Current agricultural information system in Tajikistan

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1. Brief description of country

Republic of Tajikistan is located in the south-east of Central Asia, its relief being characterized mostly by mountainous landscape. Mountains cover almost 93% of the country’s territory. In the north of Tajikistan is located the Fergana valley, the north-west and center are occupied by Turkestan, Zerafshan, Gissar and Alay mountain ridges, Pamirs (the highest point being the peak n.a. Ismail Somoni, 7495 m asl.) located in south-east. In the south-west there are Vakhsh, Gissar and other, valleys. The total area is 142 554 km².

The climate of Tajikistan, just like that of any mountainous country, is very diverse: from moderately warm to cold in the highlands. Average annual precipitation in the Republic is 73 mm.

The population of Tajikistan is 7 million - strong. Average population density is 44,9 persons per 1 km². Some 25% of the population of Tajikistan live in the cities, and 72% live in rural areas. Tajikistan is a multi-national country.

2. Brief description of Agriculture

Tajikistan is an agrarian country. The total area of agricultural land in early 90s comprised 4,3 million hectares. Some 82% of arable land (over 660 thousand ha) were irrigated. Plant industry constituted over 65% of the gross agricultural produce of Tajikistan. Cotton growing is the major industry in the country, being a monoculture. Earlier, Tajikistan produced up to 1 million tons of raw cotton. In the recent years cotton production was over 360 thousand tons. Tajik cotton is highly valued in the world. It is characterized by high rupture load and staple length.

Tajik cotton is exported to Latvia, Iran and Russia. Among technical agricultural crops grown are tobacco, sesame, crown flax and crowfoot which is used to produce essential oils. Along with wheat, some other crops are grown, such as potato, fruits, vines, vegetables and gourds and melons. Meat and milk as well as meat and wool livestock is practiced. Foreign investments are used for development of silk industry.

Tajikistan is an industrial-agrarian republic with multi-industry economy. The major types of industry are light, foodstuff, non-ferrous metallurgy, electric power energy, mining and construction materials industries. Fuel and energy industry is based on hydropower, coal, oil and gas.

Tajikistan has rich natural, primarily, hydropower resources (8th place in the world). Potential hydropower resources of Tajikistan are equal to 527 billion kwh. Power of the existing Hydropower plants is 4054 megawatt, and of those being constructed - 4600 megawatt (including Rogun and Sangtoudin plants).

Flora of Tajikistan is represented with 9771 plant species of 20 types. Wild flora of Tajikistan includes around 500 herbal, 90 tanniferous, 115 dye, 60 essential, and 175 decorative plant species.

The total area of the public forest fund is approximately 1,8 mln ha, or 1,3% of the republic’s territory. Dendroflora is represented by 268 tree and bush species.
There are 300 deposits containing over 70 mineral resource types. In accordance with the Constitution of Tajikistan, the basis of the country’s economy is property of various forms. The state guarantees freedom of business and entrepreneurial activity.

3. Brief description of:

A. Current condition of telecommunications in the country

The analogue equipment, both switching, and the transfer systems, used on a network of telecommunications, are physically and morally obsolete. The communication quality very low. The digital switching makes very small percent – only 7.3 % or 22150 lines.

The transfer network in republic, mainly, is constructed on analogue systems. The national network of telecommunications is maintained by the national operator of Open Company «ТаджИСТелеком», created in 1996 as a result of re-structuring of sector of communication.

The initial stage of privatization – 5 % of actions of the enterprises has been thus carried out.

Open Company «ТаджИСТелеком» renders services of the telephone communication and satellite communication. Satellite communication is on the basis of technology DAMA VSAT, and also telematic services. Access to the Internet is through the modem and on the allocated lines. The number of the basic city and rural telephone subscribers in 2003 has made up 232,3 thousand units, from them of 82 % are made by room subscribers.

The international and long-distance conversations in 2002 has made 9757,9 thousand units, 22,7 % are to the CIS countries (against 26,9 % in 2001г.), on other countries – 2,3 % (against 2,1 % in 2001).

With the assistance of companies "Siemens" (Germany), in 1994 on long-distance and international station was established in of Dushanbe.

B. Telecommunications and the agricultural policy

Information-communication technologies are the main driving factor forming a society of the XXI-st century and defining stimulus of development of economy in any country and economic as a whole. Recognizing importance of the accelerated development of sector of telecommunications for economic development of the country, the Republic Tajikistan Government considers sector of telecommunications as one of the most priority sectors of a national economy.

With a view of introduction and use in all spheres of a social and economic and cultural life of a society of modern information-communication technologies, the computer techniques and the telecommunications, fuller satisfaction of growing information requirements of citizens, Republic Tajikistan occurrences in world information community have been published the decree of the President of Republic Tajikistan about strategy acceptance «the STATE

The purpose of the present State ICT strategy is working out of the measures directed on creation of conditions and formation of mechanisms, providing assistance:
· to formation of an information society in Republic Tajikistan;
· to development and updating of various fields of activity (formation, culture, public health services, transport, agriculture, a public life, social protection and others) in Republic Tajikistan
on the basis of wide use ICT;
· realization of the Document of Strategy of Reduction of Poverty, creation of considerable number of workplaces, increase of efficiency of work on the basis of use ICT.

C. Strategy of development of telecommunications in a country

It is necessary to notice, that at present the existing technological base does not allow to provide with a telecommunication service and information of all inhabitants of Tajikistan in particular living in remote regions and countryside. It is connected with a specific geographical position of our republic.

4. Problems and the difficulties connected with use of information systems with application ICT

As a result of civil conflict in Tajikistan, the telecommunication infrastructure has been virtually destroyed. The conflict had also worsened the economy of the country due to a considerable outflow of highly-skilled personnel.

In this connection active development of the market of telecommunications and the newest technologies, such as the Internet, an IP-telephony and mobile, cellular communication of standard GSM, in Tajikistan has started since 1998. The government understands the importance of application ICT in various fields of activity.

5. Requirements for information-communication management

For the decision of the specified problems and improvement of work of telecommunication system in agrarian sector the decision of following problems is necessary:
· Preparation of highly-skilled personnel;
· Technical and program security;
· Creation of uniform information system;
· Access to information system;
· To strengthen potential possibility of existing telecommunications;
· To raise knowledge of the population and дехканских economy to use ИС.
National Status Report
Turkmenistan

1. **Brief description of the country**

**Population** of Turkmenistan exceeds 6.95 millions, of which 46% is urban and 54% is rural population.

Turkmenistan is a multi-national country, hosting representatives of over 40 nations and ethnic groups. Over 90% of population are Turkmen.

Percentage of citizens who did not reach the legal age is 40%, percentage of able-bodied citizens is 55.8%, and that of the retired is 6.1%. Average age is – 24 years. Population density is 11.5 persons per km².

**The country’s territory** occupies the area of 491,2 thousand km² which is the second largest in the CA. Northern and central Turkmenistan are covered by sandy desert of Turan depression – the Central, Zaungouzand South-Eastern Karakoums (nearly 80% of the territory). Nearly 20% of the territory of Turkmenistan is mountains. The distance between the country’s most westward and eastward points is 1100 km, and from north to south it is nearly 650 km.

**Natural resources** of Turkmenistan are rich, diverse, and sufficient for economic development. They include the following most important components:
- industrial resources: oil, gas, hydromineral raw, sodium sulphate, etc.
  Hydrocarbon raw of Turkmenistan is estimated to be 34,5 billion tons of oil equivalent. The State balance of mineral resources includes 127 gas deposits and 27 oil deposits.
- multilateral technical and financial support granted to the private land owners and tenants provided by the government, allowed significant success in the area of agriculture;

**Labour** Of Turkmenistan is highly educated and intelligent:
- Adult literacy rate in the country is 99,8%;
- Priority issues in the area of unemployment policy is facilitating creation of the new workplaces, proceeding with establishment of vocational orientation during training, re-training of unemployed and dismissed employees, increased efficiency and development of labour maret;

The percentage of able-bodied population increases (55%). It provides for increase of labour resources by 4% per annum. This is why the problem of unemployment is given so much attention in the country. In the very first years after proclamation of the independence, the legal basis was created, and the institutions were established to implement the government’s policy in this area. The major documents regulating labour relations and aimed at protecting interests of the employees are: the Constitution of Turkmenistan, Labour Code, The Civil Code of Turkmenistan, the Law «On employment of the population». The major increase of the employment rate is provided through development of private enterprises and joint ventures, individual entrepreneurship and other non-public enterprises and their support by the government. In the last 10 years, the number of employed in the non-governmental sector of the economy increased almost 2 times.

Economic policy of Saparmurat Turkmenbashi, elimination of monopolies in the
country’s economy, structural changes, reforms of agriculture and agroindustry, support to the private producers, secured sustainable socio-economic situation, strengthened the general macroeconomic tendency to improve.

2. **Short description of agricultural system:**
   1. **Plant industry:**
      a. **Cotton production**
         In 2005, the yield of 2.5 million tons of raw cotton was harvested from an area of 621.1 thousand hectares.
      b. **Grain production**
         In 2005, cereal crops were sown in the area of 677.1 thousand hectares, yielding over 2.2 million tons grain.
   2. **Livestock production**
      a. **Cattle**
         The total number of cattle in 2006 constituted 2,089.0 thousand heads, and that of small ruminants мелкого - 11,992.4 thousand heads, producing 393 thousand tons of meat and 1942 thousand tons of milk,
      b. **Poultry**
         In 2006, 762 million eggs were produced
      c. **Bee farming**
         Annually, the specialized bee farms produce 383.3 tons of honey.
      d. **Karakul breeding**
         In 2006, some 333.3 thousand karakul pelts were produced.
   3. **Water industry**
      a. The water resource problem in Turkmenistan is caused mainly by the increasing effects of the human economic activities on the major river basins – Amudarya, Murgaba, Tedgena, Etreka, and on the territories of formation of fresh groundwater streak.
      b. Counting the confirmed underground fresh water deposits, the total of the water resources in Turkmenistan amounts to 26.27 km³/year
      c. In the total of water resources, the share of fresh groundwater is 2%
      d. Total length of irrigation channels in Turkmenistan is 41.2 thousand km, of which in-farm – 33.2 thousand km. Extent of the collector & drainage system is 35.5 thousand km, of which in-farm – 26.5 thousand km.
      e. Amount of water available per-capita per annum in Turkmenistan is 232.0 м³, the lowest in Central Asia.

3. **Short description:**
   a. **Current state of telecommunications in the country**
      During the years after independence, the country has developed a base for development of telecommunications based on the new digital equipment, attracting foreign investments and modern technologies. The priority was given to development of international and inter-city communication.
      To the day in Turkmenistan over 20 digital automated telephone stations were set up, with a capacity of up to 100 thousand telephone numbers.
      Automatic inter-city telephone lines are available in all province and district centers, as well as in the cities.
      Construction of optic-fiber line Transasia-Europe was accomplished, with the length of Turkmenistan segment being over 700 km. The start of its usage has significantly expanded the options to establish international communication channels and to contact the world, and connecting Turkmenistan to the Internet.
allowed the people in Ashgabat, Marhi and Turkmenabat to obtain information on
the condition of the world market.

In the capital, as well as the velayat centers, the subscribers are able to use
digital mobile phone and paging services.

To the date, an optic fiber line Ashgabat-Nebitdag-Turkmenbashi, of the
total length of 638 km, Ashgabat – Dashoguz, 655 km, Turkmenabat-Kerki-
Kerkichi, 230 km, were constructed, along with microwave lines throughout
Turkmeistan (total length - 994 km), digital telephony systems throughout
Turkmenistan (for capacity of some 325 000 numbers), and an “Iridium” satellite
system for 10 subscribers was introduced. International and inter-city telephone
stations and channels were fully digitized.

Turkmenistan has 4 TV channels: «Altyn Asyr», «Miras», «Yashlyk», «TV4»
covering 96% of populated areas. At the same time, «TV4» is broadcasting in
seven languages worldwide, through satellite connection, which allows the other
countries to get acquainted with the news, culture and economy of Turkmenistan.

b. Telecommunications and agricultural policy

Development of information and telecommunication technologies (ICT) is
one of the most important components of the economy of Turkmenistan, and is one
of the major factors of economic growth. Main aspects of the strategy and action
plan in the area of ICT and Internet are reflected in the speech of the President in
the Khalk Maslakhat (National Council).

There are several national programs aimed at development of ICT and
Internet in Turkmenistan:

Economic reforms

Steps and timeframe of the development of agriculture for 1991-2002 were defined
in the programs of the President of Turkmenistan «10 years of stability», «Grain»,
and economic reform in Turkmenistan for the period until 2010».

In the condition of transition period the reformation of land-connected
relations required creation of an appropriate legal basis. It is based on the Land
Code of Turkmenistan, the Laws «On farmers’ households», «On farmers’
corporations», «On rental of land by foreign states», «On transfer of the land to the
ownership of citizens for commodity agricultural production» and a number of
others.

A significant step forward in acceleration of the transformation processes
was ratification of President’s decree «On land ownership and usage right in
Turkmenistan», which lays out the legal norms for the transfer of land into
ownership and long-term usage. This makes rural producer more assured of his
future and facilitates effective land usage.

By 1st January 2006, there were 52,1 thousand farms producing agricultural
output. In one year this number grew by 9,7 thousand.

Total area of arable land attached to farmers’ households comprised 166 720 ha.

Gross agricultural product of farmers’ households as of 31.12.2005, comprised
appr. 10,5% of the total volume.
c. Rural telecommunication development strategy (Internet, mobile phones, radio and TV)

The main strategies for development of the means of communication provide for renovation of the existing and building new networks, opening new international channels, replacing existing telephony systems with digital ones.

In order to develop the existing and create new telecommunication information networks in Turkmenistan, it is planned for the near future:

- Implementation of the national policy in the area of formation and integration of information resources, computerization and fulfillment of citizen’s right for information;
- Integration of information environment of Turkmenistan into the unified global information environment;
- Creation of conditions for development of comprehensive computerization and information industry entrepreneurship;
- Development of information infrastructure and resources;
- Formation of the market of information resources, services, information systems, technologies and the means of its provision;
- Providing conditions for development and protection of all forms of ownership of information resources;
- Attraction of investments, including foreign, to encourage development and implementation computerization projects;
- Development of legal basis for information interaction and formation of the market of information and telecommunication services in the country’s territory;
- Protection of information-related interaction.

d. Current state of services of agricultural extension and rural development information dissemination

Success achieved in the agriculture during the years of independence proves that it’s possible to achieve the goals set forth. The priority task set before agricultural producers remains maximization of production of strategically important commodities, cotton and wheat. In 2005 was harvested 2500 thousand tons of raw cotton and 2600 thousand tons of wheat, while in the 2010 it is planned to harvest 3000 thousand tons of each. This must be ensured by increase of wheat yield to 42.5 quintals/ha and of cotton - to 45 quintals/ha, by 2010, which, in turn, will reduce the land involved in the production process, thus protecting it.

As a reserve for provision of the fresh water for population, the underground fresh waters are viewed. Resolution of the President of Turkmenistan «On the measures to intensify usage of underground fresh waters as water supply sources of the populated areas of Turkmenistan» (1994) provides for intensification of works on designing, constructing and usage of the facilities for supply of fresh underground water to the populated areas. Using these resources could solve the problem of provision of Turkmenistan wit quality drinking water.

Uneven distribution of the confirmed (in use) reserves and the estimated resources of underground water makes more difficult to supply water to population and for other purposes. To solve the problem of water supply of the Balka and Lebap velayats (provinces), in 1995, a resolution of the President of Turkmenistan was ratified, which provides for the future utilization of significant fresh water reserves of the sandy streaks. Currently, these waters are used mainly for outruns. There are investment projects on protection of water resources of Turkmenistan.
being implemented:
- Drip irrigation of perennial plantations on the sloping lands of the foothill plain of Kopetdag (20 thousand ha.), which allows saving irrigation water and increase of the yield of agricultural lands;
- Reuse of lightly mineralized drainage waters in the place of their formation (10 thousand ha), which results in production of additional agricultural products.

Activities aimed at protection of land resources:
- Development of regulations on «The procedure of exclusion of the damaged lands from agricultural rotation for the duration of their rehabilitation» and its approval, which led to effective usage of degraded land, increase of land users’ responsibility and the culture of land cultivation.
- Introduction of the technology on the usage of alternate methods of cultivation of desert lands (area of irrigation of pastures is 14460 thousand ha) – minimization of the deflation and erosion processes. Increase of anti-erosion capacities of the soil.

It is important to note that it is only possible to achieve significant results in the agriculture, if the advanced technologies are widely adopted – that is why the problem of exchange and dissemination of information on the new methods and technologies in rural areas is becoming of priority. Nowadays, a rural farmer can obtain information only from representatives of the local government, and they can receive it from their superior organizations, etc. Yet, though Internet and communication technologies in Turkmenistan are developing rapidly, currently, there are no internet portals or libraries or forums to facilitate information exchange between the farmers of different regions.

Academic institutions:

Turkmen state agricultural university named after S.A. Niyazov

e. Using information and communication technologies for agriculture and rural development

During the last three years the Government has achieved significant progress in promotion of «ICT for development». Today, the laws on computerization, digital signature and electronic document flow and electronic commerce are being drafted. Nevertheless, along with positive achievements, these is a number of problems. So, there are still no truly “online” public services for the citizens or enterprises. Level of equipment of the regional departments of public bodies, basic schools with modern computers and access to Internet is still insufficient. The cost of Internet access remains high, compared to the average income of the population. There is no Internet access in rural areas.

i. Scientific and technical information
Agricultural scientists of Turkmenistan are finding the necessary scientific and technical information in the printed scientific literature. There is no limit on the electronic access to Internet or offline sources like CD-ROM or diskettes.

ii. Research data management
Management of the research data.
In Turkmenistan, the research process is continuous and fruitful. Every country’s research institutions not only possess valuable data, but also
need other information, the results of the research undertaken in other institutions, by other scientists. In this situation, an active exchange of information becomes a necessity.

iii. **Extension of agricultural experience**
While the results of the work undertaken in the area of improvement of agricultural technologies, breeding of new varieties and introduction of new methods of crop cultivation, the role of ICT in extension of this knowledge becomes obvious.

iv. **Agricultural market information**
As necessary legislation on electronic commerce was approved in Turkmenistan, development of electronic market received a necessary impulse.

v. **Organization and management of agricultural research for development. Finance and HR management**
Using of ICT to manage and organize research for development of agriculture.
Usage of ICT in the government offices, research institutions and organizations, and especially usage of personal computers, becomes a necessity. However, at most, stand-alone computers are used to process text, graphics, presentations, even when LAN exist in the organization.

vi. **Communication**
The most popular methods of communication between organizations today are email and fax. Almost all reports, data and documents are transferred from the sub-regional to the regional level as documents attached to emails, scanned copies of signed documents, or as fax messages. Almost all organizations use Internet for communication of data. At most, email accounts are obtained from free online email services such as “mail.ru” and “online.tm”.

4. **Issues and problem of ICT usage, relevant to:**

   a. **Policy and strategy of ICT usage**
The government of Turkmenistan is paying sufficient attention to development of ICT in the country. Favorable conditions for ICT development were created, with the help of international organizations such as UNDP, to introduce ICT into governmental structures.
Unfortunately, up to the moment there was no instructions or proposals on implementation of ICT in agricultural development.

   b. **Capacity building :**
   
   i. **Hardware and software**
   Currently, PC is not widely used in rural areas; in farming enterprises computers are used mostly for composing reports or other documents, and to produce their printouts.

   ii. **Skills.**
   There is lack of qualified ICT specialists throughout the entire country, especially in the area of agriculture. The issue of computer literacy is of very serious concern not only in rural areas, but also in the centers of districts and provinces.

   iii. **Communications (access to Internet, telephone lines, etc)**
   Although telecommunication industry is developing in Turkmenistan at a fast pace and almost all main telephone channels are being equipped
with optic fiber cables, up to moment only 58% of the district centers got renovated. Telephone stations in rural areas are outdated.

c. **Administration and management systems**

Using ICT for management is yet at the stage of research and introduction.

5. **Requirements in the area of information and communication management**

Considering that today ICM is at the stage of development, it is necessary to consolidate the efforts of international organizations and the government to develop and introduce ICM usage policy in the area of agriculture. It is also necessary to implement capacity building projects to improve computer literacy aimed at using the ICT for information and communication management and active involvement of scientists and research institutions in development of manuals necessary for this.
1. Brief Description of Country (300 words/2ppt)

The population of the Republic of Uzbekistan totals to over 25,1 million (as of early 2002), including 37% urban and 63% rural population.

Uzbekistan is a multietnic republic, with over 100 nationalities and ethnicities living in it. 80% of the population comprises Uzbeks.

Uzbekistan has a relatively young population, with a big share of people able to work. The share of under age youth in the overall population is 39%, while 54% are in the working age, and 7% elderly people.

The area of the country comprises 448,9 thousand sq km, which equals to 0,3% of total area of dry land (55th largest country in the world). Over 2/3 of the country’s area consist of plain lands (the Turan lowland, Ferghana Valley, plateaus of Amudarya, Syrdarya, Zarafshan rivers and their branches) and 1/3 comprises mountains and submountains (Tian-Shan and Hissar-Alai spurs).

Natural resources of Uzbekistan are abundant and diverse, and provide favourable conditions for economic development. The main factors of this development include:

- In industry – large deposits of minerals (over 2700 fields of aprox. 100 types of minerals);
- In agriculture – large areas of fertile lands, pastures, abundant sunlight and heat, considerable water resources;
- In tourism and recreation – beautiful landscapes, favourable climate, medicinal springs.

Labour resources of Uzbekistan have a high level of education and intellectual development:
- the literacy rate of the adult population is 99,1%;
- 1/4 of people employed in industry have either higher or secondary vocational education;
- Research activities of the country’s scientists in mathematics, biology, physics and a number of other disciplines are known worldwide.

The Republic of Uzbekistan is a country important for the world economy, and, among the world’s over 200 countries and territories, occupies fairly important positions with regard to natural resources and industrial potential. In particular, Uzbekistan occupies the second place in Karakul production, fifth in cotton, and sixth silk production;

2. Brief description of Agriculture of Country
Agricultural sectors:

1. Crop farming
   a. Cotton cropping
      In 2005, Uzbekistan produced over 3,7 million tons of cotton on the area of 1,473.8 thousand hectares.
   b. Grain cropping
      In 2005, the country’s farms harvested over 6 million tons of grains on the area of 1,322.5 thousand ha.
2. Livestock farming
   a. Cattle
      The total cattle population in all farms of the country in 2006 comprised 6,534.9 thousand heads, small cattle – 11,248.4 thousand heads; 1,060.4 thousand tons of meat and 4,554.7 thousand tons of milk produced,
   b. Poultry,
      1,966.4 million eggs produced in 2006
   c. Beekeeping
      54 specialized beekeeping farms produce 300 tons of honey each year.
   d. Karakul production
      This sector comprises 102 specialized and 6 fattening farms, 2 production and 12 private enterprises, which are part of the “Uzbek Karakuli” holding. 675,2 thousand Karakul pelts were produced in 2006.

3. Water industry
   a. 97% of agricultural production takes place on irrigated lands;
   b. The country has been using over 50% of Amudarya and Syrdarya basins during the past year;
   c. Of all available water resources, 92% are used in agriculture, where 2,3 ha or 53% of cultivated area are irrigated using pumping facilities;
   d. The country has 54 water reservoirs, of which 18 are considered large. The amount of water available in these reservoirs is 17,8 billion cubic meters, including 14,6 billion cubic meters of conservation zone. The country’s water industry comprises 32,700 water facilities, of which over 50 are large-scale; 203.1 thousand km of irrigation systems, of which 37 thousand are concrete chutes; 138.8 thousand km of collection drainage lines; over 1,500 pumping stations.

4. Forestry
   a. As of 1.01.06, forest resources of the Department of Forestry comprised 8,051.3 thousand ha, of which 2,369.1 actually covered with forests.
   b. The development of forestry in the country is the responsibility of 93 forestry enterprises that include 67 forest farms, 8 specialized forestry units, 6 reserves, 3 hunting-preserves, 1 national park.

3. Brief Description of
   a. Current Status of Telecommunications in the Country
      The country currently has a digital communication network covering all main cities and 72,5% of districts areas.

      As of 01.01.2005, total length of fiber optic communication lines and digital networks comprised 6,990 km. All long-distance and international telephone lines have been digitalized.

      Automatic long-distance and international telephone communication is available in all regional centres and 187 districts and towns (96,4%).

      On local telephone networks, 2,066 automatic telephone stations are operating, with total capacity of 1.974 million subscribers, used to 87,5% of full capacity. The share of digital telephone stations reached 46%.

      28% of the total inhabited rural areas are not covered with telecommunication network.

      On local telephone networks of general use, access through analogue lines still prevails. The existing level of subscriber distribution network in certain areas hampers users’ access to data transfer networks.

      The estimated number of Internet users in Uzbekistan in the first nine months of 2006
reached 1.4 million users, or 52.7 per thousand persons. The overall speed of access to international data transfer lines reached 226 Mb/s. The number of mobile subscribers in the same period grew by 79.8% and reached 2,680,500 as of 1st October. The number of fixed telephone devices comprised 1760, and the level of digitalization throughout the country 70.7%. The aggregate profit of communication and information sector for the accounting period made 415 billion UZS, up 48.3% against the previous year. The volume of the services rendered to the population has grown by 58.5%. It should be noted that that in the first half of 2006, the number of Internet users in Uzbekistan made 1.4 million persons, while the number of mobile subscribers reached 1.75 million.

b. Telecommunication and Agricultural Policies

The development of information and communication technologies becomes one of the major components of Uzbekistan’s economy, and is one of major factors of its economic growth. The basic aspects of strategy and the plan of action in the area of ICT and the Internet are addressed in the speech of the President of the Republic Uzbekistan in the parliamentary session in May 2001.

As of May 2003, several national programs have been developed aimed at the development of ICT and the Internet in Uzbekistan:

The national programme for reconstruction and development of the telecommunications network of Uzbekistan for the period till 2010 (Decree of the Cabinet of Ministers №307 of 1 Aug 1995)

The purpose of the Program is creation of a national network of telecommunications on the basis of digital data transfer systems and digital commutation equipment, providing for deep integration into the international system of telecommunications and overall satisfaction of the country’s population and economy with communication services.

The programme for modernization of and improvement of the national data transfer network of Uzbekistan for the period from 1999 to 2003 (Decree of the Cabinet of Ministers № 193 of 22 April 1999)

The purpose of the programme is to identify the main organizational and technical measures on modernization and improvement of the data transfer network for the period 1999-2003 in order to ensure expansion of the network in the cities of Tashkent, Nukus and regional centres in 1999-2001 and in districts in 2000-2003.

The programme for the development of computerization and ICT for the period 2002 -2010 (Decree of the Cabinet of Ministers №200 of 06 June 2002)

The main purpose of the programme is to respond to information needs of the community and to increase the competitiveness of the national economy in the international market.

Further improvement of the legal and regulatory framework, standardization and certification.

Economic reforms

During the independence period, institutional bases of agricultural development have been created.

In particular, the following regulatory documents were adopted: the Land Code, laws “On Agricultural Cooperatives”, “On Farming Entities”, “On Peasants’ Associations”, “On the Reorganization of Agricultural Enterprises”. In the sector, out of many economic models based on non-state property ownership and market relations, three have been selected as most appropriate: agricultural cooperatives
(shirkats), farming associations and peasants’ associations. Organizational and legal frameworks have been created for their development.

As of 1 January 2006, there were 125.7 thousand farms operating in the country. Their number increased by 21.7 thousand during the past year.

The total area of land used by farms comprises 3,775.3 thousand ha.

The share of private farms’ output in overall agricultural production made 24.5% as of 01.01.2006.

The longer-term strategy of agricultural development for 2010 provides for industrial development with intensification of investment processes and gradual reduction of state regulation of the economy in the process of its reformation.

Improve of corporate management in the sector through effective private investment is another long-term goal.

Priority tasks of agricultural development include the following:

- Structural economic reforms in the sector;
- Fostering the production of competitive products;
- Expansion of international economic activities;
- Attraction of foreign investments to organize production of environment friendly and quality products;
- Implementation of modern techniques, technologies and best practices;
- Development of marketing services for enterprises and organizations;
- Organization of exports;
- Creation of new jobs;
- Modernization of available facilities;
- Development of small business and entrepreneurship;
- Localization of production;

**c. Telecommunications Development Strategy for rural areas related to Internet, Cellular Telephone, Radio and TV**

ICT development is a process that requires large capital investments, which is quite a challenge for the country at this stage. Therefore, the development of ICT is primarily carried out using private sector resources obtained from ICT services. The government fosters ICT development through the creation of favourable investment, tax and customs climates, as well as raising public awareness of ICT.

These goals will require:

1. Improvement of the regulatory framework in the area of ICT development and use.

2. Improvement of economic incentives system and other forms of support to ICT development.

3. Development of practical measures for implementation of the following target programs:
   - Introduction of electronic technologies in state administration during the
period 2003-2010;
- Development of e-commerce during the period 2003-2010;
- ICT development for the period till 2010;
- Training and retraining of ICT specialists and teachers.

4. Development and implementation of sectoral programs (health, taxation, pensions, social welfare, etc) in the area of ICT.

A very important factor for the successful implementation of reforms are the measures aimed at restructuring of state-owned ICT companies. Currently, 11 joint ventures are operating in the field, whose share of services already comprise 35.7% of industry’s total. Joint-stock companies account for 53.4% of the sector’s services.

As a result implemented measures in the form of investments and credits, over 300 million US dollars have been invested and disbursed for the creation of local, long-distance and international digital phone lines only.

Much work has been completed in terms of broadening cooperation with foreign countries and international companies. For instance, a modern satellite communication station was built in Tashkent in 1992 together with Japanese partners. Simultaneously, another satellite station was launched in cooperation with Turkish colleagues. These new stations provided direct independent access to international networks.

One of the main areas of ICT companies’ activities is implementation of new technologies and services. These include: IP-telephony, new data transmission systems, mobile standards and technologies, wireless access, introduction of VSAT, automated management systems, introduction of new services in telephone stations, satellite communication etc.

d. Current status of Agricultural Extension and Rural Development Information Services

For today, the Uzbek government has concentrated all its attention on two main strategic agricultural products: cotton and wheat. Many research institutes and testing facilities by and large work with a view of developing these areas. And many new technologies, new varieties of cotton and wheat, new methods of irrigation and fertilization are implemented in these fields.

Due to the fact that Uzbekistan uses locally available waters on only 20% of irrigated fields, and 80% are received from neighbouring Kyrgyzstan and Tajikistan, effective utilization of water resources is critical for the country. In cooperation with international institutions, the country is implementing projects on research and implementation of effective water utilization and management in agriculture. Improving soil fertility is also a key factor, because cultivated areas are going down each year due to growth of population and allocation of lands for residential construction. The required level of agricultural output can only be achieved through increasing crop productivity.

At present, many technologies and methodologies improving the above-mentioned factors are under development, while some of them have been successfully completed and recommendations on introduction of new technologies submitted to respective ministries and agencies.

It is important to note that visible results in agriculture can only be achieved provided new technologies are widely introduced. This makes the issue of dissemination and exchange information on new technologies very important at this stage. Currently, a farmer or peasant in a rural area can only obtain information from local administration bodies, which in turn receive it from their parent bodies, and so on. Internet and ICT, although rapidly
developing in the country, are not accessible in farming. Even if ICT spreads into rural areas in the near future, farmers and peasants will not be able to take advantage of it due to lack of knowledge and skills.

e. ICT use in agricultural and rural development

During the last three years, the Government has achieved significant progress in promotion of “ICT for development”. Laws have been drafted in the areas of information, digital signature, electronic document circulation and electronic commerce, and adopted by the Parliament, which provided the basis for a wider application of ICT. This has supported the Government in its adherence to ICT development. In confirmation of its adherence to ICT, the Cabinet of Ministers has instructed all government agencies to launch active a web-sites by the end of 2002, and now practically at all major ministries, committees, agencies and regional administrations have web-sites.

Nevertheless, alongside with positive achievements, there is still a number of problems. So, there are still no real-time "on-line” state services available to citizens and enterprises. For example, majority of state web-sites are not updated on a regular basis, and do not contain relevant information. The level equipment availability and access to the Internet at regional branches of state bodies and public schools remain insufficient. Cost of access to the Internet remains high compared to average incomes of the population, which results in low availability of the Internet to wider population. This problem is particularly apparent in rural areas where the high cost of access is aggravated also with insufficient development of an infrastructure and low awareness of the population about ICT.

In the ICT-related policy there is no direct interrelation with Uzbekistan’s specific goals on poverty reduction, education, public health etc. Strategic documents, including the National Program on Personnel Training, the National Program on the Reform of Public Health, the National Program on Protection of Environment, the Program on the Development of Exports etc that are aimed at achieving these goals, do not provide for implementation of ICT as a powerful tool fostering their achievement. As a result, advantages ICT offers in the creation of jobs, income generation, more efficient control and in a number of other areas are not used in an integrated manner.

f. ICT use in agricultural research and development for:

i. Scientific and technical information

Agricultural scientists of Uzbekistan usually find the necessary scientific and technical information in print scientific materials, and mostly in expensive sources from developed countries. Electronic access through the Internet or independent media, such as CD-ROM or diskettes is also limited by poor infrastructure, for example, lack of or expensive access to the Internet, lack of appropriate electronic literature in local languages or Russian, lack of or outdated equipment.

ii. Research Data Management

Management of research data.
In Uzbekistan, research activities are conducted on a regular basis, and very good results are achieved. Each country, research institutes not only own valuable data as a result of these activities, but also require other information from other scientific research institutes and scientists.
In this situation, active information interchange becomes a necessity. Unfortunately, there are differences both in the structure of data, and in ICT implementation patterns (various forms of reporting, different software, different levels of access to the Internet) in different institutes, which complicates direct research data exchange. Harmonization of standards for data collection both within and between countries, as well as their private sectors is today’s requirement.

iii. **Research Management**

Uzbekistan is currently at the stage of developing online communities comprising research institutions, international organizations, NGOs and other interested parties. Much information on research activities, scientific developments and projects is available on the Uzbek segment of the Internet, from such portals as Development Assistance Database of Uzbekistan ([www.dad.uz](http://www.dad.uz)), Central Asian Gateway ([www.cagateway.uz](http://www.cagateway.uz)), Uzbekistan Development Gateway ([www.gateway.uz](http://www.gateway.uz)). It should be noted that these sources provide information on various projects in agricultural development, but unfortunately no scientific information.

It is important to note that CACAARI ([http://cacaari-forum.narod.ru](http://cacaari-forum.narod.ru)) is particularly involved in this issue and the creation of an online community of research institutions, and has big experience, knowledge and know-how, and this may serve as a starting point in promotion of the Internet in agriculture.

iv. **Agricultural Extension and Outreach**

Although much work is carried out on improvement of agricultural technologies, new varieties are developed, new methods of crop cultivation introduced, the role of ICT in this area is insignificant. ICT is by and large used for gathering statistics, for document circulation and office work, while the use of ICT in scientific research, data dissemination and exchange is very limited.

v. **Agricultural Market related information**

Электронный рынок Узбекистана на сегодняшний день начала развиваться сильными темпами — принятые необходимые законы о электронной коммерции дало толчок на развитие в этой отрасли. На ряду многих бирж, где происходят электронные торги, агропромышленная биржа тоже представлена в интернете и предоставляет своим посетителям определенную информацию. The electronic market of Uzbekistan is rapidly growing, with the adoption of necessary laws on electronic commerce that have driven the development in this area. Among a number of many stock exchanges represented on the Internet that trade electronically is the agricultural stock exchange, which offers its visitors certain amount of information.

[http://www.agrobirja.uz/bizness/uzb/uzb.htm](http://www.agrobirja.uz/bizness/uzb/uzb.htm)

It should of course be noted that today’s state is only the beginning of development, and much has yet to be done.

vi. **Agricultural Education**

The government is strongly interested in skilled personnel. Within the national education program of formation, many new agricultural colleges have been built and the existing ones modernized. All colleges are equipped with computers, with certain level of Internet access. In almost every region there are business incubators operating, which train interested persons in new business methodologies.

vii. **ARD Organization and Management such as Financial and Personnel Management**

The use ICT at state administration offices, research institutes and organizations, and especially the use of personal computers is
becoming common practice. Some organizations have already completed computerization of their personnel and finance administrations. Still, computers are mostly used on an individual basis for text processing, tables, presentations, even though there is LAN in these organizations.

Of course, it is too premature to speak about joint use of financial and personnel data between various structures, but inside one organization at the regional and sub-regional level such approach is necessary. For now, the bottom-up flow of data and reporting goes in the form of quarterly and annual reports where all data are processed at the sub-regional level, and then in the form of reports submitted to higher authorities.

The government, in partnership with UNDP, is currently implementing an “Electronic Government” project aimed at computerization of management of organizations and document circulation, centralization of financial and personnel data management. This project is currently at the stage of development, and is being piloted Syrdarya region. Based on the results of this project, new attitudes and a policy in the field of ICM will be introduced.

viii. Messaging and communication
E-mail and fax are currently predominant in communication between different organizations. Almost all reports, data, documents are transferred from district level to regional and vice versa in the form of documents attached to emails, or in the form of scanned documents or fax if they have a stamp or signatures. For this transfer, almost all organizations use services of Internet Service Providers, they have currently no own communication and document circulation systems. Even so, almost all organizations using the Internet use dial-up connection for separate computers, and have no high-speed corporate connections that would allow for all computers to be connected. They mainly use free Internet-based email services, such as @mail.ru, @list.ru or those provided by their ISPs, such as @uzpak.uz, @rol.ru. Of course, in this situation information security cannot be talked about.

ix. Publicity and mass communication
For today, all publications in the agricultural sector are issued in print form: articles in district, regional or republican newspapers and magazines, scientific works in the form of brochures, collections of theses. Many agricultural scientists use the Internet mainly as a source of information, but do not actively publish their works on the Internet.

4. Issues and Problems in Using ICT enabled information systems related to:
   a. Policies and strategies for ICT use
   The government of Uzbekistan is currently putting strong emphasis on ICT development in the country: as we said earlier, necessary measures are taken and conditions created for ICT development, there are joint activities with UNDP on introduction of ICT in state administration and educational institutions. Necessary resolutions have been issued for the development of e-commerce, both private and exchange-based. Unfortunately, there are still no guidelines as to how to introduce and use ICT in agriculture: all sectors have their own way of development, and there are no common development strategies. All required legislation on the
development of farms and peasants’ associations have been adopted, but they don’t provide for ICT development in the sector. At the current stage of ICT development, such areas as health, taxation, pensions and social protection have been identified as priorities.

b. **Capacity development:**

i. **Hardware and Software**

The current situation with the use of PCs in rural areas is less than perfect, not all farms and other agricultural enterprises have PCs available, and even those available are obsolete. Available PCs are mainly used for text processing, printing and reporting. Purchase of new PCs by individuals in rural areas is rare due to low purchasing power. Almost all software used on these PCs is of pirate origin, with a small share of freeware.

ii. **Skills**

The whole country is experiencing lack of skilled ICT specialists, especially in agriculture. Of utmost importance is the issue of computer literacy in rural, as well as urban areas. Many rural people don’t even know what is Internet and how it can help in their work.

iii. **Connectivity (Internet access, Telephones access etc.)**

Despite the rapid development of ICT in Uzbekistan and widespread replacement of old telephone lines with fiber optics, only 70% of district centres have currently been re-equipped. The government is planning to complete this process by the end of 2010. but currently many rural areas have old analogue telephone stations hardly capable of voice communication, let alone connection to the Internet. Not all ISPs install their equipment in rural areas, so access to the Internet for rural population still remains a luxury and requires going to district centres or cities.

c. **Systems management and Administration**

As we said before, the use of ICT in management is yet at the stage of research and implementation. Even these initial activities are taking place in one regions, while in other regions there is no progress. The reason for this is lack of a single policy in this area, concrete instructions, training materials and software. Introduction of electronic management requires significant investment. Many organizations currently have no financial and human resources for this.

5. **Needs for Information and Communication Management**

Because ICM is currently at the stage of development, it requires consolidation of the government’s and international organization’s efforts in the development and implementation of a strategy for introduction of ICM in agriculture. It is also necessary to actively implement educational projects in order to raise the level of computer literacy required for use of ICT for information and communication management, creation of virtual networks and national content (information portals, electronic libraries) and active involvement of research institutions and scientists in these activities. It is very important to develop a single ICM standard for agriculture, and create favourable conditions for further ICM development and creation of virtual data exchange networks between various organizations, because once this exchange becomes fragmented and uncoordinated, it will be very difficult to standardize the information.