- if bought upfront or the customer can use a 24 month instalment package with a monthly instalment of PKR 500/-. The voice calls are charged at actual rate as per voice package chosen.

Mobile TV

Currently three service providers Ufone, Mobilink and Telenor are providing mobile TV services. This service a GPRS dependent service is available only on on EDGE-enable sets. These sets are rather expensive and out of reach of a common Pakistani. The EDGE tariff is also quite high. Currently the service providers have concentrated on providing a certain number of channels to the subscribers. The tariffs are rather high, but the technology for the service has been deployed. The operators will have to come up with more interesting service packages to attract the customers, an area suggested in this regards is that of video on demand rather than a simple menu of channels.

TV channel industry

Initially the government's Pakistan Television (PTV) had the monopoly in this area as being the only operator. Slowly the sector was opened to other operators as well, however it was only the last few years that the sector was actually opened up and has seen a tremendous growth. At the last count there were over 35 local channels. These fall in the categories of: News, Entertainment, News-cum-Entertainment, Food/Cooking and Music. There is one local English News channel, a Fashion channel and a kids' channel. Most of these channels offer content in Urdu (the national language), there are atleast 2 regional language channels with PTV also airing regional language content via its PTV-National Channel.

In addition to these the Virtual University (VU) is also offering its lectures on its four channels.

Radio

Radio has traditionally been the cheapest way to broadcast information. The last few years have seen a massive introduction of FM channels. The technology is easy to deploy and every major city has more than few channels. This technology can be used to give localized solutions to the farming community. The state radio already broadcasts programmes prepared by the provincial agriculture information/extension departments.



Distance Learning and e-Learning

Virtual University

The Virtual University (VU) started its operations in 2002. It is Pakistan's first University, based completely on modern Information and Communication Technologies. It was established by the Government as a public sector, not-for-profit institution with a mission: to provide extremely affordable world class education to students all over the country. The content of the university courses is delivered on 4 free-to-air satellite televisions and the Internet.

Allama Iqbal Open University,

Allama Iqbal Open University (AIOU) is the first and the largest Open University in Asia. The University with its main campus at Islamabad and huge network of regional centers spread all over the country is serving its students all over Pakistan and in the Middle East. AIOU is a Distance Education institution, which provides multi disciplinary education from basic to doctoral level programs.

The traditional method of teaching through correspondence and providing guidance through tutors has been supplemented by quality radio and television programs broadcast on the state media: Radio Pakistan and PTV World. These programmes are produced by the university itself. The programmes are also sent to the students in the form of audio and video cassettes.. However the one e hour every day on PTV World is not sufficient, for providing meaning full support in the large number of programmes offered by the university.



IT Sector

The Government started its initiative on IT and e-commerce in 2000 when an integrated IT policy focusing on human resource, infrastructure, and software industry development was implemented in August of the same year. Investment incentives like income tax exemption for 15 years on income from export of software, zero custom duty on imports of software and hardware were introduced. Exporters can now retain 35 percent of foreign exchange earnings, and in a move to promote e-commerce the exporters have a permission of opening Internet Merchant Account. Regulations are being legislated for venture capital companies and funds. Pakistan Software Export Board (PSEB) has been established to ensure the developments and implementation of a national policy framework and also to act as a regulatory body.

Since then the industry has grown tremendously. Government of Pakistan is promoting E-Government projects to enhance public participation and make procedures more transparent. Electronic Government Directorate (EGD) was established to ensure the implementation of different projects related to the Electronic Government Programme. It is further mandated to provide technical advice & guidelines for implementation of E-government projects at the Federal, Provincial and District levels, plan and prepare Electronic government projects and to provide standards for software and infrastructure in the field of Electronic Government

Considering language as the main barrier in accessing ICTs, the government is trying to introduce and develop tools like Urdu fonts, proprietary software for Urdu on Windows XP and commercially developed Urdu word processors. Grants have been awarded to develop software commercially in local languages.

The country's IT industry is fairly robust now. The last decade has also seen the return of Pakistani IT professionals from the west, this is partially due to the encouraging policies of the Government. This along with infrastructure development has helped boost the Pakistani IT industry.

In 2007, Gartner released a report titled, 'Analysis of Pakistan as an offshore service Location' and placed Pakistan in the First Category destinations and also acknowledged Pakistan's labour costs to be 30% lower than India's with Telecom costs the lowest of any outsourcing destination

Initially the low cost volume based voice business was an entry point to the export market. The industry has now moved from providing only voice based export services to proper BPO operations. Now, even the local government and private sector has matured and is looking for world class IT solutions thereby creating a local demand for quality IT solutions. The HR required for such operations is fairly developed as well. The only drawback in the Telecom/IT sector is the political instability of the country.

Most of the IT industry is concentrated in the bigger cities. A review of the membership base of the Pakistan Software Export Board (PSEB) of the year 2006 reveals, 38% of the firms are located in Karachi, 28% in Lahore, 33% in Rawalpindi/Islamabad and another 1% is dispersed in other cities of the country. PSEB supported the introduction of standards in the industry by subsidizing the Capability Maturity Model (CMM) certification process. Currently there are two firms certified at CMMI level 5, three at level 3 and another 16 are at level 2. The process is ongoing and another 18 have been selected for the program.

The IT sector is maturing and this is evident from the work that is being done. Innovation in Product development is also taking place, e.g. PixSense offers mobile-based solutions to not only Pakistan but to telecommunication companies like Vodafone Europe and to mobile operators in Philippines,



China and Korea. Recently it also won the award for 'Best in Media and Entertainment Applications' at The Asia Pacific ICT Awards 2008. Another company called Jugaari has developed an application for the Apple iPhone and iPod. In the financial sector Mixit Technologies Order Routing Solution is running at Karachi stock exchange, at the NewYork, Philadelphia and many other American stock exchanges as well as at Dubai stock exchange. Alchmey Technolgoies' Enterprise Risk Manager is being used by around eight Pakistani Banks to meet Basel II regulatory requirements. The switching solutions of TPS are being used by dozens of banks in Pakistan, the Middle East and Bangladesh. Its solution IRIS won the award for 'Best in tools and Infrastructure Application' at The Asia Pacific ICT Awards 2008. Kraysis a company that incubated out of the prestigious Lahore School of Management Sciences (LUMS) offers quality assurance services to the local market. It also won the award of 'Best in the start-up Category at The Asia Pacific ICT Awards 2008. There are companies like CureMD, Adamsoft International and Marriala Consultants providing specific solutions for the health sector. Amaana a company with operations in Lahore, Pakistan and Palo Alto, California has developed payment solution which is essentially a paypal-like model for Pakistan. Amaana gives consumers, merchants, and businesses the ability to send and receive money or airtime via SMS, email, or Web checkout.

In addition to companies growing in size and revenue, number and diversity other elements of Innovation systems have also begun to take shape. There are now industry associations, non-profits and leadership groups of various types; Entrepreneurial Development Programs, Incubation support programs and CEO roundtables. A number of blogs dedicated to industry news and gossip have appeared on the net alongwith a virtual coffee place for the industry.

There has also been a gradual increase in the level and reliability of media/PR firms, Law firms, Accounting firms, HR advisories and investment banks which understand and cater to the requirements of the IT industry. Such infrastructure is a requirement for creating a robust and successful industry.



Current Significant Agriculture information systems Initiatives in Pakistan:

The following section briefs on the significant Agricultural Information Systems/initiatives in Pakistan:

a) E-Services to Citizens in Food, Agriculture and Livestock Sector:

The e-Services to Citizens portal is part of a bigger project 'Automation of the Ministry of Food, Agriculture and Livestock'. The project aims to improve the internal efficiency and effectiveness in the operations of the Ministry and to improve services delivery to citizens. Various portions of this project may be extended to other attached departments of the Federal Ministry and may also be replicated to the Provincial counterpart ministries. The project involves development of several applications for the internal use of the Ministry such as; Internal Office Automation (i.e. Email, Collaboration and Document Management) system, Human Resource Management System, Procurement and Inventory System, Finance, Budgeting and Planning system, Infrastructure improvement & installation of internal networks, Enabling of inter-organizational and public access to information through implementation of work flow applications, Building digitized databases and implementing two-way communication to facilitate e-services delivery to citizens, pilot testing the use of Remote sensing technology as an aid to various agricultural activities e.g. identifying pest infestation, soil vigour and other Pre-harvest, mid-harvest and post harvest conditions and decisions, use of data warehousing technology for aiding analysis and decision making.

The Citizen Services aims delivery to farmers, land cultivators, fruit/vegetable growers, fishermen and other groups involved in Food, Agriculture and Livestock sector in terms of information regarding their profession to help them maintain and expand their businesses so that they can take an active part in the country's economic development through MINFAL portal, automated phone response systems, electronic/print media and other forms of Information dissemination. The information to the portal will come from various other systems (listed above) of the MINFAL.

The portal has been developed. The portal is divided into the following areas:

- Natural Resources
- Agriculture Credit
- Agriculture Trade
- Input Availability
- Agriculture Statistics
- Pest Management
- Yield Management
- Weather Management
- Soil Management

The portal is has not been launched as yet. CABI-SA was granted special access to the portal to preview it. The databases behind the portal still have to be populated; there is hardly any data there to make any meaningful





reports. The User Acceptance Testing (UAT) of the portal still has to be done by the Economic Wing. Currently it seems it will take a while to launch this portal as in addition to the above problems, the interface is not user-friendly. Considering, a lot of people from different backgrounds (Agriculture, Trade, Economics etc) will be using the portal, this is not a good point to start from. Making the interface more user friendly is technically not a huge problem, a little tweaking will make it much easier to use, however it will require significant man-hours given the size of the application.

b) Directorate of Agricultural Information, Punjab

The Punjab has the most comprehensive Agriculture Information system of all the provinces and hence only this is presented here.

The Punjab government has a separate dedicated Directorate for Agriculture information. It charged with improving the capacity of the Research and Extension workers, to disseminate information about modern agricultural technology/cropping techniques through mass media for transfer of technology, to produce educative audio-visual aids for group communication, to work as two way channel of communication between various formations of Agriculture Department of Punjab and To organize training programs on "Agricultural Communication" for professionals of Agriculture and allied departments.

Broadly the Directorate has the following technical sections; Publications section, Audio/Visual Production section equipped with a studio and a high quality recording and editing facilities, Research Information unit with in-house documentation unit, media liaison/audio production unit, computer section and composing/graphic designing unit. It also has a Media Liaison/Research Section.

Print Media

The Directorate produces a fortnightly magazine (Zirat Nama) for the farmers. In addition to this it arranges for the publication of booklets, pamphlets, brochures, handbills etc. It also regularly issues press releases, advertisements and articles on modern technologies in the newspapers round the year. It is also charged with maintaining a Library documentation centre at the provincial headquarters in Punjab for agriculture professionals.

Electronic Media

The directorate regularly supports the production of Agriculture programs on various Radio and TV channels. Agricultural messages, jingles and telops, discussion programs are regularly broadcast/telecast.

Through its Agricultural Video Service the department produces documentaries/films to be presented at various fairs. Farmers can obtain these by providing the directorate with a blank video cassette.

c) Pakissan (www.pakissan.com)

Pakissan is the first Agriculture Portal of its kind in Pakistan providing comprehensive information about the Agriculture Sector of Pakistan both in English and Urdu languages. Information on crops, livestock, orchards, fisheries, horticulture and forestry is available. From Government policies to World Agriculture news; region-wise weather forecast. It also maintains special Report Center and Advisory bringing latest information about crop updates, Canal-wise water status, and controlling pesticides and diseases.

For business promotion and opportunity Pakissan provides latest news on Model farming and corporate farming techniques, marketing techniques and export inquires.

Pakissan hopes to launch online AgriExchange where a number of leads to buy and sell will be available for the farmers and rural stakeholders.



d) Agriculture Decision Support System Using Agri Data Warehousing, Data Mining & Web based on line Analytical Processing

This a project of the National University of Computer and Emerging Sciences funded by the National ICT R&D fund. The project started in June 2006 and is expected to finish in 2009. As the name implies this is a data driven decision support system for Agriculture sector. The project aims to improve the decision making at the policy maker level, at extension level and also at the farmer level.

The project aims to do so by acquiring historical agricultural data in the areas of pest attacks, yield, farmer demographics, social profiles and agro-meteorological data. Then these data sets are to be integrated through data warehousing, data mining and online analytical processing. Development of tools to analyze these data sets along with dissemination of information is also part of the project.



Funding Agencies

In this section the major local funding agencies providing funds for ICT based projects in the development sector are described. Following are some government initiatives with reference to the Development Sector:

a) National ICT R&D fund

The vision of the National ICT R&D fund is to transform Pakistan's economy into knowledge based economy by promoting efficient, sustainable and effective ICT initiatives through synergic development of industrial and academic resources. The government of Pakistan has mandated that a certain percentage of gross revenue generated by all telecom service providers be allocated to the development and research of information and communication technologies with the vision to transform Pakistan's economy into a knowledge based economy by promoting efficient, sustainable and effective ICT initiatives through synergic development of industrial and academic resources. To achieve this vision National ICT R&D Fund has been created. This vision will be realized by pursuing the following goals:

- Cultivate industry-academia partnership by funding concrete development and research initiatives.
- Enhance the national ICT related human resource development capacity manifolds by facilitating industrial demand focused human resource capacity building and R&D capabilities in the country and promoting ICT related educational programs and activities.
- Make Pakistan an attractive destination for service oriented and research and development related outsourced jobs.
- Use ICT as a tool for wealth creation and upward mobility for economically challenged groups of citizens.
- Spread the ICT activities on a true national level.

The fund sponsors projects in the following categories:

- Technical R&D Projects

The fund provides support for the execution of technical projects under this category. So far one Agriculture related project Agriculture Decision Support System Using Agri Data Warehousing, Data Mining & Web based on line Analytical Processing has been funded under this head.

- Human Resource Development Projects

These are divided into two categories:

The Outreach Program:

The Outreach Scholarship Program was launched by National ICT R&D Fund in year 2007. The main objectives of this program are:

- To enhance the quality of human resource for the IT & Telecom industry;
- To create higher education opportunities for the talented youth of the non-metropolitan areas of the country.
- To approach talented students from rural areas, and provide them career opportunities in the IT and telecom disciplines.

The main focus of the Phase-I of this project is to identify and train talented college students from non-metropolitan areas of Punjab, Sindh, NWFP and Balochistan provinces and then train them in the boot camps before their admission to four-year undergraduate programs.

The idea is to give boot-camp training to the youth of the rural areas so that they are able to compete with their urban counterparts in the competitive entrance exams of the IT universities. In the second phase of the project, the students from the boot camps who pass the entrance examination are given fully funded scholarships for the four year degree program.



Industry Apprenticeship Program

Under this program, IT graduates are given on the job training by established IT & Telecom companies. The companies providing these opportunities to the youth are given financial assistance from the National ICT R&D fund.

Scientific Events: Funds are available in this category to facilitate the execution of related/relevant conferences. So far four such events have been funded.

b) Universal Service Fund:

Universal Service fund is created by Pakistan Telecommunication authority. It is funded by the contribution of a maximum of 1.5% of the revenues of licensed Telecom operators net of their dues to PTA, FAB and interconnect out payments.

The idea is to use this pool of funds to support the provision of ICT/Telecom services to the un-served and under served areas of Pakistan.

Following services are included in the un-served/underserved Universal Service Scheme

- Basic payphone telephone services (including incoming calls),
- Broadband Internet service (to support multiple terminals at Telecentres)
- ICT (based on GoP Policy)
- E-mail
- Internet
- E-Govt
- E-Commerce
- E-Health
- E-learning
- Etc.
- Training in computer and Internet use etc.

Corporate Social Responsibility Funds (CSR) of Telecom companies:

These funds are from the private sector. Practically all the telecom operators have established CSR funds. These funds are of various sizes and can be accessed for development related activities. Furthermore as the operators are in a constant competition to gain an edge in the market by providing attractive value added services, these are willing to share profits in case a good service can be rolled out on their network.

Given above it should be possible to design development projects where the capital/pilot expense may be met through the CSR Fund and the operative expenditure may be met via sharing of the profits.

Other sources:

Other sources include specific agriculture related ministries/departments at the Federal and provincial level.



The Way Forward

The IT and Telecom infrastructure in Pakistan is fairly well developed now. There are IT firms specializing in Financial, Medical, Media & Entertainment etc. However not many as yet are involved in developing ICT based solutions to promote Agriculture at the grassroots level, this is due to the fact that the right combination of experience in Agriculture and ICT is not available in Agriculture sector organizations or in ICT sector organizations.

Hence services targeted at grassroots level is one area, another area that needs to be explored is the area of Agro-Informatics. Here programmes targeted at Agriculture university students should be created to develop human resource that understands Agriculture and at the same time is tech savvy as well. Other opportunities involving IT based project management and IT enabled communication plans of the various Federal and Provincial governments need to be explored



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