Azerbaijan Human Development report 2003

Foreword

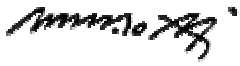
The greatest measure of any society is reflected in the opportunities that it creates for human personal development and the expansion of choices in relation to knowledge-based development and humanitarian progress. These principles are fundamental to the concept of human development, which were introduced by the United Nations Development Programme (UNDP) on a global scale in the 1990s. Since then, these goals are being integrated by governments throughout the world in order to expand human choices and to struggle against human deprivations and disparities. Azerbaijan is no exception in its quest to achieve these principles as well.

The human development process, which the UNDP has been monitoring in the Azerbaijan Republic since early 1994, shows steady growth in the Human Development Indices (HDI) after measures taken in 1993 and 1994 in the economic and social sphere. This is particularly true, starting with 1996, after the devastating years immediately following the collapse of the Soviet Union (1991) when Azerbaijan first gained its independence. At that time, the Azerbaijani government, in close cooperation with international organizations deliberately and systematically began to implement measures aimed at human development.

This analysis - The Azerbaijan Human Development Report 2003 - highlights some of the most recent achievements in human development, including the mobilization of the Information Communication Technologies (ICT) and other modern technologies, and the creation and introduction of a Human Development course into the curriculum of secondary schools. This is the first time in the history of Azerbaijan that such a course has been taught in the public school system. These concepts are supplemented and strengthened by a textbook, which was specifically written to be culturally relevant and specific to Azerbaijan. Another major achievement in Azerbaijan has been the establishment of the Human Development Center, as an integral department of one of the major international oil companies. The Center's primary focus is to convert "black gold" into "human gold" for the benefit of the entire nation.

It is very timely that the Government has recently transformed the Ministry of Communication into the new Ministry of Communication and Information Technology. Apart from recognizing the linkage between communication and information technology, this decision has the potential to strengthen Government capacity and contribute to reform in the ICT sector.

This Report explores the potential use of ICT and other modern technologies to facilitate the human development process. The UNDP has established a global priority for what they call Millennium Development Goals, which have also been endorsed by Azerbaijan. These goals are aimed at eliminating human deprivations and disparities through the transfer of knowledge and new technologies. Along with the analyses of the existing, as well as potential, use of ICTs, this Report makes specific recommendations for further strengthening of human development.



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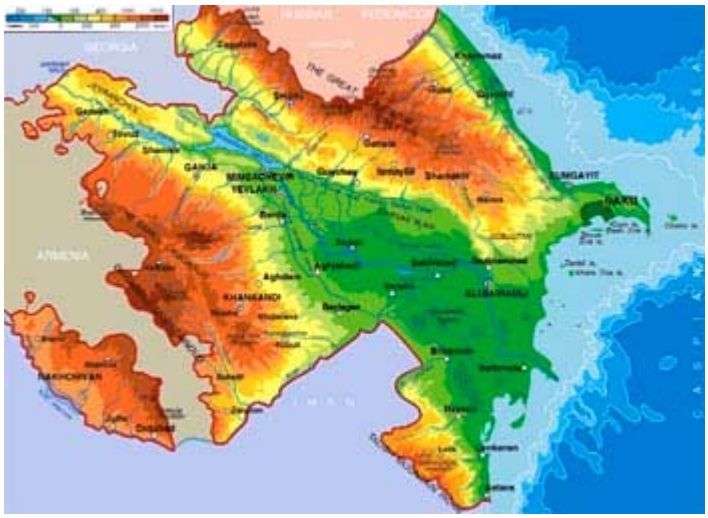
Abbreviations

AIOC	Azerbaijan International Operating Company
ACG	Azeri-Chirag-Gunashli Oil Fields
ASOA	Azerbaijan State Oil Academy
ASRNA	Azerbaijan Scientific Research Network Association
BP	British Petroleum
BTC	Baku-Tbilisi-Ceyhan Pipeline Route
CBO	Community Based Organizations
CIS	Commonwealth of Independent States
FIA	Foreign Investments Agency
GDP	Gross Domestic Product
HDI	Human Development Index
IDP	Internally Displaced Person
ILO	International Labor Organization
IMF	International Monetary Fund
ICT	Information Communication Technologies
IT	Information Technologies
ISP	Internet Service Provider
MP	Member of Parliament
NBTR	National Board for Television and Radio
NGO	Non-Government Organization
NICTS	National Information and Communication Technologies Strategy for the Development of the Azerbaijan Republic for 2003-2012
OECD	Organization for Economic Cooperation and Development
OSI-Azerbaijan	Open Society Institute in Azerbaijan
PPP	Purchasing Power Parity
PSA	Production Sharing Agreement (international oil contracts)
PSTN	Public Switched Telephone Network
RCC	Regional Commonwealth of Communication
SMS	Short Message Service
SCS	State Committee of Statistic
SCSA	State Commission for Students Admission
SDW	Solid Domestic Waste
SOCAR	State Oil Company of the Azerbaijan Republic
SOFAR	State Oil Fund of the Azerbaijan Republic
SPPRED	State Program for Poverty Reduction and Economic Development
TAE	Project of TransAsiaEurope
TAI	Technological Achievements Index
TCCM	Trans-Caspian Cybernetic Market
TRACECA	Transport Corridor Europe-Caucasus-Asia
UIAZ	Union of Inventors of Azerbaijan
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization

Basic Information about Azerbaijan



Azerbaijan Republic (Geographical Data)
Location: Between 44° and 52° east longitude, 38° and 42° north latitude.
Territory: 86,600 square km, 11.5 percent covered by forests, 1.6 percent covered by internal waters. Fifty percent of the territory is agricultural lands, 27 percent of which are pastures.
Borders: Russian Federation (390 km, Georgia (480 km) and Armenia (1, 007 km), Turkey (13 km) and Iran (756 km).
Capital city: Baku (located in the eastern part of the country, on the Caspian Sea).
The Caspian Sea is the largest lake in the world, 400,000 square km, with a maximum depth of 1,025 meters.The length of the widest area of the Azerbaijan section of the Caspian Sea is 456 km.
Length of Coastline: 713 km.
Highest peak: Bazarduzu at 4,466 meters.

Form of Governance	Presidential Republic
Head of State	Ilham Aliyev
Area	86,600 square kilometers (About 20 percent under occupation)
Population	8,266,000 (January 1, 2004) 50.8% urban, 49.2% rural. About 13% are refugees and IDPs Population density: 94 per sq km
Currency	Manat (4,860.8 manats: US$ 1, average 2003)
Economic Indicators	Per capita GDP: US $879.7 Annual real GDP growth rate: 12.1% Inflation rate: 2.2%
Life Expectancy at Birth	73.3 years (75.1 for women, 69.5 for men)
Participation of Women in Governance	11 % in Parliament (Milli Majlis) 9% of Ministerial level positions 9% of regional heads of administration 11% of Ambassadors to foreign countries
Language	The official language is Azerbaijani. Other languages: Russian, Georgian, Armenian, Lezghi
Religion	Majority of the population is Muslim Other religions include Orthodox Christianity, Catholicism, Protestantism, Judaism
Employment	11.5% of total employment is in industry and construction 40.1% in agriculture 48.4% in services 32.3% of the total employment is in the State sector

	(compared to 67.5% in 1991 and 46.2% in 1998)

EXECUTIVE SUMMARY

Chapter 1: Human Development and Modern Technologies

The present situation related to human development in the Azerbaijan Republic is discussed in this chapter. The monitoring of the process of human development, which began in Azerbaijan in 1994, shows positive trends of stable growth of the Human Development Index (HDI) and its integral components. This growth began in 1996 after measures were undertaken in the economic and social spheres in 1993 and 1994. Throughout these years of growth, an increase in the HDI was influenced by the annual growth of Gross Domestic Product (GDP), which, on average, increased at the annual rate of approximately 9 percent. The increase in GDP reflects the rise in the Education Index and the Enrollment Index.

The National Strategy for Information Communication Technologies (ICT) development has been implemented, which will facilitate the country's transition to an information society. The assessment of the Technological Achievement Index (TAI) has shown that these indicators, which are important for knowledge-based development and formation of "human gold" has increased by 11 percent since 2002.

This chapter provides policy recommendations which are of crucial importance for the human development process and for achieving the Millennium Development Goals (MDGs). Among these suggestions is the development and fulfillment of a national strategic program for the development of modern technologies from the perspective of an ICT development strategy. Such programs could be developed by both national governmental and non-governmental institutions with the support of international organizations. This chapter also provides recommendations for the acceleration of human development and human gold formation in the country.

Chapter 2: Information Technologies and Human Development: Diffusion and Application of ICT

This chapter is dedicated to the assessment of the modern state and perspectives in the field of ICT for human development and the achievement of MDGs. Since Azerbaijan has gained its independence, processes related to Azerbaijan becoming an Information Society have accelerated. The main prerequisite for Azerbaijan's transition to an Information Society is its human capital. The country has a sufficient number of professionals who can participate in the process of development of information technologies and other highly developed technologies. This will result in the intellectuals being more readily supported by educated citizens, skilled in many fields of science and technology.

The most important achievements that are required to create the infrastructure for an information society include the development of cable dial-up telephone lines, the expansion of satellite link channels, the launch of modern main links, such as fiber optic communication, the rapid development of cellular link communication and the Internet, computerization of working positions at local executive power bodies. Social investment programs of international oil companies have supported the distribution of ICT and other modern technologies throughout the country.

Policy recommendations relate to the development and programming of a state strategy in the field of modern and high technologies implementation, similar to the ICT strategy. It also includes the extension of the National Strategy for Information Communication Technologies (NICTS) until 2012. The acceleration of institutional and structural reforms for further improvement of the business environment, attraction of investments to non-oil sectors, as well as to technological developments should also be made.

Chapter 3: Modern Technologies and Formation of Human Gold

This chapter discusses the situation in regard to ICT use in education, as well as the use of economic and technological opportunities provided by the country's energy sector for the formation of human capital and the provision of the process of steady development of the country. ICT are currently being utilized in the education system. One of the first applications was in the creation of admission exams to determine which students were best qualified to

enroll in secondary schools and higher education. Currently, this work is being carried out by the State Students' Admission Commission (SSAC). Its activities ensure transparency and fairness of the entrance examinations thereby offering equal access to education by organizing exams and assessing students' knowledge.

Oil extraction and refining are traditionally the leading factors in the development of Azerbaijan's economy that have greatly influenced the formation of human gold. Azerbaijan now has the opportunity to distribute its black gold at its own discretion and to use it with respect to its own national interests and in close cooperation with the international community. As a result of the implementation of the National Oil Strategy, numerous oil and gas Production Sharing Agreements (PSAs) with foreign investors have been signed. Foreign capital has been directed into the country for the development of oil projects that, in turn, contributes to current economic growth and the influence on human capacity building process.

Policy recommendations involve the conceptualization of concrete projects, connected with the renewal of natural sources and the accumulation of intellectual potential from significant dependence upon the oil sector. In this regard, ICT could be considered as one of the resources requiring rapid transition from the import of informational technologies to their export. Taken into account the strategic aims of the MDGs and Poverty Reduction Programs, recommendations were made to develop high technological enterprises of machine building and hardware of ICT, food industry, pharmacology, small and medium enterprises. As well, it was suggested that competitions could be held that would lead to the creation of new products for the development of the domestic market of Azerbaijan and for export to the international market. The combination of the modern technologies and traditional knowledge can provide competitiveness for such products and sustainability of economic activity.

Chapter 4: Modern Technologies and the Democracy Processes

This chapter addresses the state and prospects of using ICT and the achievements of ICTs for the further progress of democracy and the expansion of public participation in decision-making, reform implementation and the promotion of the free flow of information.

Despite the hardships of the transition period, Azerbaijan is continuing to move towards democratic and economic reforms. Expansion of ICT is promoting public awareness. This is becoming more and more evident in the number of Websites that are being operated by the mass media and in the growing use of the Internet. The expansion of ICT promotes public participation in decision making and the implementation of reforms. This is promoted by the creation of Websites by Azerbaijan's Ministries and other governmental institutions, and the availability of interactive contacts with both government bodies and the mass media. The promotion of public participation also contributes to the development of Non-Governmental Organizations (NGOs) and Community-Based Organizations (CBOs) and their being equipped with modern ICT. Using modern ICT in the process of education and the selection of students is an important condition for the formation of human capital. Foreign oil companies operating in Azerbaijan have also contributed to this process. The transparency of elections is also fostered by the utilization of new ICT.

Policy recommendations involve the improvement of the National Statistics Indicators System by the State Statistics Committee to ensure the possibility of monitoring the country's readiness for using ICTs and in making international comparisons. It is further suggested that work to actualize information should be provided by Websites of public agencies (Ministries, Committees and other similar bodies). If the Ministry of Communications were to decrease tariffs for Internet access, the Internet would be available for a much broader number of users, especially NGOs.

HUMAN DEVELOPMENT AND MODERN TECHNOLOGIES

Chapter 1

1.1 Introduction

Since 1990, the United Nations Development Programme (UNDP) has implemented measures aimed at human development. The global Millennium Declaration, which Azerbaijan has also endorsed, provides additional incentive to the

development and realization of these ideas. When Azerbaijan became an independent Republic in 1991, this created opportunities for the free and independent development of the country and for its involvement in global initiatives. Monitoring the human development process began in 1994 and was documented by the publication of the first National Human Development Report of Azerbaijan in 1995. In this relatively short period, the focused activities of the government have led to a consistent improvement in the human development indicators. Due to the dramatic decline of the GDP between 1991 and 1995, the indicators were very low; but since 1996 they have been improving along with the economic growth in the country. The country's rating in various aspects of human development has shown steady improvement.

The growth of human development indicators was brought about because State Policy made them priorities, aimed at expanding the economic, social, and political human rights, as well as creating opportunities for realization of the potential of every member of the society. The development of these priorities was based on three subsequently implemented activities, the first of which was the dissemination of information related to the concept of human development throughout the population.

The second activity involves training specialists in human development theory and practice as related to planning and management. Success in raising the population's general awareness of human development, as well as professional training facilitated the third phase of the State Policy. The President issued special decrees to ensure fulfillment of the measures on the provision of sustainable human development and ecologically sustained development. Since 2001 tasks set up by these decrees, as well as relevant programs have been implemented. In 2002, the State Program for Poverty Reduction and Economic Development (SPPRED) was adopted in which the government has worked together with the World Bank and other donors. On February 10, 2003, the National Strategy for Information and Communication Technologies for the development of the Azerbaijan Republic for 2003-2012 (NICTS) was issued by the President.

In the next 10 years, NICTS will become the most important infrastructure component for rehabilitation and further technological, economic and social progress in Azerbaijan. This should contribute to reaching the MDGs. Throughout 2004-2005 the implementation of these goals will be carried out with support from UNDP and other international organizations.

This chapter is dedicated to the role of ICT and higher technologies in the intensification of human development and formation of human potential. The monitoring of human development processes in the country is an important tool for planning and implementing this field of activity. In this regard, this chapter also addresses the dynamics of various human development indicators.

Box 1.1. Human Development - Element of General Secondary Education

Since 2001, a course in Human Development has been offered in the 10th Form (grade) at 25 selected secondary schools in Baku. This was the result of a joint project between UNDP and Azerbaijan's Ministry of Education. Training materials have been developed and seminars have been conducted for teachers of secondary schools to ensure successful implementation of the project. In 2002, the pilot project was expanded, the number of secondary schools increased, and the area of the project has been extended beyond Baku.

On February 25, 2003, the Ministry of Education made a decree introducing Human Development as a faculty course for all schools in the country, based on the success of the pilot project. A training programme, established with the help of UNDP, has been developed and adopted by the Higher Methodical Council of the Ministry, and has been published and distributed among schools throughout the country. The Human Development textbook was published in September 2003 and has been distributed to all secondary schools throughout the country.

1.2. Modern State of Human Development

Azerbaijan's HDI rating has been subject to significant fluctuations during the years of global measurements of human development indices. According to the Global Human Development Report, based on the indicators for 1992 (as reported in UNDP 1995), Azerbaijan ranked 99 among 174 countries in terms of the Human Development Index. According to the UNDP 1998 Global Report, Azerbaijan's ranking then fell to 110. The UNDP Global Reports for the following years were indicative of evolving and strengthening trends of growth of human development indices. In the latest available UNDP Global Human Development Reports (UNDP 2002, 2003), Azerbaijan has already begun to take a higher position 88 and 89 in the list of more than 170 countries. This improvement was primarily due to the increase of GDP per capita brought about by economic growth that began in 1996.

This has also resulted in increased indicators of human development such as life expectancy at birth and education. According to the UNDP-adopted classification, Azerbaijan is in a group of countries with an average HDI of 0.500-0.799, in which countries display the most dynamic changes of positions in terms of rating and competitiveness. However, in terms of per capita

income, Azerbaijan till 2003 was categorized with countries that have a low level of income (US $755 or less per year). Azerbaijan's rank according to these classifications is likely to increase in the years to come as a consequence of the expected economic growth.

According to the assessment in 2003, the economic growth was 12.1 percent compared to 10.6 percent in 2002. As a result of the established tendencies, higher economic growth is expected between 2003-2005 at the rate of about 11 percent per year. The growth of real GDP per capita lags behind the growth of the gross indicator due to the moderate growth of population. Growth in real GDP per capita lags behind the real GDP by about 1 percent.

In 1999, GDP per capita was $574. In 2000, it was $654. In 2001, it rose to $715. According to national statistical data for 2003, GDP per capita is reported at $879.7, and according to the government's forecast it should be no less than 920 for 2004. GDP per capita still remains the major component promoting sustainable growth of the Human Development Index.

Poverty in Azerbaijan remains the primary obstacle for sustainable human development. Its elimination or reduction will influence all other human development indicators and the development of further reforms. Human Development and Ecologically Sustainable Development were established as components of the national strategy by Presidential Decrees in 2001. The Commission on Human Development is coordinated by the Ministry of Economic Development. The National Human Development Strategy will be based on the achievements already made to introduce well planned approaches of human development toward poverty reduction and economic development.

Though the Human Poverty Index (HPI-2, according to UNDP classification) is decreasing, it still remains high. According to calculations based on recent available data on the number of the poor in the country and employment, as well as on data on the percentage of the population who die under 60 years of age and appraisal of functional literacy of the population, the HPI-2 in Azerbaijan decreased by 32 percent (2002). According to previous data, based on the appraisal of poverty in the country by the World Bank, HPI-2 was 43.4 percent. This decrease of poverty index is related to the fact that the share of the population with incomes lower than the poverty level has decreased from 68.1 percent (1996) to 49.0 percent (SPPRED), according to recent research carried out by national agencies together with the World Bank. A poverty reduction step reflects the result of policy carried out by the government and international organizations, including UNDP for the fulfillment of MDGs (Table 1.1).

According to measurements for this Azerbaijan Human Development Report, the country's HDI makes up 0.767, representing an increase of 0.9 units as compared to the figure measured on the basis of data on the country's socioeconomic progress for 2002 (0.758). The results of the measurements on the basis of the 2003 data are indicative of the progressive trend of growth for the HDI and its components (life expectancy at birth and education) for the years to come.

If we compare Azerbaijan's HDI components with relevant world indices, Azerbaijan significantly exceeds the world average by 15.0 percent for life expectancy and 19.6 percent for the education index. At the same time, Azerbaijan's GDP index is lower than the world average by 16.7 percent. Regarding Purchasing Power Parity (PPP), GDP per capita in Azerbaijan in 2001 ($2,936 UNDP, HDR 2003) was two times less than the world average, whereas in 2000, it was 9.4 times lower than that of countries with high income. These figures are indicative of the stable growth of per capita income and, correspondingly, the human development indices. However, the current state of the HDI does not realistically reflect the country's potential. There exists significant unused resources for economic growth and human development due to the country's intellectual and natural potential.

In terms of adult literacy, Azerbaijan compares to most developed countries in the world and has practically reached the maximal value of this index. An estimated 99 percent of the country's population 15 years of age and older is literate.

Less impressive are the issues related to educational enrollment at educational institutions of the first, second and third levels. In the context of the poverty reduction strategies, it is critical to achieve overall technological progress, increase the level of educational enrollment, and the development of professional skills and intellectual potential in the country. According to UNDP HDR-2002, the gross enrollment of education in Azerbaijan was 71 percent, based on data for 2000. This index for all three levels of education had decreased by the mid-1990s, due to the Nagorno-Karabakh conflict which led to the loss of territories and existence of refugees and IDPs.

These problems led to the reduction in the number of students in educational institutions at all three levels. In 1992, it was 68 percent and by the mid-1990s, it had fallen to 62 percent. Under the impact of the economic growth of 1996 and the following years, this most important indicator of the human development process began to grow and it had reached 71 percent by

2000 (UNDP, 1995-2002). It is assumed that the growth of this index is caused primarily by the component of the third level of education - higher educational institutions. The number of university applicants decreased from 19,500 in 1990/91 to 13,400 applicants in 1994/95. Then it increased rapidly: a total of 26,400 students entered state and private higher educational institutions in 2001/2002 (Table 1.3). However, this positive factor, from the point of accumulation of intellectual potential for scientific-technological progress should be viewed critically, as the number of students studying natural and technical sciences is actually decreasing.

The changes occurring in higher education indicate the growing potential of private universities to compete with state institutions. Between 1996 and 2001, the number of students in State universities and institutes rose by 5.4 percent; while during that same period, enrollment in private universities increased 43 percent. Further human development, which uses knowledge-based approaches will depend, to a significant extent, on the amount of attention which is paid to natural and technical sciences as many students are enrolled in social and humanitarian sciences. The greatest increase was seen in the field of economics, which doubled between the years of 1990 and 2000. The number of specialists involved in industry and agriculture declined by 25 percent over this same period a trend that can partially be explained by the low level of income and the poor social position of those engaged in these fields. To overcome these tendencies, special policies must be adopted. A higher number of students trained in those fields would strengthen technological progress, primarily, in natural sciences and engineering.

Table 1.1. Human Poverty Index HPI-2

1. Percentage of people not expected to survive to age 60 - 20.4%
2. Percentage of people who are functionally illiterate - 15.1%
3. Percentage of people living below poverty income - 49.0%
4. Rate of long-term unemployment - 1.3%

Table 1.2. Human Development Index in Azerbaijan and its Component Indices

World 2001		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
0.722	HDI	0.718	0.707	0.696	0.692	0.697	0.706	0.722	0.738	0.746	0.751	0.758	0.767
0.70	Life Expectancy Index	0.745	0.742	0.743	0.735	0.753	0.770	0.772	0.770	0.780	0.782	0.782	0.805
0.75	Education Index	0.870	0.880	0.880	0.880	0.868	0.871	0.878	0.880	0.895	0.895	0.897	0.897
0.72	GDP Index	0.540	0.498	0.464	0.462	0.470	0.477	0.510	0.560	0.563	0.576	0.586	0.600
7,376	GDP per capita PPP USD	2,540	1,980	1,610	1,590	1,675	1,740	1,850	2,850	2,936	3,148	3,300	3,650

Table 1.3. Institutions of State Higher Education (at the beginning of academic year)

	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002
Institutions of higher education	17	18	22	23	23	23	23	25	25	25	25	25
(1,000s)	105.1	107.9	99.6	94.3	89.2	86.3	82.4	79.8	82.3	88.5	91.0	99.0
Students per 10,000 population	148	150	136	127	119	113	107	103	105	112	114	123
Enrollments in the first grade (1,000s)	19.5	20.5	12.2	13.6	13.4	15.4	16.9	18.9	18.8	19,9	20.5	23.5

Source: SCS, 2002, 2003

1.3. Knowledge and Human Development

1.3.1. Current State and Opportunity for Progress

Today, the human development policy in Azerbaijan is targeted at overcoming poverty, which has put obstacles in the way of human development. The existing promotions in HDI (Table 1.1) are based primarily on the accumulated intellectual potential, knowledge and skills. Like other indices of economic and social development, Azerbaijan's intellectual potential has faced challenges, which have slowed down its development. Compared to the pre-transition period, the number of students of higher education establishments, employment rates at scientific research and designing institutions, as well as insufficient financing of education and research have all declined. State universities lead in the training of specialists in the country. This is particularly true in the fields of scientific research and engineering.

Along with State universities, the private higher education sector is developing rapidly. But, private sector universities mostly concentrate in the fields of economics, law, finance and education, as they have too limited a resource base to train scientific and engineering personnel and provide training labs with modern equipment.

Consider the following statistics: the number of students decreased from 148 per 10,000 of population in 1990/1991to 123 in 2001/2002. And then in the mid-1990s, it further decreased to 113 per 10,000. The financing for education (in percent of GDP) in reality did not decrease between 1991-1995 and following years but remained at around 0.04 percent of GDP per year. However, the real GDP in 1995 was only 41.8 percent of 1990. The GDP began to increase, starting in 1996, and was positively reflected in state budget revenues and expenditures, including the state financing of education. The UNDP and other international organizations and foreign countries, including both governmental and non-governmental institutions, also took part in improving the educational institutions in the various regions of the country.

In recent years, there has been a tendency for the number of university students to increase. State expenditures for education and scientific research have also increased due to economic growth. The number of those engaged directly in scientific research and technological activity has begun to grow, though only modestly, but only since 1999, following a reduction of the employment rate in this field by 36.5 percent in 1990-1998. Between 1998-2001, there was a 2.5 percent rate of growth in employment in these fields.

The recent upswing in the enrollment of university students and the employment rates in the natural sciences and technologies may receive support within the programs for poverty reduction (2003-2005) and ICT development (2003-2012), which have already been adopted for implementation. However, along with these programs, the country needs a new national high technologies development program, which covers an even wider spectrum of application than ICTs. The need for development of such a strategy is confirmed directly by the Technological Achievements Index (TAI), which identifies the priorities and which should constitute targets for national programs for development and use of technologies.

1.3.2. Technological Achievements Index (TAI)

For the first time, the assessment of Azerbaijan's TAI was carried out in line with the preparation of the National Human Development Report 2002. The 2002 assessment, using methodology proposed by the Global Human Development Report-2001 considered the country's position as satisfactory. With TAI magnitude between one as a maximum and zero as a minimum; the calculations based on the 2001 data placed this figure at 0.379. With such TAI value, Azerbaijan, under the UNDP-adopted classification, is among the countries with TAI from 0.350 to 0.490. Calculations based on the latest available data for 2002 show that TAI has increased by 11 percent and currently is 0.421.

TAI is based on the following four components:

1. creation of modern technologies
2. spread of modern technologies
3. spread of traditional technologies and
4. professional skills

The index of professional skills is a very important component of TAI, as it allows the assessment of human capital potential for technological achievements. The significance of this index is based on the average number of years of the population's education and the gross tertiary science enrollment ratio. Assessment of these components and comparison of the 2001 and 2002 results indicate that today, in order to raise TAI, it is necessary to pay

particular attention to the creation of modern technologies, natural science and technological products.

The index of modern technologies creation (0.008, 2002 data) depends on the following indices: number of patents issued per residents, royalty and licensed payments. According to Azerbaijan's e-readiness assessment report, there were 965 patents issued for inventions in Azerbaijan between 1995 and 2001, including some 840 patents to local declarants, on average, 120 patents per year (15 per 1 million citizens).

Such a low index of creation of modern technologies, which makes up several hundred per 1 million inhabitants in countries leading in this field, contradicts the high level of education in the country. Enrollment in educational institutions at the third level (23 percent) is close to the maximum figure, which UNDP assigns for international comparisons (Global HDR-2002).

Per 1 million citizens, 2,735 persons (UNDP, HDR-2002) are specialists engaged in a field where modern technologies can be created. This indicator in Azerbaijan is higher than average for countries in Central and Eastern Europe and the Commonwealth of Independent States (CIS), and insignificantly lower than the average indicator in countries with high HDI. At the same time, such a high potential of qualified human capital is not being utilized as a result of hardships of the transitional period and decrease of investments for research and development (R&D). An apparent consequence of this negative trend is the lack of products, which could have provided receipt of royalty and licensed payments to the country. In 2002, the government budget received more than $50 million in royalty fees. However, that amount could not be incorporated into the assessment of the index of creation of modern technologies. In 2001, Azerbaijan had a zero index in this regard.

Modern technologies creation indices, ther TAI components and TAI integral index are given in Table 1.4. Comparisons of the 2001 index indicate an increase in the distribution of modern technologies by 4.2 times as compared to convenient technologies (14.4 percent). Modern technologies distribution index has a stable tendency for growth, due to the widespread use of mobile communication facilities and expansion of Internet services (Chapter 2).

Another index, which impacts the modern technologies distribution index, measures the rate of products of new and medium technologies in terms of exports. Currently, this percentage of goods in total exports is low. Despite the expected progress in the development of non-oil industry branches, Azerbaijan will have problems supporting this index. Beginning in 2006, oil and gas exports will grow rapidly, which may cause a decrease in other products being exported, and the need for an accelerated development of non-oil industries.

An increase of TAI by 11 percent relates to the expansion of the market of cellular and cable communications lines and the growth of electricity consumption per capita. All these indices should help to alleviate some of the poverty and help to sustain growth.

The dynamic of professional skills index will be modest. This index has not risen since 2001 and continues at 0.690. The gross education coefficient for the natural sciences (at the third stage) is assessed as 14.1 percent (Profile calculations by data provided by the State Statistics Commit-tee). In the future, in connection with the development of a multi-sectoral economy, an increase of market demand is expected in specialists' services and relevant responses by youth. This already takes place in branches related to training specialists for the oil industry.

Table 1.4. TAI and its Indicator for 2002

Indices	2002
Modern technologies creation index	0.008
Modern technologies distribution index	0.182
Traditional technologies distribution index	0.803
Professional skills index	0.691
TAI	0.421

1.4. Modern Technologies and Economic Base of Human Development

Despite the steady rate of growth brought about largely by investments in the oil sector, Azerbaijan's economy still cannot provide demand supported by the necessary investments in hi-tech products. In the years of economic growth between 1996 and 2002, only individual sectors of the economy and a few enterprises managed to apply modern technologies effectively. Among enterprises with state-of-the-art equipment, we can name those of the oil

and gas producing, petro-chemical, power engineering, metallurgic and food industries. Among other economic sectors, the telecommunication sector is the most advanced sector in terms of exploring the newest technologies. At the majority of old industrial enterprises, equipment and technologies are outdated.

For the period between 1998 and 2002, which differs from previous periods in terms of the active involvement of investments in the economy, the fixed assets were renewed by around 3.4 percent each year. However, the renewal of technological assets involves a limited number of sectors and enterprises. At the majority of industrial enterprises, retirement of assets prevail over their renewal. Average annual data for 1998-2002 show that the renewal of fixed assets made up 4.2 percent for oil and gas extracting enterprises.

In the oil and gas extraction sector, there has been a stable process of renewal of fixed assets. In this sector where foreign oil companies are operational offshore and onshore, renewal of fixed assets made up 4.2 percent per year. These figures demonstrated that among the oil industry and international oil companies, first of all BP and its partners play an important role in human capacity building as an essential element of human development.

The process of renewal of technologies in the food processing industry was relatively even, with the speed of fixed assets' renewal of 4.2 percent per year between 1998 and 2002. In other industrial branches, renewal of assets was of discrete nature and associated with a short-term investment programs. For example, in 2000, the fixed assets were renewed by 59.4 percent in the tobacco industry. In 2000-2002, the fixed assets were renewed by almost 23 percent in oil refineries and by around 15 percent in the chemical industry. Regarding the other branches of the economy, the most active processes are taking place in the telecommunication sector where outdated cable telephone lines are being replaced by digital ones. A survey among potential Internet users confirms that the lack of reliable communication lines prevents them from entering the World Wide Web. Telecommunications have become one of the determining infrastructures for Azerbaijan's economic transition to the technological revolution.

Although Azerbaijan has shown considerable growth in economic development, this success should be considered only as a prerequisite for technological and sustainable development in line with world progress. There are necessary human and natural resources required for that. However, there is a shortage of investment funds needed for wide-scale involvement of modern technologies in the economic and social sphere.

Foreign investments are the main source of investments. Capital investment in Azerbaijan's economy between 1993 and 2001 was 22,800 billion manats with foreign companies investing 80.3 percent. Therefore, foreign investments in these years have been the main source of rehabilitation of the national economy on a new technological base. However, it is necessary to state that foreign investment has created sufficient conditions for a technological breakthrough in the context of covering all the fields of economy and social life. A significant portion (more than 76 percent) of foreign capital was invested in the oil sector.

Between 1995 and 2001, foreign companies invested $6.9 billion in Azerbaijan, including 79.7 percent as direct foreign investments. During this period, the credits issued primarily by bilateral structures for financing the projects including ICT-oriented ones, exceeded $1.4 billion. The foreign direct investments were partially used for ICT development also by joint telecommunication companies such as AzEuroTel, Azercell and Bakcell. Following the oil industry, the telecommunication sector is the second most active field for foreign investments. ICT is also developing within the oil sector, which ensures involvement of local personnel in using these and other modern technologies.

Foreign investment in the non-oil sectors of the economy are basically insignificant. There are studies, which claim that for every dollar spent in the oil sector where oil projects are being implemented, an additional $0.50 is invested in other branches of the economy.

In Azerbaijan, this ratio is now only 11.3 percent (Table 1.7). The new technology-based telecommunication, metallurgic, food and cement enterprises, established by foreign investments, are the major contributors to GDP after the oil sector. In these enterprises, wages twice exceed the average wage in the country (which stands at approximately $65 per month).

The poverty reduction strategy for 2003-2005 envisages the expansion of state involvement into the investment projects on the base of modern technologies as well as attracting project-designed credits under the government's guarantor. According to the government, $8 billion will be invested in Azerbaijan's national economy between 2003-2005, including state budget assets of around $320 million (Table 1.7). Direct foreign investments in non-oil branches are anticipated at $450 million. The government has been discussing a state investment program for the future. Simultaneously, according to the government, a project on the creation of the

Foreign Investments Agency (FIA) is currently in the process of becoming institutionally legalized. The FIA will also contribute in attracting foreign investments.

The real economic growth between 2003-2007 is about 112.0 percent because there has been an average annual growth of 14.6 percent. By attracting investments and using modern technologies to develop the potential of non-oil branches, the growth of these branches is predicted at around 71.0 percent as compared to 154.0 percent in the oil sector. The real growth in the telecommunications sector in 2003-2007 is expected to be about 124 percent.

It is anticipated that the role of modern technologies and ICT in economic growth in the next years will witness qualitative changes, especially in relation to information technology. By attracting direct foreign investment, project-designed credits and domestic investment funds, new kinds of equipment and technological means will be involved in production. For this period, it is reasonable to expect an increase of the share of expenditures for equipment in the structure of fixed investments. According to the State Statistics Committee, this index was less than 24 percent in 1999-2001. Progress in this field should ensure a more efficient national economy, which can be more competitive in foreign markets. This will require considerable effort, which is needed to ensure that the equipment and technologies, especially those demanded by foreign companies, reflect the newest technological achievements. Failure to diminish and eliminate technological lag would result in what the UNDP refers to as “development without future”. Another important factor is to provide for the scientific capacity of the technologies that will be launched. This will effect employment rates, the development of natural sciences and engineering, and help to develop human capital to generate ideas and create modern technologies. It should be noted that ICT are the tools and necessary elements of nearly all modern technologies. From this viewpoint, ICT development provides the base for development and use of modern technologies, including advanced technologies.

In the coming years, ICT will not only expand its role in economic growth as a more perfect means of communication, but they should become one of the tools of Azerbaijan's market. In this capacity, ICT should influence all aspects of the production of goods, involving more effective manufacturing and transfer to the market. Removal of regional disparities in access to ICT resources, which currently are concentrated in Baku, should create equal logistical and information conditions for competition among producers. This is particularly important for rural areas. A developed network of business-incubators, oriented at formation demands, will contribute to their more clear orientation in selecting priorities for activity and, in general, increasing their motivation for working in the market.

Table 1.5. Azerbaijan's TAI as compared to other countries

TAI index	Characteristics of groups and country-leader
0.50+	Leaders
0.35-0.49	Potential leaders
0.20-0.34	Dynamic introducing technologies
0.20	Marginal group
0.42	**Azerbaijan**

Table 1.6. Foreign Investments, in millions, US Dollars

	1995	1996	1997	1998	1999	2000	2001	Total 1995-2001
Total	375	621	1,307	1,472	1,091	927	1,092	6,885
Credits	220	102	196	120	336	263	193	1,429
Oil sector	140	416	780	892	545	546	821	4,139
Non-oil sector	15	103	331	460	210	118	79	1,316

Source: SCS, 2002

Table 1.7. Forecasted Economic Indicators of the Azerbaijan Republic (Millions in US Dollars)

	2004	2005	2006	2007
Investments by all sources (including foreign investments)	2,669	3,103	2,844	2,864
Internal investments	684	721	770	814
Total foreign investments	2,986	2,381	2,074	2,050
Project credits	240	250	260	260
Direct investments	2,746	2,131	1,814	1,790
Of which: oil sector	2,490	1,960	1,630	1,570

Source : Main Forecasted Economic Indicators (ECONOMY.gov.az)

Table 1.8 GDP Real Growth Rate, 2003-2007, in percentage

	2003	2004	2005	2006	2007	Average yearly
GDP	12.1	9.0	14.3	23.4	14.1	14.6
Oil sector	1.4	9.7	22.2	55.5	20.2	21.8
Non oil sector	13.1	10.3	11.5	11.1	10.9	11.4
Communications	28.0	10.9	15.0	19.0	15.6	17.7

Source : Main Forecasted Economic Indicators (ECONOMY.gov.az)

1.5. Conclusion

Human development and poverty reduction, which are the most important Millennium Development Goals and the use of ICT and other modern technologies, remain among the State's priorities for developing a civil society in Azerbaijan. Deepening the understanding of the importance of these goals is reflected in the programs for various sectors of economy and public life. The key and strategy for MDGs the State Program for Poverty Reduction and Economic Development, which was adopted in February 2003. Measures in this direction will strengthen human development in Azerbaijan. Azerbaijan has already experienced certain successes related to this goal. This was reflected by integral indicators of the assessment of human development such as the Human Development Index (HDI). National experts have carried out the monitoring of HDI in Azerbaijan since 1994 with support from UNDP. The National Human Development Reports help the national government and the community to gain a better understanding of further measures that are necessary to increase human potential and the creation of human gold. In the field of human development, the following positive trends have been documented:

- Stable growth of the Human Development Index and its integral components. Such growth has been observed since 1996 and, undoubtedly, will grow as the GDP increases. Throughout the years of growth, an increase in the HDI was influenced not only by the annual growth of GDP (which on average was approximately 10 percent). This also has led to the rise in the education index and the enrollment index.
  The enrollment index is no longer declining. This is particularly important as it relates to the enrollment index of tertiary educational institutes, where professional skills of human gold are formed. In cooperation with international institutions (UNDP, UNESCO, World Bank and others), a national education reform program is being implemented.

- In 2003, a National Strategy for ICT development was implemented, which will facilitate the country's transition to an information society.
  Although the economic growth, reflected by high rates of growth of GDP, seems impressive, the following problems still exist:

- The use of all resources for economic growth and increase of human development index is not integrated.

- The economic growth of recent years is associated primarily with the development of the oil sector, which is mostly oriented to extracting crude oil. The projects in this sector, which are implemented with direct foreign investments, provide for foreign exchange influx. However these projects have not yet stimulated adequate attention of the foreign investors to other sectors of economy. It, therefore, cannot be

considered stable, due to fluctuations in the prices of crude oil. Only in the individual branches of the industry are new enterprises with state-of-the-art equipment and technologies being established. As a consequence, the following conditions exist:

- Poverty, regional and gender disparities in Human Development Indices;
- Delays in the investment projects in the non-oil sectors of the economy prevent the creation of job opportunities which are highly profitable for the country both in terms of employing personnel and bringing money into the state budget;
- Unemployment has not been fully investigated and the official statistical data of this problem cannot be relied upon, which complicates the measurement of Human Development Indices;
- Limited demand for skilled labor suppresses young people's motivation for becoming educated in natural sciences and engineering which, in turn, limits the boundaries of scientific research and the relevant creation of scientific and engineering personnel. These and other urgent problems, not reflected in the report, require the attention of the government and other national institutes. Among them, the following policy recommendations are of crucial importance for increasing human potential:
- The development and fulfillment of a national strategic program for the development of modern technologies from the perspective of an ICT development strategy. Such programs could be developed under coordination of the Cabinet of Ministries with support of international organizations and the involvement of NGOs. Acceleration of human development and human gold formation in the country provides the necessity for implementation of relevant measures.
- Creation of regional and sectoral programs and action plans in the field of human development.
- Greater increase of Human Development Indicators and the elimination of regional and gender disparities, human gold formation development of a State mid-term and a longer-term investment program and projects should be ensured. Regional and infrastructural aspects of such programs require particular attention.
- Development of regional business incubators to strengthen regional industrial entrepreneurs and farmers' access to ICT resources and marketing resources for more successful development of human potential through expansion of economic capabilities and an increase of the level of knowledge and qualifications.

INFORMATION TECHNOLOGIES AND HUMAN DEVELOPMENT: DIFFUSION AND APPLICATION OF ICT

Chapter 2

2.1. Introduction

Information and the processes of human society development have always been interconnected. The creation and spread of new information technologies are a continuous process. Just like the general development of civilization, there is also continuous progress in forms, methods and technological means of creating, processing and supplying of information resources. Therefore, the development of new information technologies and their integration into the everyday life of people are major tasks for the future and of particular importance for achieving MDGs.

The stabilization of the economic and financial markets in Azerbaijan since the mid-1990s has enabled the technological restructuring of production in Azerbaijan, including the field of information technologies. Information and communication technologies have become an important component in the processes of liberalization of the economy and should be used for facilitating issues related to democratization. The cooperation of the national government and non-governmental organizations with international organizations plays an important role in the implementation of these processes. The steady rate of economic growth provides a basis to assume that telecommunications have a huge potential for development and will be playing an increasing role in the country's economic and political life in the near future. Modern

information technologies have become an important element of the educational system, especially in the system of admitting university students. The growing per capita incomes of the population should also increase the household requirements for services of telecommunication companies, stimulating further development in this sector.

“National Information Communication Technologies Strategy (2003-2012) for the Development of the Republic of Azerbaijan” reflects this state policy, and its implementation is expected to make a breakthrough to integrate Azerbaijan and the developing global information community.

This Chapter is dedicated to the assessment of modern state and perspectives in the field of ICT for human development and the achievement of MDGs.

2.2. Information Technologies Development Status

2.2.1. Current Profile of the Sector

These days, the ICT sector of ICT is one of the most rapidly developing sectors. It plays a significant role in Azerbaijan's economic and political development and steadily contributes to the Gross Domestic Product.

The growth of benefits from ICT is explained primarily by the rapid development of segments of the cellular link and Internet access services. In 2000, the growth of benefits from the services of a traditional cable telephone network increased 2 percent when compared to the previous year but the growth of benefits of cellular link operators reached 20 percent over the period 2000-2002. The physical indices of the development of cellular link segments and the Internet have also grown at enormous rates. The perspectives of development of cellular link and Internet services are still highly appreciated. It is assumed that this can be ensured by the potential capacity of the market (both quantitatively and qualitatively in regard to cellular link and Internet services) under a simultaneous economic growth and increase of real incomes of the population in Azerbaijan.

The development of the ICT sector also has had a strong impact on the formation of public relations in Azerbaijan. Telecommunication and information technologies ensure an increase in the level of people's awareness and are of significance for the formation of civil institutes and democratization of the community. Along with an apparently growing application of new information technologies in state institutions and national businesses, mass media also observes an increase in the number of users of the Internet (newspapers, news agencies, net radio and television).

Telecommunications expanded, especially after 1995-1996 when the position of the economic and financial markets in the country became more stable. Priority programs for the sector's development have since included the modernization of cable communication lines, transition to fiber optic and satellite communications for international link channels, development of the cellular communication links, enhancement of the international television networks and expansion of the network of e-mail and Internet providers.

2.2. Information Technologies Development Status

2.2.2. Traditional Telecommunications

The ICT development has generated a need for adequate traditional telecommunication links. Of the 420,000 cable telephone lines existing in Baku, the national operator, the production unit Baku City Telephone Station handles 375,000 lines (89 percent share of the market), while Ultel handles 15,000 lines, Catel has 10,000 lines, and AzEuroTel has 20,000 lines.

Currently, digital equipment already covers 37.1 percent of the telephone stations in the country. However, there are considerable regional differences in the modernization of the existing telephone lines. According to the latest available information, although 41.2 percent of Baku stations ensure dial-up connections, only 28.1 percent of regional stations can. It is planned to complete the telephone network's transition to the dial-up system by 2007, simultaneous leveling out differences between Baku and regions at all stages.

The equipment of the international trunkcall system is being upgraded as well. In 1991, there were only 30 direct satellite channels; now the figure exceeds 800. Direct channels currently connect the country with the world's major capitals and other centers.

In line with the project of Trans-Asia-Europe (TAE), a network of fiber optic communication lines has been put into operation, expanding the ability of dial-up technologies in the communication infrastructure. A fiber optic communication line is also being built along the Baku-Tbilisi railroad as part of the project of Transport Corridor Europe-Caucasus-Asia (TRACECA).

Despite some progress in the development of traditional means of telecommunications, the availability of these services throughout Azerbaijan does not meet the demand, and the cost of some of these services limits access for customers. Among the 12 Commonwealth of Independent States (CIS) countries, Azerbaijan ranks No. 8 according to the number of telephones per 100 inhabitants (10.84), but with some differences in capital and rural areas. This is lower than average in the CIS. Rates for international calls from Baku are twice as high as those from the average CIS countries. Azerbaijan ranks No. 11 according to the price of international calls. The monopoly is the main obstacle in decreasing the rates of the international calls. Consequently, the number of outgoing international calls (1 million minutes per year) in Azerbaijan is six times lower than the average of other CIS countries, putting Azerbaijan in next to the bottom of the list.

According to the Ministry of Communications, there are 225 TV stations, which use 339 transmitters to provide broadcasting of national, local and foreign programs (Source: Transport and Communications of Azerbaijan Statistical Yearbook - 2002). The number of TV stations doubled between 1997-2001. Most TV stations have only the capability to transmit with 100 watts or less. Only 19 TV stations have the strength of 1 kilowatt or more. These stations broadcast programs nationwide, as do both national and privately operated channels from Turkey and Russia. Of the 339 transmitters, 38 use main and microwave lines, and 250 use satellite lines.

Table 2.9 Telecommunications in Azerbaijan (January 1, 2003) PSTN (Public Switched Telephone Network)

Total PSTN Telephone Lines	982,500		
PSTN Switches	Nakhchivan Autonomous Republic	Baku	Total in Azerbaijan
Step by step		6.3%	4.0%
Cross-bar		45.7%	55.0%
Digital	100%	48.0%	41.0%
Telephone Lines per 100 Families		97.41%	53.66%

Source: SCS, 2003

2.2. Information Technologies Development Status

2.2.3. Cellular Communication

Cellular telephone communication is currently the most developed field of ICT in the country. Two cellular link operators Bakcell (GSM 2,000) and Azercell (GSM 900) had a total of 808,100 clients as of January 1, 2003 (State Statistics Committee). Cellular communication covers approximately 80 percent of the country's territory. Both companies have ambitious plans to expand their client base. In particular, Azercell plans to increase the number of its clients by 700,000 and its coverage up to 95 percent of the territory. Bakcell, which has some 120,000 users, invested $10 million in 2001 to increase its client base to 200,000. But these plans are restricted by the low incomes of the population. Despite the rather low income per capita Azerbaijan is one of the leading states in the CIS in terms of telephone clientele per 10,000 populations.

Both operators offer international roaming, which is relatively expensive. In advance paid cellular communication services, mobile banking, Internet, the Short Message Service (SMS) and other additional services have allowed operators to attract clients from pager communication and other communication sectors. In July 2001, Azercell, in cooperation with ISP Azeronline, presented mobile Internet in Azerbaijan.

According to a survey by the World Bank, Azerbaijan ranks first among the CIS states in terms of cellular communication link distribution among clients.

Table 2.10. Azerbaijan: Growth of Mobile Telephone Subscribers (1993-2002)

Year	Bakcell	Azercell	Total	Growth
1994	2,000	-	2000	-
1995	5,000	-	5000	250%
1996	12,000	2,750	14,750	295%
1997	18,000	20,371	38,371	260%
1998	26,000	55,831	81,831	213%
1999	30,000	179,640	209,640	256%
2000	70,000	380,414	450,414	215%
2001	120,000	519,346	639,346	142%
2002	-	-	808,100	126%

Source: SCS, 2003

2.2.4. Internet

Currently, 14 Internet Service Providers (ISPs) are rendering Internet services across the country. An estimated 2 percent of the country's population are currently permanent Internet users. Practically all the providers are rendering the full spectrum of services on access to Internet both dial-up access and line access. On average, the users are provided with the speed ranking from 56 k/second to 2 M/second. The cost for one-hour access to the Internet, which was approximately $2.00 in 1997, has dropped to $0.40 as of April 1, 2003.

Reduction of the price is one reason for the growth of the number of Internet users in Azerbaijan. Currently, it is cheaper for individuals and organizations to opt for unlimited monthly access to Internet, which can be purchased for about $30 to $50, depending on the provider. All in all, prices for Internet access in Azerbaijan are declining (Figure 2.2).

At the same time, the development of the Internet market has been hindered and slowed down by Aztelecom's monopoly. As a result, major ISPs have begun using satellite channels to ensure affordable services. However, regional access to the Internet is highly disproportionate compared to Baku. There is very little access throughout the countryside. Of the 14 ISPs, 13 (private providers) service only Baku. Poor business development and low household income throughout the provinces limit the demand of Internet services. Only Bakinternet (the Internet provider of the Ministry of Communication) operates in the provinces, covering the entire territory of the country with its services, according to the Ministry. It should be noted that young people constitute the overwhelming majority of Internet users. Thanks to subsidies from incomes in other monopolistic segments of communication, the Ministry can compensate the negative cost balance in providing this service in the regions.

Over recent years, an intensive growth in numbers of Internet users in Azerbaijan has been observed, not only at home but also at Internet cafes and Internet clubs.

One of the factors positively promoting the growth of users among youth is linked to free Internet access provided by various universities. In addition, some secondary schools have also begun to provide this opportunity. This trend is fostered by the implementation of educational programs in the country through cooperation of the Ministry of Education with international organizations, such as UNDP and diplomatic missions. The government of the Azerbaijan Republic and UNDP signed a joint project to establish up an National Information Communication Technologies (ICT) Development Strategy and its implementation in Azerbaijan. The use of ICT will create opportunities to upgrade many spheres of public life and accelerate Azerbaijan's integration into the international community. Educational programs in the field should also focus on informing users about the potential of the Internet in order to expand usage beyond chatting and e-mailing to fields related to personal training, life-long learning, information search and democratic participation. Currently, the Internet is mainly used for chatting and sending e-mails, a fact which is also influenced by the age of the users.

The international oil companies operating in Azerbaijan are also partaking in capacity building for spreading new ICTs through equipment and training. In line with human development tasks within the Azerbaijan International Operating Company (AIOC) in their Azeri-Chirag-Gunashli oil field (ACG) Project on the expansion of the oil terminal in Garadagh, their Human Development Center has been engaged in spreading ICTs both through the transfer of equipment to schools and libraries and in training as an element of human potential development in the framework of their social investment program. This activity has contributed not only to spreading ICTs but also to reducing regional disparities in this field. In addition, it should be noted that practically all local employees of energy companies have access to modern ICTs and possess the required knowledge and skills in this field.

Companies, which provide Internet services, are eager to increase the number of their users. To achieve this goal, they organize various training courses for potential users to work at the Internet. For instance, the Baku Scientific Training Center, jointly with the Network Technologies and the Internet News newspaper has prepared Microsoft Office 2000, an educational multimedia product in Azeri. The training course has been designed to enable every user to test his/her knowledge of the system after every lesson. The training course has been designed for users with minimum experience using computers. The cost of this product, recorded on 3 disks, comes to about $8. At the same time the Baku Scientific Training Center offers permanent courses for a price to train professional specialists using Microsoft products. A 240-hour training course costs $50.

Since August 2002, in order to facilitate access to the Internet, “IntraNS” company has been providing a new kind of service access to the Internet via a plastic card. Recently other providers also have begun offering such services, which enable every user to set up a computer and modem and to be registered on the Net. The cards cost between $5 and $55 and contain (ID) dial-line information and offer limited (between 10-50 hours) or unlimited access to the Internet along with a free mailbox.

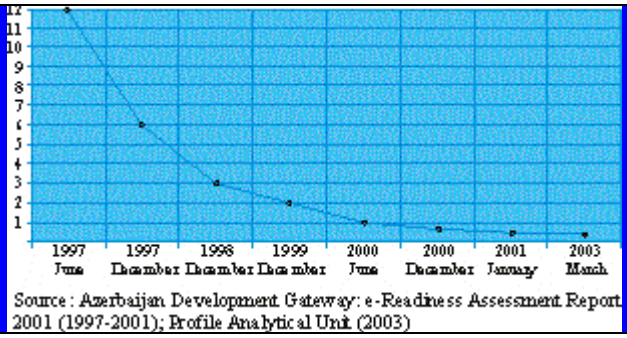
Despite the achievements in the business environment and in the private use of Internet, Azerbaijan cannot yet be viewed as having successfully made the transition to an information society. The adoption of the National Strategy is an important step to eliminate this lag.

Table 2.11 Data on telecommunications of Azerbaijan for 2002

№№	Main indicators	Data of the Regional Commonwealth of the Communication and Telecommunication Conception of Azerbaijan					Rank in CIS - Azerbaijan 2001
		Azerbaijan	RCC		Conception		
			Average CIS	Pages	Average data	Pages	
1.	Number of telephones per 100 residents	10.84	14.53	18	12.9	42	8
2.	Number of telephones per 100 residents in capital	23.4	28.24	23	42.8	42	7
3.	Number of telephones per 100 rural residents	3.63	5.75	18	-	-	7
4.	Number of Internet users per 10,000 residents	32.13	109.10	34	-	-	10
5.	Specific gravity of investments of their own sources (%)	41.9	75.3	102	-	-	12
6.	Average annual number of communication employees (per thousand people)	10.60	57.60	87	-	-	6
7.	Percentage employees working in communications compared to the number of employees, engaged in economy of the country	0.43	0.78	88	-	-	12
8.	Average monthly salary of employees in telecommunications ($)	$92	$107	107	-	-	8
9.	Outgoing international telephone traffic (millions of minutes)	29.60	177.20	53	-	-	9

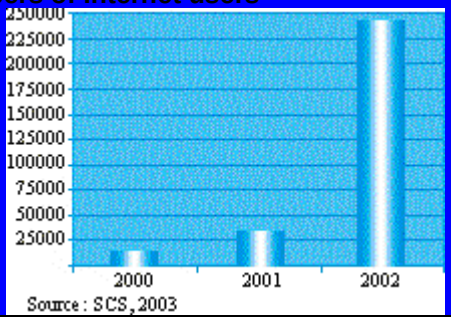
Source : Profile Analytical Unit (2003)

Figure 2.2 Internet access rates in Azerbaijan, in US dollars, per hour (1997-2003)



Source : Azerbaijan Development Gateway: e-Readiness Assessment Report 2001 (1997-2001); Profile Analytical Unit (2003)

Figure 2.3 Growth in numbers of Internet users



Source : SCS, 2003

Table 2.12. Age of Internet Users (2002)

Age	Users
14 to 18	27.8%
19 to 25	36.1%
Over 25	36.1%

Source : Survey, 2003

Table 2.13 Structure of Internet contacts

Internet Usage	Users
Chatting	22.1%
Sending e-mails	21.2%
Search	18.3%
Games	11.5%
Participation in forums	8.7%
Other	18.2%

Source : Survey, 2003

2.3. Perspectives of Information Technologies Development

2.3.1. Prerequisites

There is sufficient infrastructure for the ICT development in the country, along with technological modernization in other segments of economy and public life. The Azerbaijan government and UNDP launched the project “National ICT Strategy for Development and Its Introduction” which led to the “National Information Communication Technologies Strategy (2003-2012) for Development of the Republic of Azerbaijan”, which President Heydar Aliyev signed on February 17, 2003.

International experts along with national experts conducted a study of Azerbaijan's e-readiness for transition to an information society in the spring 2003. The results indicated various positive factors, which promote Azerbaijan's integration with the developing world's information society. At the same time, both objective and subjective obstacles complicate this process.

On the positive side, the most determining factors relate to the sustained economic development and rich natural resources, along with the high level of literacy and education. In addition, Azerbaijan has a favorable geographical location with international transport links

and main communication lines connecting Europe and Asia. Also political and economic reforms in Azerbaijan have created a relatively favorable environment for foreign investors. Investors from the Organization for Economic Cooperation and Development (OECD) member states occupy positions in leading branches of Azerbaijan's economy and their readiness to take an active part in the country's technological modernization will promote the development of ICT infrastructure and modernization of the hardware.

The existence of private operators in the field of telecommunications and their expanding numbers, especially in the fields of Internet and cellular links, help to create conditions to reduce the prices for services. ICT has already been used widely in a series of national projects, involving the banking sector, ecological monitoring, tourism development, separate transport infrastructure segments and others. The modernization and development of the telephone network and dial-up channels and the formation of the cellular telephone network are taking place at a relatively rapid rate, expanding the opportunities for the majority of provinces to join Internet via a remote link.

The measures, established in the human development and poverty reduction program, should ensure further liberalization of the investment environment and favor new investors coming to Azerbaijan. This will provide expansion of the ICT services market along with commercial incentives.

Analysis of the country's full electronic readiness, including ICT infrastructure, computer hardware and software, information resources, information services and the legal base shows that initial conditions for the acceleration of the process of the establishment of the information community exists but objective hardships still remain. The government has defined these hardships as negatives, which should be overcome in line with the ICT Development Strategy.

Box 2.2. National Information Communication Technologies Strategy Emphasising the Existing Impediments to be Overcome

- Appropriate state policy which would determine directions for ICT use-related work and its priorities and guarantee of coordination of steps were not determined in full.
- The legal base regulating ICT usage has not yet been developed comprehensively.
- As a result of the country's transitional period and the existence of approximately 1 million refugees and Internally Displaced Persons (IDPs) the government cannot assign enough funds for ICT applications.
- “Brain Drain” and “Gene Drain” to developed countries in connection with the transitional period.
- Population's poor awareness of ICT advantages and opportunities.
- Low level of general computerization in Azerbaijan.
- ICT-related subjects at all levels of the educational process do not meet modern requirements.
- “Dial-up gap” between rural and urban locations in Azerbaijan.
- Serious problems in the wide usage of the Azeri language in the ICT field, especially insufficient software support of the Azeri language due to its unique, one-of-a-kind alphabet.
- Very slow process of the formation of national information resources.
- The Republic still lags behind many international ICT integration processes.
- Communication tariffs existing in the Republic create serious obstacles for ICT use.
- Existence of the government's monopoly prevents innovations and fair competition in the telecommunications field.

2.3.2. Perspectives of Scientific Developments in ICT and other Modern Technologies

The Law “On Science” which is currently being discussed in Parliament is likely to be adopted in the near future. It focuses on scientific research. The law is intended to promote efforts to make scientific research in Azerbaijan more competitive and more focused in finding solutions to problems in sustainable and human centered development, project and budget management. The expected increase of state budget revenues will create the opportunity to

involve state funds in research institutes and establishments and to promote hi-tech research and train personnel to work with information technologies.

Meanwhile, a developed network throughout Azerbaijan's universities and scientific organizations ensures annual graduation of some 2,000 certified specialists with basic knowledge and skills related to ICT professional use. The State University of Baku, the Oil Academy and the Institute of Cybernetics of the National Academy of Sciences of Azerbaijan lead the educational and scientific institutes in successfully training IT specialists and conducting fundamental and applied research. These institutes have accumulated their own experience of applied and practical work related to fundamental sciences; production processes management systems and IT applications in the field of communications, including satellite and fiber optic communications.

The Azeri Scientific Research Network Association (ASRNA) was established to develop research-related ideas and projects, such as appropriate methods to promote ICT achievement and to apply such technologies in the oil and gas industry and other industry branches. This association helps to promote the implementation of ICT and develop new technologies. ASRNA will promote linking universities and research agencies with the help of fiber optic systems, designated for local communication, as well as radio communication and satellite communication. This should improve the quality of research. The E-readiness study of Azerbaijan indicates that Azerbaijan's scientific research potential was appreciated as one of the highest during a series of meetings held by NATO in the Caspian area.

Oil comprises the major sector of Azerbaijan's economy and its demand for technologies stimulates the development of applications both in ICT or institutional development oriented to other science and technology branches. One of the main achievements of the national scientific research institutes was their development of a strong mathematical model based on Fuzzy Logic for optimal placement of platforms in the oilfields.

The Institute of Cybernetics of the National Academy of Sciences (ICNAS), one of the leaders in the technological intellectual market, offers its products not only to the oil sector, but also covers fields of medicine and other applications. The most important development by ICNAS for the oil and gas sector is software for diagnostics of sea oil and gas production platforms, and diagnostics for the process of drilling and determination of seismic stability of the deepwater sea stationary platforms.

The political goals brought about by sustainable development programs will create the institutional base and resource base for the rehabilitation of multi-profile production of goods and services. On the one hand, the ICT sector is the most important infrastructure for the production of goods and for the provision of interaction between manufacturers of goods at both local and international markets. On the other hand, ICT increases efficiency and the commercial level of manufacturers, which, in turn, enables them to supply the market with hi-tech and a wide range of goods.

Taking into account the great potential of human capital and the results that already have been achieved in both hardware and institutional issues, the following forecasts can be made:

- The country's scientific, technical, economic, intellectual potential will facilitate the increase of ICT-production export and services;
- Over the 10 years of the Strategy's duration, Azerbaijan can increase exporting ICT productions and ICT-services tens of times to reach the level of $500 million by 2011;
- Azerbaijan can become a center of Trans-Caspian Cybernetic Market (TCCM);
- Azerbaijan can become an e-Business integrator in Trans-Caspian region. Fulfillment of these goals will depend wholly on the government's efforts to lessen dependence on the oil sector.

2.3.3. E-Business

The National Development Strategy is being developed and will focus on improving e-governance, e-competency of enterprises and availability of infrastructure for conducting of e-business and e-commerce.

Existing Websites of local and international private organizations operating in Azerbaijan represent consulting firms, IT companies, banks, insurance companies, transportation companies, mobile telecom operators and ISPs.

Websites usually provide general information on the organization and services provided, photos of products offered, contact information, and on-line consultancy for the clients. The Websites of banks provide information about recent financial news and information, services

provided, various applications on loans and credits, which can be printed out and completed in advance. At this time, banks still do not offer their clients home banking via Internet.

A center for the authorization of electronic credit cards, Visa and MasterCard has been established by Azericard Processing Center and will be fully implemented. Many banks of Azerbaijan Republic already are members of the international system Europay International and offer the following cards: Visa, MasterCard Gold, MasterCard Standard, Cirrus/Maestro, and Virtual Card.

The International Bank of Azerbaijan has introduced the Internet Card that allows purchasing goods and services online. It was obvious that businesses constitute the main driving force for e-commerce development as they realized e-shop benefits and were very enthusiastic about using them.

An electronic system of inter-bank payments in real time is being implemented in the banking system of Azerbaijan. A few Web sites represented sales dealers of various manufacturing products.

There are Web sites such as AzerbaijanEmarketplace.com or Azerbaijan Electronics (AZEL.net) which provide their valuable resources for those who want to expand their business in the Middle East, CIS countries, Africa and the Indian subcontinent, buying or selling from outside or within the region.

Various industries are presented at BAZAR-az.com. This site provides information about producers of goods, as well as the description and prices of goods.

Moreover, it contains information on product delivery and transportation. It is possible to sell and buy as diverse a range of products as cars, paper, oil and corn via this site.

The National Bank of Azerbaijan has implemented Azerbaijan Interbank SWIFT Payment System since 2001. The system consists of three main components:

- CAS - Central Accounting System (conducts payment functions);
- SWIFT System of World Interbank Financial Telecommunication that secures usage of real time payment system;
- CIM - Central Interface Module (secures connection between CAS and SWIFT).

2.3.4. Ethnic Knowledge and Modern Technologies

In a nations' progress for sustainable development of intellectual potential, ethnic knowledge plays an important role and often becomes the stimulus for scientific research and innovation.

Numerous historical facts and local knowledge, particularly in the fields of medicine, traditional agriculture and food processing, settlement organization, dwelling construction and household management have been preserved up to today. In Azerbaijan, since ancient times, knowledge has been applied to mobilize natural resources and cultural heritage which, if combined with modern technologies, could further strengthen the sustainability of the human development process and the transition to a new level of civilization, based on traditional ecological principles ("ecocivil").

Use of ethnic knowledge can stimulate the production of traditional Azerbaijani products, which are capable of finding their place in the world market. These products may be agricultural or industrial goods. Along with the sustainable production of products and goods, the approach to combine ethnic knowledge with modern technologies also supports ecologically justified management of waste products. This approach is fully in line with the requirements to build up environmentally sound economic activity, capable of meeting the task of establishing human settlements and mode of life, relative to the needs of the 21st century. The combination of traditional ethnic knowledge with new scientific ideas and results obtained has begun to play an important role in the production and utilization of medicines, foodstuffs and food additives which decrease the risk of cardiovascular, cancer and other diseases.

The increasing average life span in the world and the change of the age structure of the population make this field of traditional and modern knowledge extremely important. These principles underline some of the elements of policy recommendations for the utilization of modern technologies for sustainable and human development in country.

The Union of Inventors of Azerbaijan (UIAZ), which emphasizes the use of traditional knowledge in medicine, has developed a model of mini clinics, aimed at implementation on a countrywide scale. Requiring only three staff members, such clinics can provide primary diagnostics and medical treatment for up to 6,000 people per year. The spectrum of activity of

these mini clinics covers 11 branches of medicine. The work of such mini clinics involves a wide use of thermal-puncture practices (childag), which have been developed by UIAZ.

2.3.5. Information Technologies in Environmental Management

The soils of Azerbaijan, the Caspian Sea and main rivers, as well as the atmosphere of the major industrial centers in Baku and Sumgayit are among the most polluted areas in the country. This ecological situation is mainly the result of dangerous environmental policies during the Soviet regime and, to a significant extent, due to the lack of adequate State policy on the protection of natural resources.

At present, new methods and technologies, including ICT, are being widely applied to deal with these ecological problems. New methods, such as automatic gas analyzers are being introduced, which make it possible to receive continuous analyses of air pollution and determine the maximum permissible concentrations of compounds, which may go undetected during periodical air sampling. Application of gas analyzers based on the use of absorption-spectral, flare-ionizing, hemi-luminescent, fluorescent, radiometric, gravitation, electro-chemical and other methods of analysis, enables the gathering of the most reliable data and the highest possible sensitivity and selectivity. Information obtained from stationary placed gas analyzers passes through automatic telephone network channels to a Collection Center where it is entered into an indication board and then processed via a special program. In such a manner, gas analyzers placed in individual locations of the region and united into a single network, provide the opportunity to describe the state of the atmosphere, on both local and regional scales. Global monitoring of air is being carried out primarily through sampling of the atmosphere, for which there are being applied optical and radio location devices, which identify pollution at various atmospheric altitudes.

In Azerbaijan, assessment of the quality of surface and ground waters, as well as the compositions of industrial and domestic sewage, is based on information collected by routine and special observations. Observations are carried out by stationary and mobile laboratories, equipped with routine devices for chemical and physical analyses, as well as by universal devices, such as chromatographs. Recently, automatic multi-component analyzers were introduced, which make it possible to define a wide spectrum of chemical substances. Installation of these devices in many locations will give the opportunity to unite them into a single network, and obtain quantitative and qualitative data on the state of water in each particular natural water body, region and the whole country. This is particularly important, as 75 percent of the surface waters of the Kur and Araz rivers originate outside the borders of Azerbaijan, and flow into the country in a very polluted state.

Modern methods of remote analysis are being widely used along with routine ones for studying processes at sea. These systems mentioned above and the methods of environmental monitoring contribute to the accumulation and analysis of information about the state of the natural environment. Data obtained with the use of these methods are being used to model the natural processes and set up scientifically sound forecasts, which serve as a basis for practical recommendations aimed at improving environmental protection.

Analysis of the accumulated information is carried out with the use of modern techniques of database management. Monitoring of the state of the environment takes place in real time-regime for processing and transition of data from stationary and mobile observation posts, applied packages of programs for making forecasts and identification of air venting.

Production activity is associated not only with air emissions and industrial/domestic discharges, but also with unused technological waste of industrial enterprises, agriculture facilities and municipal economy. Annually, an estimated 5 million cubic meters of solid domestic waste (SDW) are generated in cities and other settlements in Azerbaijan. The largest part of this waste is delivered to landfills/ polygons (there are more than 80 unorganized polygons in Baku alone and about 200 throughout the country). However, only 1 percent of the waste is processed by industrial methods. Currently only one experimental scrap processing plant with the capacity of 65,000 tons of SDW per year is operational.

The Ministry of Ecology and Natural Resources, jointly with other branches of the Executive power, has been conducting wide-scale preparatory works to utilize the SDW. Criteria are being developed for choosing a technique and placing facilities in various regions, in reference to the type and class of SDW toxicity. The choice will be based on technological principles, incorporating mechanical, chemical, physical-chemical, thermal and biological techniques, and in line with the final goal of liquidation or utilization of the SDW.

Currently, it is the responsibility of the Ministry of Ecology and Natural Resources (ECO.gov.az) to bear the functions of developing and implementing the State Policy in the field of study, reproduction, use and protection of natural resources, and in providing environmental safety. In this Ministry, an Information Archival Fund has been established to accumulate all data from monitors related to both the qualitative and quantitative

meteorological and physical parameters from automatic devices, for measurement of emissions carried out with the automatic devices, designed for background measurements, and mobile laboratories. The Information Base will also include data on water, subsoil, forests, flora, fauna, specially protected areas, and many other concerns.

The Ministry's policy in this field involves the following: (1) raising awareness on environmental activity through building an ecological information system with the use of modern automated equipment, aerospace control systems and ecological mapping; (2) stimulation of the introduction of new low waste, resource effective and clean technologies; (3) introduction of biotechnologies in environmental protection; (4) applications of alternative energy sources; (5) wide introduction of international strategies in nature conservation and (6) means for building and managing the natural technical geosystem that would provide for their operation with no disturbance for the mechanisms of self-regulation and natural balance of life-support systems of the biosphere. The activity of the State Land and Cartography Committee on lands assessment and mapping has been based on the modern technologies including ICT and remote sensing from space.

2.4. Spread and Quality of ICT Access in Azerbaijan in the Focus of Regional Situation

Lack of reliable regional statistics prevents the country from having a complete picture of the readiness of specific regions in Azerbaijan for wide-range usage of ICT. However, results of a survey carried out during August and September 2003 in seven regions of the country-Ganja, Mingachevir, Alibayramli, Shaki, Guba, Lankaran, Barda, Nachichevan and Baku partially provides the necessary data.

The main ICT equipment are concentrated mostly in Baku. The survey clarified the differences between the capital and the regions, both in relationship to the steps needed for readiness of for the spread of ICT and in observed problems. The differences in spread and quality of ICT are explained by differences in business development, level of employment and income per capita. According to data from the State Statistics Committee, four Internet hosts are available for every 1,000 people. But according to this survey, only 0.15 Internet hosts are available for each 1,000 people in the regions outside of Baku. This would indicate considerable lag in the outlying regions of the country as compared to the capital in terms of Internet access.

There are also considerable differences between Baku and regions of the country in distribution and access to ICT in such fields as education, public health, entrepreneurship and social welfare.

2.4.1. Public ICT Access

Internet Clubs and Resource Centers are the main points of public ICT access in Azerbaijan today. The number of these establishments has been increasing both in the capital and in regions because the majority of people do not own personal computers. So, while experts claim that there are 7.5 Internet Clubs per 10,000 population in Baku, only 0.8 Internet Clubs are available in the countryside for the same ratio. Resource Centers, playing an important role in provision of the population with ICT access, have been created through the assistance of various international organizations in Baku.

According to this survey, Internet Clubs and Resource Centers in Baku and the regions are equipped with new generation computers (Pentium, Celeron) and have access to the Internet. In 30 Internet Clubs in the seven regions, there were 215 computers. On average, there were seven computers per Internet Club. The majority part of these computers (72 percent) had CD drives. Each of the Internet Clubs had an internal local network, ink and laser jet printers. Only six clubs were equipped with scanners. The cost of services, delivered by Internet clubs both in Baku and the regions, is between 2,000-3,000 manats per hour.

Communication lines are poor in the regions. As a result, IPS Bakinternet, monopolizes the Internet market in those regions. The fact that price rates for Internet services in both the regions and the capital are nearly the same is explained by this fact.

Resource Centers, created through the assistance of such organizations as UNHCR, Eurasia Foundation, IREX, Oxfam as well as some embassies are playing an important role in the spread of ICT. The National Forum of NGOs and the Ministry of Youth, Sport and Tourism have also rendered their active assistance in the creation of these centers. There were 69 last generation computers in 17 resources centers situated in regions under survey. All computers were equipped with CD drivers. All Centers had Internet access and printers, primarily laser jet. Only four centers had scanners. These Resource Centers provide services in teaching English, computer literacy, and the use of the Internet.

The greatest percent of users turned out to be male (74 percent). The majority (71 percent) were under the age of 22. The fact that there are more users under age 15 in Baku than in the regions should be noted.

The results of the survey indicates that Internet Club users in Baku and the regions have different goals. In most cases, these differences can be explained by the fact that since greater opportunities are available at work and other institutions in Baku, this eliminates the need for users to use the facilities of Internet Clubs and Resource Centers. The fact that Baku youth under the age of 15 are among the greatest number of users support this claim. They frequent Internet Club to send e-mails (50.7 percent), play computer games (44.8 percent) and chat (37.6 percent). But in the regions, Internet Clubs are practically the only place to access the Internet, and the majority of visitors prefer to carry out scientific research (85 percent), type texts (72.9 percent) and send e-mail 60.8 percent. The fact that the majority of user responders (76.4 percent) began visiting Internet clubs only this past year indicates the dynamic growth in this field. Only 6.8 percent of responders said they had been using Internet Club services for more than two years. There are not many differences between Baku and the regions in this respect.

Both in Baku and the regions, the survey indicates that the majority (90.3 percent) of responders visit Internet Clubs and Resource Centers at least two to three times per week. Some 35.7 percent use these services every day.

The difference in incomes of the population in Baku compared to the regions explains the differences in how long people have been using the Internet service. The majority of users who responded (60.9 percent) in Baku and the regions spend one to two hours in Internet Clubs and Resource Centers. However, the rural population makes up the majority (76.6 percent) who use these services for less than one hour.

The level of computer literacy among the majority of users still remains low. The majority of responders in Baku and regions (92.5 percent) had never passed a test to determine their computer literacy. In fact, there were no differences between Baku and rural areas in this regard. However, it should be noted that 49.3 percent of the responders had attended computer courses. More than a half of them (54.1 percent) had attended private courses, and 22.2 percent had attended courses organized through the assistance of international organizations. Among those who had attended courses, the rural population made up the majority (65.3 percent). International organizations play an important role in the spread of computer technologies in regions. According to the survey, among those who attended computer courses organized through the assistance of international organizations, 81.3 percent are from rural Azerbaijan. The rural population comprised the majority of those who have attended free computers courses.

At the same time, the survey clarified some of the problems connected with the level of knowledge, obtained from these courses. They do not use result testing after the course is over. In the majority of these courses, they study only simple basic computer skills. The same holds true for courses which students pay for; and instruction is fairly special. Perhaps this can be explained by the low price for these courses. Though the level of teaching at computer courses seems to be the same throughout the country, the prices range from $10 to $16 per month: 23.6 percent of students paid $10 a month, 25.8 percent paid between $10 and $16, and 18.7 percent paid more than $16.

2.4.2. Education

The results of the survey show that the majority of schools are not equipped with computers and other means necessary for ICT introduction. The survey shows that only 16 percent of schools have computers in those seven regions of the country and only 30 percent of them were equipped with modern generation computers (7 percent with Pentium and Celeron).

In Baku, only 22 percent of computers in schools are using modern generation computers. According to data from the survey, there is one computer per every 164 school children in Baku, and 1 per 230 school children in regions.

These results contradict data published earlier as a result of a survey undertaken for the international organization (Statistic Report of UNESCO, Towards a Knowledge-Based Economy. Azerbaijan Country Assesment Report. 2003). According to this data, there was one computer per 30 school children. This would mean that every classroom in the country was equipped with a computer, which is far from the reality.

Access to the Internet as well as to the development of such up-to-date methods of education as interactive and distance learning is quite limited. The survey indicates that in schools equipped with early generation computers, the equipment is used as an auxiliary means only to teach computers skills.

Another negative feature was the low level of school teachers' knowledge of computer technologies and skills to use computers both in Baku and throughout the regions. As a consequence, there is low productivity of the educational process and weak motivation

among schoolchildren to understand the importance of computer technologies for the development of their intellectual potential.

2.4.3. Public Health

Public health institutions are not sufficiently equipped with computers nor do they have access to the Internet. Only 13 percent of health establishments in these seven regions have computers. Only two regional hospitals have Internet access. Thus, a considerable difference is observed between Baku and the regions.

Therefore, if, on average there is only one computer per every 50 health personnel in Baku, that ratio is one to 96 in the regions.

The differences can be detected in how computers are used as well. In the regions, they are being used primarily as office typewriters. Only in 21 percent of the health establishments were computers being used for diagnostics. In Baku, 83 percent of health institutions that were surveyed use computers for diagnostics.

Box 2.3. ICT in Public Health

According to the results of the survey, each hospital had, on average, five computers. However, only 17 percent of the hospitals had access to Internet. In 83.3 percent of the hospitals, computers were used for diagnostic purposes, 16.6 percent used them for professional correspondence, and 91 percent for office work, such as typing. According to the survey, on average, only one computer was available per 50 medical staff in Baku.

Profile Analytical Unit, 2003

2.4.4. Social Security

The situation regarding social security or social provision and ICT differs from other fields. In all offices of Ministry of Labor and Social Protection in surveyed regions, modern generation computers had been installed. Due to pension reforms carried out via the support of the World Bank, the work on a database has been started. On average, each of these organizations has three computers, mainly Pentium. Some 62 percent of these offices have Internet access. These computers are being used primarily for office needs and typing. There are no local networks in these offices; however, local network projects that will unite them into a general network are being planned for the future.

2.4.5. Entrepreneurship

A survey of private companies indicated that the development of ICT was minimal. Each private company that was surveyed had on average only 1.6 computers. Only 1/3 of these companies had access to the Internet and only 25 percent had an internal local network. Basically, computers were being used for office needs and typing. Obviously, usage was not sufficient. In addition, except for Resource Centers, created with the support of international organizations, these small businesses are using non-certified soft-ware because of a lack of funds.

2.5.Information Technologies, Modern Technologies and MDGs

Access to information at reasonable rates will support technologically equipped production processes. This, in turn, will have a positive influence on the job market by increasing the number of jobs and income.

This will be of great importance for the scientific and technological market, because of an increase in demand for these services, with a subsequent positive influence on the development of research and incomes of intellectuals. Studies have shown the expanded involvement of citizens in the field of intellectual labor reflects on the qualitative indices of education. Civil society's efforts in such strategic steps, which should be backed by the government, will promote various aspects of the MDGs. The government's ability to support these processes with State funds will increase, as poverty is reduced. Information technologies that are involved in these processes will ensure wide participation of the population's awareness of achievements of the MDGs, aimed at the improvement of the wealth of citizens of Azerbaijan.

Availability of information resources will promote the achievement of MDGs on such issues as the struggle against poverty, gender and regional disparities. The social factor, which is inclusive of a wide spectrum of problems, is, to the same extent, important for the focus of quality of access to information and communication services. Today Internet, like cable telephone, should be made available to the widest possible circle of users, distributed across the entire range of social and age groups.

Regional differences can be also considered one of the key factors affecting the quality of access to ICT services, as it is apparent that the distribution of computers, as well as the

development of ISP in Azerbaijan's regions, is occurring at a much slower pace than in Baku. Gender imbalance is also among the factors that influence the level of accessibility to ICT services. Various surveys show that women in Azerbaijan are much less engaged in policy, economic life and decision-making than men. In addition, despite the fact that there are more women in the population, the number of females studying at secondary and higher educational institutes which specialize in ICT Science is less than that of men, and this creates a gender imbalance.

Increasing the level of education is one of the key issues of the Millennium Goals. Distance Learning, which expands opportunities for getting an education for various sectors of the population, is of particular importance. The development of telecommunication systems, which ensures access to remote catalogues, files and e-libraries, user files, databases and knowledge bases, can also be used to conduct virtual lectures, workshops and conferences. These systems facilitate the coordination and cooperation of works on scientific topics and the establishment of global corporate working groups. Distance Learning can be one of the measures employed to expand access to education and scientific achievements.

Important elements of the MDGs, such as the reduction of infant and maternity mortality rate, stopping the spread of HIV/AIDS, malaria and tuberculosis could be facilitated through the provision of medical assistance via Internet. One of the main benefits would be to provide more access to the high quality and specialized research of leading medical centers in more remote regions and to substantially reduce the amount of time and related costs in treatment. The continued training of physicians in remote areas through regular consultation would be another critical advantage.

Achieving social justice by providing equal access to information is an inseparable component of Human Development and of the Millennium Goals for reducing poverty. Therefore, it is one of the priorities of State Policy.

Usage of ICT in Public Health obviously requires serious attention. The majority of hospitals and clinics document the progression of a disease by traditional methods. Computer databases have not been developed in all of these clinics, medical personnel in many hospitals are not aware of computer technologies for diagnosis and treatment of patients. The absence of inter-hospital networks diminishes the number of consultations between physicians of various clinics, which have no opportunity to use this means of communication as do their colleagues in Baku and other centers.

2.6. Conclusion

Since gaining independence, the process prepare Azerbaijan to becoming an Information Society have accelerated. The main prerequisite for Azerbaijan's transition to an Information Society is its human capital, which in the face of high professionals possesses enough potential for taking part in the process of development of information technologies and other high technologies. Intellectuals will be more readily supported by educated citizens, skilled in many fields of science and technology.

The country's rich natural resources and geopolitical location as a crossroads of future international trade links promote the creation of information technologies. One of the peculiarities of the current situation is that the development of an information infrastructure began earlier than economic growth did. This helped to foster foreign investments in the country and as promoted the development of economic growth.

The most important achievements in building the bases of an information society include:

- Development of cable dial-up telephone lines;
- Expansion of satellite link channels;
- Launch of modern main links, such as fiber optic communication;
- Rapid development of cellular link communication and Internet with a total of 800,000 mobile phone clients, 80 percent of the country's territory being covered by cellular services, and 240,000 Internet users;
- Computerization of working positions at executive power bodies, especially at tax and customs agencies, financial market agencies (banks and exchanges), computerization at educational and medical institutions in the country is relatively developed;
- The social investment programs of international oil companies have supported the distribution of ICT and other modern technologies throughout the country; However, analysis of the usage of ICT has shown that despite achievements in

creating a basis for an Information Society, there are problems that limit accelerated progress:

- The existing information infrastructure may face stagnation if demand in its services is not stimulated. In this respect, the information market is anticipating the development of non-oil sectors of the economy. The rapidly developing oil sector provides adequate demand for the further development of the communications sector.

- A strategy in the field of provision of compatibility of information and communication technologies, which could be applied to the developing sector of Azerbaijan's ICT, has not yet been insufficiently outlined.

- The monopolistic stance of the relevant State Institutions and both its formal and informal interference with the business of private operators is negatively affecting the development of the information communication market and progress in relevant technologies. One of the negatives of the Institution's monopoly is its tariff policy in regard to intercity and international trunk call lines, tariffs for channels linking the Internet and access to satellite communications channels. Such a policy is one of the major reasons that many potential users do not have access to Internet.

- The problem of low population income negatively affects progress of the telecommunications market. To a certain extent, this is the result of institutional and structural reforms not yet being fully implemented.

- Elimination of obstacles in ICT development is the declared priority of Azerbaijan's State Policy for the next 10 years. This follows from the President's Decree concerning the formation and development of Information Society to facilitate sustainable human development. To accomplish these goals, the following urgent and necessary policy recommendations and steps should be made:

- Development and programming of the State Strategy in the field of modern and high technologies implementation, similar to the ICT strategy;

- The adopted NICTS extends over a relatively significant period of time, from 2003 to 2012. This requires regular initiatives directed at monitoring and regulation of the information and communication technologies being launched to ensure their compatibility. This can be ensured through the development of middleterm state program for ICT development;

- Development of communication lines in rural areas should attract special attention of the government, taking into account the political goals connected with the State Poverty Reduction Program and development of entrepreneurship in the regions;

- Acceleration of institutional and structural reforms for further improvement of the business environment, attraction of investments to the non-oil sectors, as well as to scholar-technological developments;

- The quickest possible de-monopolization of the ICT sector through privatization of the Ministry of Communications' commercial structures.

- Ongoing reforms in the health system should expand the use of ICT so that the quality of health care will be improved and so that there will be fewer disparities in treatment between the various regions.

MODERN TECHNOLOGIES AND FORMATION OF HUMAN GOLD

Chapter 3

3.1 Introduction

Knowledge is the main factor in human development. The use of modern technologies, including ICT for transfer of knowledge and information is determined in the MDGs as a means towards equality and development at a national and global level. Azerbaijan possesses rich natural resources with oil and gas occupying an exceptional position. In Azerbaijan's most recent history, the non-renewable natural resource black gold is an invaluable means for progress in the economy and development of the potential of inexhaustible capital, - human gold.
The industrial development of Azerbaijan's oil began more than 100 years ago. Since then, more than 1 billion tons of oil have been extracted. Despite this, the wells still contain

reserves, which exceed this amount several times. Many achievements of the country relate to the development of the oil industry, which has influenced the formation of economic and human potential by the development of science and engineering, and various industrial and agricultural sectors. The economic opportunities provided by the oil industry also influenced the development of culture and arts. The Oil Boom of the late 19th century and beginning of the 20th century brought about significant immigration to Azerbaijan, which also promoted the development of human potential in the country and formation of a multicultural social environment.

Since regaining its independence in 1991, Azerbaijan has had the chance to use its natural resources to a greater extent for its own national interests. One of priorities of the UNDP is to promote projects and activities that transform black gold into human gold. The formation of human gold is understood as a process of human capital development not only for the development of economic opportunities of energy branches, but also in respect to the transfer of modern technologies in the field of production, planning and management.

The formation of human gold in acquiring the most recent knowledge and tech-nologies represents an important condition of human development. Currently, oil projects exist which will result in economic growth, the development of modern technologies, and the mobilization of knowledge for the exploration and use of renewable natural sources. An important aspect of human capital formation is also an increase of economic opportunities for the improvement of issues related to human development, such as personal income of the population, improvement of health and longevity indicators.

This chapter discusses the state of ICT use in education, as well as the use of economic and technological opportunities, provided by the country's energy branch for the formation of human capital and provision of the process of steady development of the country.

3.2. ICT in Education

3.2.1 ICT in Schools

Government statistics have not been gathered to determine the level of computerization in Azerbaijan's education system. The percentage of schoolteachers, who have passed courses of computer literacy (among secondary school teachers) is 15 percent.

Out of the teachers of information techno-logies, only 70 percent know how to use Word processors and text editors, accor-ding to the Main Indices of ICT Ap-plication in Secondary Education in the CIS and Baltic States, a statistical report of UNESCO Institute for Information Technologies in Education (2002). The financing of education by the State today is too low to computerize all schools. However, some schools acquire computer equipment and teacher training through various international projects and some schools receive support from oil companies operating in Azerbaijan.

In the development and spread of modern ICT, a significant role has been carried out by various international institutes. In 2002, under the World Bank's first allocation of $5 million, 20 schools in Azerbaijan's five largest cities were provided with modern computer classes. The World Bank's se-cond allocation is expected to increase this amount to $14 million for a period that extends to 2010.

The international NGO Project Harmony is carrying out a project to link schools to PC classes, an experimental program designated to network 10 schools in Azerbaijan and conduct training for teachers. The project's goals are to establish a dialogue network of teachers and develop relationships with schools in the U.S. and other countries. The U.S. organization Junior Achievement coope-rates with the Ministry of Education in Applied Economics in 20 secondary schools in Baku. Each school involved in the program received a computer.

The Open Society Institute-Azerbaijan (OSI) has done a significant job in secondary schools to expand ICT in primary-level education. OSI is launching the project “I*Earn” (IEARN.org) in Azerbaijan. The program has supplied nine schools in Baku and two schools in Sumgayit with computers (one computer per school). In connection with the Azeri-Chirag-Gunashli Project (ACG) of the Sangachal Terminal Expansion Program, which BP and its partners are carrying out, schools in the Garadagh District are conducting computer literacy courses, for which the required equipment and special training has been provided. Simultaneously, the Hu-man Development Center of the ACG Project has trained more than 500 people from local communities.

Along with the use of data from the Azerbaijan Development Gateway e-Readiness Assessment Report-2001, the National Information Communication Technologies Strategy (2003) and inter-national statistical data, other studies to determine the actual supply of computers in secondary schools have been carried out. A survey, Diffusion and Quality of ICT

in Azerbaijan with Focus on the Regional Situation-2003, indicates that definite steps related to the introduction of com-puters in school education have been taken. Nevertheless, there are not enough computers and related equipment in the country to link schools with universities and research institutions.

Actual information and detailed statistics are necessary so that adequate decisions can be made for the development of ICT in schools. Work in this direction is currently being done. Surveys within the framework of NHDR-2003 point out the necessity of data correction on the existence of computers and computer classrooms in schools, taking into account the considerable number of computers that were registered and installed back during the Soviet times before models using current systems such as Windows and other software appeared on the market.

3.2.2. ICT and Higher Education

As in secondary schools, the State sector's higher education's computerization is occurring primarily with support from international organizations, including NGO foundations, and foreign oil companies. For instance, Exxon, in collaboration with OSI-Azerbaijan and the U.S. Department of State has provided computers to the State Oil Academy to develop one of its computer labs.

The majority of students have access to computers at universities. Computers are being used largely for working with texts, but there are more and more students who are beginning to exploit the potential ICTs available on a very professional basis. However, the studies indicate that there is a great disparity in how literate students are in using relatively current computer software.

The use of ICT in education is steadily growing. Studies have shown that many educational and research centers use ICT not only for education and research but also for management. Private universities are more flexible in ICT development.

University Websites offer information on academic faculties and centers, services, news bulletins, contact information and staff. They also provide online appli-cations. Some private universities, such as Western University and Khazar, include some interactive features on their Web sites.

Caucasus University is working to create the development of a wireless connection among 11 secondary schools.

Some teachers are developing several Distance Learning courses for Guba, Ali Bayramli and Nakhchivan.

Box 3.4. International Organizations Promote Computerization of Universities

The State University of Baku (which has 300 computers for its 14,000 students) with the support from OSI-Azerbaijan and IREX/IATP has created a Resource Center to increase the ICT development in education. University teachers and secondary school teachers are trained in Basic Computer and Internet skills. They, in turn, train others.

Azerbaijan International University has more than 400 computers for its 6,000 students.

The Open Society Institute Azerbaijan, in cooperation with IREX/IATP and Exxon has created five Resource Internet Centers in Baku: (1) State University of Baku, (2) Medical University, (3) Western University (4) Technical University and (5) Khazar University. They also continue this work with universities in four other provinces: Nakhchivan, Mingachevir, Ganja and Lankaran.

Western University has been cooperating with universities in the U.S., and has created and operates modern ICT offices for widespread educational purposes, information provision and scientific and educational links.

In 2001, the Azerbaijan State Economic University was the first to establish an “Upgrade of Qualification and Re-Qualification Skills” as Distance Learning. There are currently 50 students enrolled.

Khazar University, in cooperation with Western University and IREX, introduced an International Negotiations Distance Learning course in Fall 2001.

3.3. ICT and Expansion of Access to Education

Access to ICTs in education is an important indicator of a country's progress in building a civil society. Creation of equal opportunities for all citizens, irrespective of their social status and financial opportunity, is a prerequisite for successful implementation of democratic reforms. Azerbaijan was the first republic of the former Soviet Union to make the political decision in 1992 to conduct common entrance examinations for universities and secondary specialized educational institutions on the basis of a single test exam. The State Commission for Students Admission (SCSA) was created to organize and conduct these exams. Since 1992, SCSA has been developing, organizing and conducting all entrance tests for higher and secondary specialized educational institutions in the country and has gained 10 years of experience in introducing information technologies into the education process. Since 2001, by Presidential Decree, SCSA has been testing the professional knowledge and skills of governmental employees' prior to employing them for particular positions.

The SCSA assesses the level of knowledge of applicants for university education on the basis of standards developed within the programs and courses for the secondary schools.

The entire process of entrance examinations, that is, designing the optical forms used for the tests; developing the national standards for assessment of the level of knowledge of university applicants; creating and regulating the database of university applicants, personnel, experts, educational institutions; selecting and training the personnel engaged in the process of testing; and informing every applicant about his/her results and every institution about the list of its prospective students; statistical analysis of results and recommendations on further development of the process. All these stages have been designed as an open social-technical system with fully automated technological procedures.

The main component of entrance exams with the application of modern technologies is that these technologies allow assessment not only of the knowledge of applicants within a short-term test through distributing them by specialties, but also the general level of education nationwide and in individual provinces, cities/villages, schools, and subjects. Using IT makes it possible to save time and human resources and eliminate subjectivism during the tests.

Since 1999, SCSA has its own Web site (TQTK.gov.az), which provides information services prior to, as well as after, the exams. Any university applicant can take a virtual exam, and compare his/her personal knowledge with that of other participants on this test.

The introduction of information technologies ensures the following:

- Transparency of the testing process;
- Acceleration of the processing of results;
- Exclusion of subjectivism in assessing knowledge;
- Equal access to education by various groups of the community;
- Reduction of human and financial resources allocated by the government for the process of testing;
- Increase of motivation of the educational process.

Box 3.5. Students and the Testing System (Excerpt from Report “Sociological Survey of the First Year Students at Higher Educational Establishments in Azerbaijan”)

With answers being evenly distributed on a question about attitudes towards the test system, more than 70 percent of the students whose parents were unskilled laborers and agriculture workers believed that the test system reflected their level of knowledge to the largest possible extent. This fact once again confirms the belief that the test system creates equal conditions for all university applicants, irrespective of social status. Therefore, a significant number of students from poor families prefer the test system compared to students from other social groups.

3.4. Oil and the Formation of Human Gold

Azerbaijan's oil has always been the most important factor of development of the country and of the foundation of its human capital. Oil industry in Azerbaijan, which yielded more than half of the worldwide oil production in the beginning of the 20th century, began its history with wells of only a few dozen meters in depth. The start of the Industrial Revolution in Europe and later in the Russian Empire, of which Azerbaijan was a part of after 1828, called for the increasing demand of oil. In the early 20th century, Azerbaijan's oil extraction had already reached 10 million tons per year.

Oil extraction stimulated the development of relevant technologies for oil refining and transportation. Azerbaijan became the first country in the world where hydrocarbons were delivered via pipelines, a method, that not only was more economic, but also ecologically less damaging.

Developing the oil industry required an appropriate development of the financial market, the transport infrastructure and other kinds of infrastructure. In addition, the history of Azerbaijan's oil industry is inseparably related to the development of sciences and technologies. Azerbaijani specialists were the first in the world to succeed with offshore oil extraction with Neft Dashlari (Oil Rocks).

The development of the oil sector not only ensured employment with highly paid jobs, but it demanded further scholar and technological innovations, and strengthened the entire national economy and social infrastructure. This was carried out by direct allocations from the budgets of oil-extracting enterprises as well as by allocations from the State budget, in which the share of revenue of oil sector was always significant. Consequently, investments could be made in the development of other industrial branches, such as the economic and social infrastructure.

The demand for machinery and technology stimulated the machine-building industry, which developed a special segment oriented towards the demands in oilfield equipment. Development of this sector also stimulated research related to geophysical methods of oil exploration and the design and creation of appropriate tools and technologies. Research and development of chemical technologies and the petrochemical industry also relate directly to the oil sector. In 1949, a new city appeared on Azerbaijan's map, Sumgayit, which became the center of Azerbaijan's petrochemical industry. The shift toward offshore oil extraction demanded modern technologies, including ICT.

Azerbaijan's deepwater offshore fields, which are considered one of the most prospective fields in the world (in terms of number of undeveloped fields) can only be accessed with the use of the latest state-of-the-art technologies. Mobilization of modern technologies is an important factor in the formation of human capital, which impacts essentially on human development and the formation of human gold. The intensive development of the oil industry and other related sectors of the economy promoted the formation of human capital. The high professional level and qualification of the Azerbaijani specialists facilitated their involvement in oil exploration and exploitation in various countries and continents.

The new birth of the oil industry began when Azerbaijan regained its in-dependence and became an independent nation, subject to the international economic community. Foreign investors came to Azerbaijan again, and the first object of their attention was oil and gas. In 1994, the Azeri-Chirag-Gunashli (ACG) Production Sharing Agreement (PSA) was concluded, followed by more than 20 other contracts in the oil and gas sector alone.

It is expected that by 2010 Azerbaijan will again take its place as one of the largest oil suppliers for international markets. Oil reserves of the ACG have been reassessed from the initial amount of 511 million tons and are currently estimated at 753 million tons, according to SOCAR. Another large multinational project - Shah Deniz - will transform Azerbaijan from a natural gas importing country to a gas exporting country. With the beginning of implementation of the Full Scale Development of the Azeri field and the gas project Shah Deniz, Azerbaijan together with the other shareholders of the projects, started constructing the oil export pipeline Baku-Tbilisi-Ceyhan (BTC) and the gas export pipeline Baku-Tbilisi-Erzerum in 2003. These projects, valued at a total of around $6 billion, with involvement of both foreign and local contractors, as well as professionals and workers with various specialties and skills.

Investors and owners of the BTC pipeline intend to carry out this project in line with the highest international standards and requirements in terms of technologies and environmental impact. The BTC project will accelerate economic development and welfare in the participating countries (Azerbaijan, Georgia and Turkey) and will become the key component of the East-West energy corridor.

The oil sector provides about 1.0 percent of the employment market. The main potential of the sector to influence the development of human resources in Azerbaijan must be displayed through a multiplier effect of financial flux to the country for development of other economic branches and employment rates, in the field of both the production of goods and the development of sciences and technologies.

The goals of the country's economic development in this context cannot be limited solely to the restoration of a diversified profile of a national economy, similar to the one established in the Soviet period, which was destroyed with the collapse of that political-economic regime. In this context, it seems important to use the potential of the oil sector, which is currently developing rapidly under the influence of contracts with multinational oil companies, for achieving qualitatively new diversification for economic profile and human development in

Azerbaijan. This means that along with the rehabilitation of traditional economic production and human activity, new production enterprises, reflecting the demands of the coming epoch of information society, should be created. In terms of the impact on human development, this means involvement of people in new, unconventional spheres of employment. The high level of education of the population and the accumulated skills in the traditional forms of activity contain a huge potential for achievement of this goal in Azerbaijan. This will be promoted by such measures of the government as the adopted spread and NICTs.

Despite notable successes in individual sectors since the restart of economic growth in 1996, optimism can be expressed only in some production areas in industry and agriculture. The oil sector currently produces around 90 percent of the country's export revenues, and the country's positive trade balance is due largely to international oil prices. The government has developed special programs aimed at the development of the non-oil sector to diminish regional disparities in economic development.

The solution to this situation is for the government to focus its attention so as to achieve multiple benefits from the development and financial flux of the oil sector and, from this perspective, to strengthen the profile of national human development In such case, this effect will manifest itself in the diversity of human activities for sustainable development, by reducing the risk of "brain drain" and "geen drain" associated with the lack of fields for intellectuals to get involved in and, finally, by accumulating material, as well as intellectual wealth for further progress.

Despite the remaining problems, these processes, stimulated by the im-plementation of oil projects, are already developing in the country. This is manifested, in particular, by the increase of enrollment of students in high schools over the recent years, as well as the enrollment ratio for all three levels of education. Strengthening reasons for getting an education should be a high priority. Oil companies are promoting the development of human gold either through humanitarian involvement or by pursuing policies in the fields of employment, education and upgrading skills, which are associated with the terms and commitments under the concluded oil agreements.

Implementation of oil projects influence the human development process in the country by increasing the education component due to improvement of knowledge and skills of local people engaged in these activities and the increase of their incomes. An illustration of this is the policy, which BP and its partners have been pursuing toward a permanent increase of the percentage being hired local employees.

The increase of the economic component of human development in the country will also occur, at least to a certain extent, due to the expected increase in the share of national suppliers for the oil projects. In addition to the positive economic effect, this policy will also promote the upgrading of the technical and technological level of domestic goods and services to be supplied, bringing them in line with international standards. This, in turn, will contribute to the increase of overall competitiveness of the national economy.

Various international oil companies are supporting the government's effort to defeat poverty and to increase the potential of development of human gold. Since the commencement of their operation in Azerbaijan, they have taken part in many humanitarian, educational and cultural projects. Examples include projects related to health, education, immunization, orphanages and schools, as well as funding cultural programs and competitions among children.

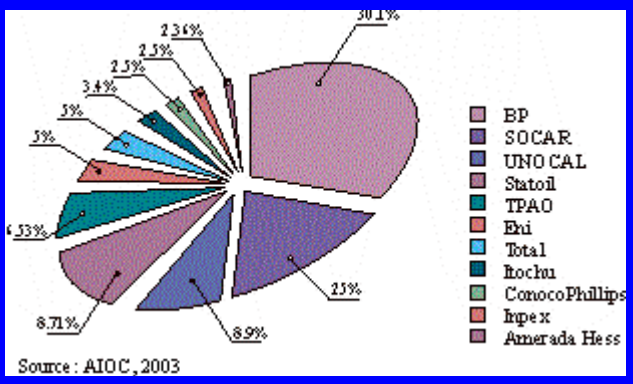
In Azerbaijan, there are about 10 higher-level schools that train students in natural sciences and technologies. The Azerbaijan State Oil Academy (ASOA) established in 1920 occupies an exceptional position among them. An overwhelming majority of the currently operational institutes oriented toward natural subjects were formed as independent educational establishments that were based on individual departments at ASOA. ASOA graduates not only work in oil sector enterprises, but also train people in other institutes and research labs, both inside and outside of the country. Since 1920, ASOA has educated more than 70,000 students. This number includes around 3,400 specialists from 68 countries who received their education at ASOA between 1964 and 2002.

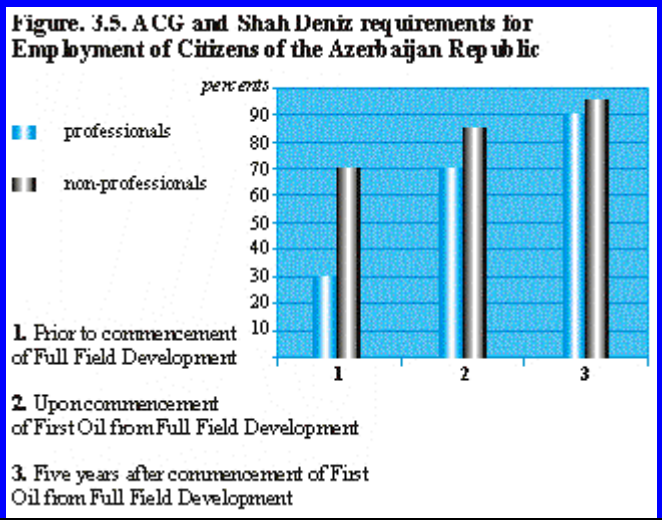
In 2001, the Oil Production Sharing Agreements (PSAs) and revenues earned from them led to the establishment of the State Oil Fund of Azerbaijan Republic (SOFAR). The Oil Fund is based on funds that have already been received, or will be received, from the PSAs. This fund is destined to play a significant role in human development in Azerbaijan's future. According to SOFAR management, there were assets of $723 million as of April 1, 2003. In small amounts, the Fund already provides social support to refugees and IDPs. However, this fund should be primarily used for increasing human potential by investing in the development of the fields, based on knowledge as well as on the renewal of natural resources.

Box 3.6. Basic Historical Facts of Azerbaijan's Oil Industry

1878 - Construction of the first oil pipeline in Russia Balakhani to Baku's Black City.
1881 - Transportation of crude oil and refined products by railway for the first time in the world.
1883 - Launch of a continuous refining oil unit.
1924 - Use of drilling turbine, for the first time in international practice.
1927 - Launch of automatic drilling technology.
1930 - Launch of electrical logging that allowed examination of all layers of drilled well.
1930 - First inclinometer that identified angle of well's curvature.
1949 - Beginning of offshore oil extraction (Neft Dashlari - Oil Rocks). First in the world.

Figure 3.4. Shareholders of the Baku-Tbilisi-Ceyhan Pipeline Company





3.5. Conclusion

ICTs are currently used in the education system. One of the first applications was the admission exams created for students to higher and secondary schools. Currently, this work is being carried out by the State Students' Admission Commission (SSAC). The activity of SSAC ensures transparency and fairness of entrance examinations, offering equal access to education by organizing exams and assessing knowledge.

However, the degree of ICT application is insufficient. Because of the lack of national statistics, insufficient accuracy and of some foreign sources, additional studies should be carried out.

Oil extraction and refining are traditionally leading factors in the development of Azerbaijan's economy that have greatly influenced the formation of human gold. The most active period of oil extraction took place when the country was still part of the USSR. Despite all of the negatives, which are typical for administrative command economies, Azerbaijan gained notable success in the formation of significant human potential, influencing the HDIs.

The previous period of the exploitation of oilfields was marked by the development of a relatively diversified economy and industry, growth of cities, and the development of culture, arts and sciences. The country's greatest capital and wealth is its human potential, especially related to the high level of education and variety of professional skills. To varying extents, these achievements relate to oil, the extraction and refining of which played an important role for the development of the economic and social spheres. However, this wealth could not be

used fully for the country's comprehensive development because of the economic and political peculiarities of the Soviet Union.
Since the collapse of the Soviet regime and transition toward development of a liberal economy, Azerbaijan now has the opportunity to distribute its black gold at its own discretion and to use it with respect to its own national interests and in close cooperation with the international community. The following successes have been achieved:

- The signing of numerous oil and gas PSAs with foreign investors;
- Foreign capital has been directed into the country for the development of oil projects, which contributes to current economic growth;
- The PSAs Azeri-Chirag-Gunashli and Shah Deniz are progressing towards Full Field Development and the construction of export pipelines as a result of joint efforts by the national government and foreign shareholders. Starting in 2005, this will initiate a flow of significant funds, at the expense of export revenues.

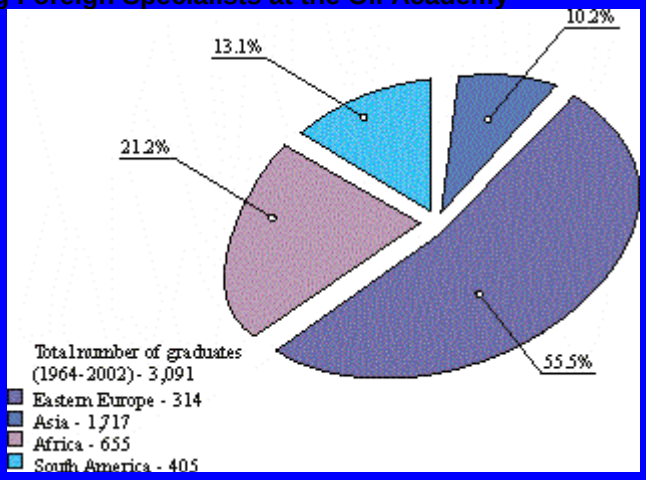
Despite success in attracting investors and improving the living standards for people, problems remain, which can negatively affect further development and sustainability of economic growth:

- Insufficient level of investments in non-oil sectors;
- Insufficient level of employment of local people;
- Insufficient level of the use of local companies and private persons as suppliers;

Solution to all these tasks requires application of various policies and approaches, including achievements and means of ICTs, primarily for the purpose of information support:

- In this direction, the government should encourage the development of conceptions and concrete projects, connected with the mobilization of renewing natural resources. In this regard, ICT could be considered as one of the resources demanding rapid transition from the import of to their export.
- To take into account the strategic aims of the MDGs and Poverty Reduction Programs, by developing high technological enterprises of machine building and hardware of ICT, food industry, pharmacology, small and medium enterprises, and competing in the creation of new products for the development of the domestic market of Azerbaijan and export to the international market.

Figure 3.6. Training Foreign Specialists at the Oil Academy



MODERN TECHNOLOGIES AND THE DEMOCRACY PROCESSES

Chapter 4

4.1. Introduction

The fact that Azerbaijan has regained its independence has opened opportunities for the country's integration into the world community and created the prerequisites for reforms in the economic, social and policy spheres. The policy, which the government has been pursuing with support of international

organizations, primarily the UNDP, has continuously promoted the increase of the human development indices. In recent years, notable successes in public participation of decision-making processes, implementation of reforms, access to information and its diffusion have been achieved.

Azerbaijan is beginning its journey towards political democracy. This is reflected by the speed and dynamics of democratic reforms in the country. The community still doesn't have a complete grasp of the political culture, rights and freedoms of citizens, and some representatives of power structures do not respect these values. In addition, restraint from violence, tolerance of individual opinions, freedom of discussion and the right to express personal opinions even though they may differ from that of the majority are new norms, which have only begun during the post-Communist era.

ICT play an important role in building up and strengthening awareness of these norms, which are among the most important prerequisites of democratic reforms. IT can create the conditions for irreversibility of the process of liberalization and the expansion of public participation in human development. The development of democratic processes requires further expansion of modern IT. This involves all aspects of democratic reforms in the country, including public awareness through mass and personalized information, along with public participation in the decision-making process.

The importance of ICT for the progress of democracy in the country and for the development of its human potential is reflected in the NICTS. This program envisages that an intensive introduction of information technologies will lead to fundamental reforms, which include involvement in political participation and fostering responsibility and transparency of the government's activity, as well as facilitating the free flow of information. In this context, the development of forms of self-organization and self-government, including NGOs, community based organizations (CBOs), professional associations and trade unions will build a favorable environment to introduce and use IT. This Chapter addresses the state and prospects of using ICT and the achievements of ICTs for further progress of democracy and expansion of public participation in decision-making, reform implementation and promoting a free flow of information.

Table 4.14 Azerbaijani Mass Media on the Internet

Newspapers	URL	Language
Ayna	AYNA.az	Azeri
Azerbaijan	AZERBAIJAN.news	Azeri
Bizim Asr	BIZIMASR.MEDIA-AZ.com	Azeri
525th Gazet	525CI.com	Azeri
Adalet	ADALET-AZ.com	Azeri
Khalg Jabhasi	XALQCEBHESI.az	Azeri
Olaylar	OLAYLAR.net	Azeri
Ses	SES-AZ.com	Azeri
Yeni Musavat	YENIMUSAVAT.com	Azeri
Zaman	ZAMAN.com.az	Azeri
Zerkalo	ZERKALO.az	Russian
Echo	ECHO-AZ.com	Russian
Baku Today	BAKUTODAY.net	English
Baku Sun	BAKUSUN.az	English

Source: Profile, 2003

4.2. Flow of Information

One of the major indicators of the democratic development in a country is the degree of freedom available to the mass media. At the moment, free mass media is one of the significant achievements of ongoing processes of democracy in Azerbaijan. In addition, active use of the Internet has considerably extended the opportunities of mass media to access and to disseminate information. Recently, the number of Azeri newspapers and magazines, which have Web sites, has significantly increased, enabling them to expand their readership. Also, ICT has ensured feedback and the opportunity for people to voice opinions on the issues being discussed, thereby influencing the formulation of topics covered by print and electronic media. According to data from the UN Global Human Development Report 2002, an

environment for free dissemination of information has been created in the country; however, this process needs to be further enhanced.

One of the forms of direct contact between the people of Azerbaijan and recognized statesmen or public figures is via Internet forums. These forums have been conducted by the Echo newspaper on its Web page. In the course of the forum, the participants voice their attitude to the guest of the forum through voting, asking questions and voicing opinions on various issues such as the economy, policy and culture. Participants of such forums are not only the citizens who live within the country but may also be those living abroad as well as foreigners. Since November 2000, there have been 118 politicians, scientists, literature and arts figures as guests on these forums.

Mass media is becoming more and more confident in standing up for their rights and freedom through public self-organization and self-government. The Council for Mass Media, which was established upon the initiative of a number of journalistic organizations, should be considered an essential element towards further development of the freedom of mass media. The Council for Mass Media is a public organization, which attempts to resolve problems between specific media, the community and mass media. They try to resolve cases before the issues result in court cases, which, according to some representatives of opposition minded mass media, is being used as a tool to pressure them.

According to the new law, “On Television and Radio Broadcasting”, a National Board for Television and Radio (NBTR) has been established to control the observance of the legislative requirements for electronic media and, in particular, to issue licenses to independent television and radio companies, to conduct relevant competitions, and to provide for effective use of broadcasting channels (frequencies). The relevant Handbook envisages the constructive and impartial activity of NBTR members. This document does not permit judicial and executive power officials, or persons engaged in any other government paid job (with the exception of pedagogical and creative activity) to be a member of the NBTR. Representatives of various branches of power are prohibited from giving any instruction to NBTR members. In addition, every two years one third of the NBTR staff is to be replaced by new members through rotation. According to the Handbook, the President of the country has no right to dismiss any NBTR member from his position until his term of authority expires. However, the multi-stage procedure of formation of this body, in accordance with which nominees for the Board have to pass selection by a commission prior to being submitted for approval by President, creates, to a certain extent, bureaucratic problems for the independent members, as well as for the representatives of opposition parties from joining the Board.

Because of commitments, which Azerbaijan took when joining the Council of Europe, a public television channel must be established in the country in the near term. However, relevant laws have not yet been adopted by the country's Parliament Milli Majlis. Many experts believe that in the draft law on public television, some provisions do not correspond to European standards. For example, according to Article 13 of the proposed draft law, the Director General of the public television / radio broadcasting channel has authority to refuse political parties from disseminating electoral agitation materials if the Director General considers such production contains “information contradicting the true goals of the electoral process”.

Table 4.15 Television Channels Broadcasting in Azerbaijan

Az TV1	State-owned
Az TV2	State-owned
ANS TV	Independent
SPACE	Independent
ATV	Independent
Leader	Independent
ORT	Russia
RTR	Russia
TRT1	Turkey
STV	Turkey
D Channel	Turkey

Source : Profile , 2003

4.3. ICT and Expansion of Participation in Decision Making

For Azerbaijan, which is in the process of strengthening its democracy, the main task so far is to establish key institutes of democratic management; that is, an electoral system which guarantees free and fair elections and a system of restrictions and counterbalances based on the distribution of power with independent judicial and legislative branches. Of utmost importance is the establishment of an active civil society capable of cont-rolling the state-owned and private sectors of the economy and providing for alternative forms of participation in political life and for free and independent mass media. Using IT significantly expands opportunities for achieving progress in all these spheres.

In Azerbaijan, interactive online contacts between the government and citizens are at their very initial phase. Usually, citizens contact the government officially by telephone, in written form or directly after being invited. At the same time, the government has recently been looking into new ways to interact with citizens by using methods of electronic contact, as the Internet allows more direct contacts between citizens and government institutes and authorities.

According to data from the UNPAN E-Government-Global Survey (source: unpan.org/e-government/global-leaderstables.htm), Azerbaijan is currently No. 78 among 133 countries in terms of establishing the so-called Electronic government. Around 30 percent of ministries and governmental bodies in the country have their own official Web sites. Since 2000, the Presidential Office of Information Resources & Technologies Center has been providing services on a free-of-charge registration in the domain GOV.az for government organizations. Currently, 28 government organizations have registered for such addresses.

All of these sites contain descriptions of their missions or, at least, give general information on the responsibilities and structure of the local governmental institution. However, there is no information or working hours, definite duties of departments or responsible persons or any other such information at official sites. Some Web sites contain formats of documents and the procedure of servicing. For instance, at the site of the Ministry of Taxes, citizens may ask questions and receive answers. However, only a few agencies regularly update their Web sites.

The Milli Majlis' Information Service Department has created a Website for the National Parliament. The site reflects the structure of the Parliament, its permanent commissions, its ongoing activities, international relations, biographies of MPs and legal acts.

The Turan Information Agency, with financial support from the U.S. Democratic Commission for Small Grants, has created a special Web site MMAZERI.com that highlights the Milli Majlis' activity in English, Russian and Azeri. The site announces sessions of Parliamentary commissions, drafting and adoption of laws, as well as the official meetings and visits of Members of Parliament. The site yields a monthly review of the Parliament's activity and analyzes the adopted laws. It also contains a database that includes the majority of Laws of the Azerbaijan Republic.

In order to implement the Decree of the President of the Azerbaijan Republic “On Improving the Activity for the Application of the State Language” (June 18, 2001), the national government has undertaken measures to affirm standards for using the Azeri alphabet in computer devices. These measures provide for solutions being made for long-existing problems in this field and for building an environment for the formation and exchange of information resources in Azeri.
Dissemination of knowledge about ICTs through seminars and workshops is of great importance for strengthening their use. A number of international organizations, primarily

UNDP, provide important assistance to governmental bodies in introducing information technologies for management. On December 18, 2002, the Milli Majlis, jointly with UNDP, conducted a seminar entitled Information Communication Technologies in State Management. This seminar was held in line with the National Strategy in the field of ICT. The measures undertaken by the national government foster understanding of the importance of using of IT in the process of creating democratic and strengthening of civil society. In this regard, particular attention is being paid to: strengthening the economic, social and intellectual potential of the country through improvement of the national education system, creation and development of the market of IT and knowledge; implementation of effective, transparent and manageable state regulation and activity of local authorities; formation of a developed infrastructure in the field of information technologies; creation of a favorable environment for the provision of human rights; dissemination and use of information; creation and development of the juridical basis for information society; and the conservation of national heritage. These measures are important conditions for the formation of human gold.

Table 4:16 Web site addresses for Ministries in Azerbaijan

Ministries	Web sites	Languages
Communication	MINCOM.gov.az	Azeri
Culture	CULTURE.az	English, Russian
Customs	AZ-CUSTOMS.net	Azeri
Ecology & Resources	ECO.gov.az	Azeri, English
Economy	ECONOMY.gov.az	Azeri, English, Russian
Education	MIN.edu.az	Azeri
Health	MEDNET.az	Azeri
Labor & Social Protection	AZERIN.com/members/mlspp	Azeri
Taxes	TAXES.gov.az	Azeri
Youth, Sport & Tourism	MYS.azeri.com	English

Source : Profile, 2003

Box 4.7 Extract from the Decree of the President of the Azerbaijan Republic on the Creation of the State Automated Informative System "Elections"

With the purpose to improve the election system in the Azerbaijan Republic, provide for its compliance with modern standards, and create the environment of openness and transparency of the election process, I decree:

- To establish the State Automated Information System "Elections" in the Azerbaijan Republic;
- To propose to the Central Electoral Commission of the Azerbaijan Republic to carry out the following activity within one-month:
- To establish within the Commission an Information Center to organize the work of the System;
- To define requirements for the System and establish rules of its operation;
- To develop and implement appropriate measures jointly with relevant organizations of executive power to ensure information exchange and protection within the System;
- To authorize the Heads of Executive Power of relevant cities and provinces to provide, within a one- month period,
  an appropriate premise for every district electoral commission for placement of logistic complex of the State Automated Information System "Elections";
- To authorize the Cabinet of Ministers of the Azerbaijan Republic to ensure, within a 15-day period, issuing funds for organization of work of the State Automated Information System "Elections";

This resolution enters into force from the day of its signing
Heydar Aliyev, President of the Azerbaijan Republic
Baku, September 3, 2000

Table 4.17 Means for Access to Information at Households (Per 100 families, in units)

	Means of Access to Information	Nationwide	Cities	Villages
1	Black-and-white TV sets	45.1	29.5	65.9
2	Color TV sets	66.1	79.8	47.8
3	Satellite antennas	16.5	14.7	18.9
4	Personal computers	0.9	1.5	0.1
5	Connection to Internet	0.1	0.1	0.0

Source: Households Survey 2002 (SCS, 2003).

4.4. IT and Electoral Campaigns

Wide dissemination of IT contributes to the creation of favorable conditions for ensuring transparency of electoral processes. An Automated Information System “Elections” has been operating in Azerbaijan since November 2, 2000.

At polling stations, in accordance with the structure of the State Automated Infor-mation System, the process of voting and information transfer shall be automated at three levels:

- At the Information Center of the Central Electoral Commission;
- At the information station of the District Electoral Commission;
- At the information station of the Precinct Electoral Commission.

The Information Center “Elections” has been established under the Central Electoral Commission to organize the activity of the State Automated Information System. The Information Center is equipped with modern computing devices and telecommunications. The Center, using the State Communications System, receives information from district and precinct electoral stations. The Information Center is capable of receiving information simultaneously from 32 stations and precincts. The information, after being gathered at the Server, is then passed to a board that stands in the observation hall.

One of the most important functions of the system is to establish links between district and precinct stations and the Information Center. With the purpose of notifying the community about the data accumulated at the Center, during elections, there is a regular update at a special Internet page of the Central Electoral Commission at CEC.gov.az.

This system was used for the first time during the elections for the Parliament Milli Majlis of the Azerbaijan Republic on November 5, 2000. With the use of this system, information about the voting process and its results from all District Electoral Commissions located in indivi-dual provinces was passed on to the Center and, with the use of television transmitters, made public to international observers, mass media and the community.

In order to improve the State Automated Information System, Electronic Ballot Boxes were installed at one of the electoral stations during the Parliamentary elections on January 7, 2001. These ballot boxes were used to automate the process of voting and the counting procedure.

Introduction of new technological means and the upgrading of those electoral processes, which already exist, are expected to take place in future. Transparent ballot boxes were already used in the Presidential Elections of October 2003 to strengthen people's trust in the electoral processes. This technical innovation should reduce the level of possible violations during the voting procedure. Another innovation, which was launched in 2003, was the new requirement of putting the ballots into envelopes prior to placing them in the ballot boxes. These and other measures, which are undertaken by the national government, are designed to promote free and fair elections in Azerbaijan.

Wide use of IT during the electoral campaigns is gradually becoming the norm for the majority of political parties in the country. Many leading political organizations and individual politicians have created Web pages where visitors can become acquainted with party documents and electoral programs, ask questions and receive answers by e-mail. Hence, opportunities for direct contact between electors and nominees for Members of Parliament or the Presidency are being created. All these measures are important for eliminating violations that were recorded during previous elections at individual electoral stations by international observers and representatives of opposition parties.

In addition, according to some national and foreign experts, organizing and conducting elections at various levels requires further democratic reforms. ICT is an important tool for

both the study of the best existing practices and for the application of the most progressive technologies of organization and conduc-tion of elections.

4.5. ICTs and Strengthening the Role of NGOs

NGOs and CBOs play an important role in developing democracy and building civil society. These non-governmental organizations promote democracy by giving people the opportunity to express their points of view as well as by smoothing the social consequences of the process of economic transition with the help of alternative mechanisms to solve important social tasks. Non-governmental organizations are an important tool for expansion of participation in decision-making. At this modern stage of Azerbaijan's development when mobilization of non-renewable natural resources, primarily hydrocarbons, is the driving factor of development, expansion of people's participation in decision making and realization of their right to take part in national and regional projects is of great importance. Participation in planning, management and control of revenues obtained from the use of non-renewable natural resources for the goals of sustainable development and formation of human gold, is one of the most important tasks of NGOs.

New IT considerably expand the capabilities of NGOs. For instance, the Internet opens broad opportunities for organizational networks of NGOs, which are capable of promptly mobilizing collective actions. Over the past years, there has been an intensive process of establishing NGOs in Azerbaijan. Their activities now cover most aspects of public life. Around 1,500 NGOs have been established. However, the lack of a general database on all the NGOs operating in the country prevents a complete understanding of all their activities. Nonetheless, data collected in the NGO Resource and Training Center provide an overview on the NGO involvement in various fields of public life.

A National Forum of NGOs has been established. As a form of realization of human public activity, NGOs promote involvement of significant human resources in the process of studying and forwarding initiatives on socially important matters. However, an insufficient development of democratic institutions limits the use of NGOs potential in decision-making. The process of growth of the number of NGOs, expansion of the fields of their activity, and dynamics of their contacts with government bodies indicate that the national government understands the necessity for cooperating with non-governmental organizations. The State is displaying interest in NGO activity in terms of training people for new professions. This contributes to professional re-orientation of people and solves some employment problems, to a certain extent.

Expansion of political and civil opportunities for public participation is of prior importance from the perspective of deepening democracy and building a democratic management system. Cooperation among NGOs can be seen in various projects such as the Azerbaijan Development Gateway.

Under the existing law, On Non Governmental Organizations, passed in 2000, local NGOs that receive more than 70 percent of their budgets from foreign financing (for example, grants) are prohibited from participating in monitoring elections. Taking into account that the activity of practically all NGOs in Azerbaijan is funded primarily by foreign agencies, the this effectively eliminates local non-government institutions from the process of monitoring the elections.

It should be noted that local NGOs had been able to avoid such provision of the law prior to the, referendum of August 24, 2002. For example, members of local NGOs were engaged in monitoring the elections as representatives of various media outlets. However, according to a decision of the Central Electoral Commission since July 2003, only members of the staff of mass media are permitted to participate in monitoring the elections.

Controversy over the situation and application of this Law is also related to the fact that the very foreign organizations which fund local NGOs have the right themselves to participate freely in the process of monitoring elections in Azerbaijan.

Of special concern to Non Governmental Organizations is the Law on Grants under which any legal or physical entity, which has received a grant, is obliged to register a relevant agreement with “an appropriate state body”. Although this change in Law does not impose any restrictions for receipt of grants and is directed solely at the provision of transparency in this field; it is, however, not denied that in the conditions of undeveloped democratic institutes, this provision may cause additional mechanisms of control in this field and limitation of funding, according to representatives of some NGOs.

Despite the complexity of interrelations between the government and NGOs in Azerbaijan, the tendency for constructive cooperation is progressing. To develop and deepen such relationships, the government needs to establish enough space for NGO activity and involve

them in the solution of socially important problems. The respective legal base has already been established in the country for the development of NGOs. The national Parliament has adopted a special Law that regulates the activity of NGOs. Also an NGO working group has been established to work on the State Program for NGOs development. This draft identifies some of the problems of non-government organizations, in terms of the complicated process of official registration. The State Program assumes the responsibility of establishing an NGO Institute, which will aim at strengthening the capabilities of public organizations.

There is significant potential for the development of such form of NGOs, and CBOs in the country. This form of participation in decision-making is traditional for the national culture and has the perspective to optimally mobilize resources for sustainable development and the formation of human gold.

Table 4.18 NGO Distributions on kinds of activity, according to data provided by NGO Resource & Training Center

	Name of the Sector	NGOs
1	Education & Science	11.7%
2	Economy	8.7%
3	Culture	8.5%
4	Morality & Health	15.6%
5	Gender	3.5%
6	Human Rights & Legislation	14.7%
7	Humanitarian	27.6%
8	Ecology	7.4%
9	Media & Information	2.3%

Source : Profile, 2003

Box 4.8. NGOs - Partners of the Azerbaijan Development Gateway

Center for Economic-Legal Enlightenment
Organization of Young Azeri Enlighteners
Center of Education for Youth
International Eurasian Foundation for Press
Informative Center of NGOs
Azeri Diabetic League
Azeri National Forum of NGOs
Debates in Civil Society
Independent Consumers Union
Institute for Peace and Democracy
TUTU Center for Children Culture
Center of Azeri Women and Development

Box 4.9. ICT, Public Participation and Social Protection

Compulsory contributions to the State Social Protection Found are collected from two main sources: employers and workers. The World Bank is involved in the Social Protection Reforms and is participating with Government in three areas: pensions, social assistance and labor market issues. The first stage will focus on the development of individual records for all beneficiaries. The second stage will begin an incremental system to collect premiums, invest them, and begin paying benefits out of investment. A massive ICT job will be required to deal with the practical problems of computerization including inherent problems of administrative capacity, transparency and public participation, available telecommunication services and energy supply.

Box 4.10 E-Governance: recent practices

The State Customs Committee has been one of the very first state agencies applying ICT for more efficient and transparent internal management. On-line real-time mode of the data transmission network is functional between the SCC HQ and 34 customs checkpoints in the various regions across the country being the first ever experience of the Wide Area Network in Azerbaijan. Anti-smuggling software and database have been introduced. The third stage of the project is currently introducing automated customs clearance and control system brand new approach to the Customs clearance procedures in the country.

The Ministry of Foreign Affairs currently implements a pilot project which aims at demonstrating the merits of modernizing management and introduction of ICT in order to become a capable and well-managed sustainable Government Ministry. The project sponsored significant technological input into the MFA through the purchase and installation of information technology equipment and implementation of a series of e-governance activities that enables Ministry to fulfill its mandate in a responsive and fully professional manner.

The State Agency on Standards, Metrology and Patents is trying to modernize its operations in line with internationally accepted ICT standards. This would enable the Agency to conduct its responsibilities in the most efficient, transparent and accountable manner, thus increasing its overall effectiveness. The initiative strengthens the existing opportunities for partnerships that will prevent access of illegal and low-quality products onto the consumer market.

4.6. Conclusion

Despite of hardships of the transitional period, Azerbaijan is continuing to move towards democratic and economic reforms. Objective and subjective reasons, which prevent a more dynamical process, are the result of both the complex geopolitical situation in the region and the inertia of the administrative bureaucratic system. The existence of the unresolved conflict over Nagorno Karabakh, which is part of Azerbaijan's territory and is currently under occupation, as well as existence of an enormous number of refugees and IDPs are factors preventing accelerated reform, based on the use of modern ICTs. Despite all this, the country has achieved notable success in using modern technologies for further expansion of access to information, expansion of public participation and development of democracy on the whole.

Progressive measures in this field should take into consideration the following:

- Expansion of ICTs promotes public awareness. This is more and more evident in Web sites operated by mass media, and in the growing use of the Internet;
- Expansion of ICTs promotes public participation in decision-making and the implementation of reforms. This is promoted by the creation of Websites by Ministries and other governmental institutions, and the availability of interactive contacts with both government bodies and mass media. Promotion of public participation also contributes to the development of NGOs and CBOs and their being equipped with modern ICTs;
- Using modern ICTs in the process of education and selection of students is an important condition in the formation of human capital. Foreign oil companies operating in Azerbaijan have also contributed to this process;
- A State Program for ICTs has been adopted, which will serve as one of the most important tools of human development and creation of human gold. However, there are considerable problems related to using ICTs for further progress of public awareness and democracy. These include:
- General shortages in the provision of modern ICT and insufficient preparation for using them;
- Existence of large differences in provision and preparedness for the use of ICTs and the development of a knowledge based community depending on age or region;
- Not all State agencies have Websites. Most are not kept up to date.
- The solution to these tasks is a prerequisite for fostering further human development in the country and the formation of human gold. The following steps to prepare citizens, enterprises and public for using ICTs seem to be essential:
- Improvement of a National Statistics Indicators System by the State Statistics Committee to ensure the possibility of monitoring the country's readiness for using ICTs and in making international comparisons.

- Further work to actualize information provided by Web sites of public agencies (Ministries, Committees and other similar bodies) is required, as in many cases the information they provide is outdated and cannot be considered realistic. Simultaneously expansion of Websites is required to enable State bodies to cover all public structures, along with provision of interactivity with Web visitors.

- Stronger efforts are requested of the Ministry of Communications to decrease of tariffs for Internet access, thus making Internet available for a wider circle of users, and NGOs, in particular.

GENERAL CONCLUSION

- MDGs for poverty reduction and human development are taken as compulsory priorities of State policy and the Azerbaijani community. This reflected in the adopted Poverty Reduction Strategy (2003) and will receive development in a series of national programs for the solution of key tasks of MDGs.

- It is apparent that a national initiative alone is not sufficient for the country to solve the problem of poverty and to promote human development. The Azerbaijani community is showing that they are open to and understand international initiatives on human development and are cooperating with international agencies involved in initiatives for human capital development.

- The understanding of the role of knowledge, development and application of modern technologies in the achievement of human development goals has made relevant efforts one of the priorities of national policy. This is reflected in the development of the National ICT Strategy, as a key component for development and spread of knowledge and technologies.

- The consequences of the 1990-1995 economic crisis led to the decrease in GDP production, decrease in financing of research and developments and, finally, to the reduction of the population's opportunities in access to education and knowledge. These consequences, typical for countries with transition economies, still remain obstacles for the development of knowledge and the spread of technologies, despite the economic growth that has taken place in the past seven years.

- The Azerbaijani community is displaying a readiness to move towards technological progress applying a strategy that simultaneously respects mutual stimulation of economic growth and technological progress.

- ICT development is an important tool, which will influence both State agencies, civil society institutes, economic and business sectors and social institutes, science, education and culture.

- Along with the existing obstacles, which the community must overcome, to develop and spread ICT (for example, economic problems, regional and gender disparities in access to ICT), attention must be given to new problems and obstacles.

- Initiatives in the field of State policy will play an important role in the achievement of the goals of ICT development and ICT diffusion. Particular attention must be paid to reducing regional differences in access to ICT and, in particular, access to Internet. Azerbaijan today has a chance to learn from other international examples, and may have the chance to leapfrog certain technical innovations, thus building up an even more modern and effective communication network. In an effort to solve ICT development-related problems, it is also important to avoid technological incompatibility of systems being used that could negatively affect the solution of the problem as a whole.

- Diffusion and application of ICT, in particular of the Internet, will increase the degree of the population's awareness of new ideas and developments in sciences and technologies, as well as activities of public and civil institutes. In this context, under realization of the National ICT Development Strategy, citizens' democratic participation is expected to expand.

- Support of ICT and modern technologies' development by international organizations in Azerbaijan is important in the context of national initiatives and MDGs in the Republic. Given its unique geographical situation, each long range project employing modern technologies, including development of ICT, can have a regional impact, and encourage integrational processes, necessary for international cooperation, stability and regional security.

APPENDIX TABLES

1. PROFILE OF HUMAN DEVELOPMENT

Year	Life expectancy at birth - (years)	Maternal mortality rate (per 100,000 live births)	Population per doctor	Scientists and technicians (per 1,000 people)	Enrollment ratio, ages 6-23 (%)	Tertiary full-time equivalent gross enrollment ratio		Daily news papers (copies per 100 people)	Tele-visions (sets per 100 people)	GDP per capita (USD)
						Total (%)	Female (%)			
1998	71.6	41.1	279	1.4	62.2	82.9	29.9	22.3	86.0	570.6
1999	71.6	43.4	277	1.4	62.0	81.4	30.3	24.1	89.0	583.0
2000	71.8	37.6	273	1.4	71.0	80.4	31.7	23.5	90.0	664.5
2001	71.9	35.1	270	1.4	71.7	80.5	33.5	22.7	92.1	715.4
2002	71.9	32.3	268	1.4	73.2	80.3	34.1	22.9	93.2	756.3
2003	73.3	32.3	268	1.4	73.2	80.3	34.1	23.0	94.0	879.7

2. DEMOGRAPHIC PROFILE

Year	Population (thousands)	Annual population growth rate (%)	Total fertility rate	Contraceptive prevalence rate (%)	Dependency ratio (%)	Popula-tion aged 60 and over (%)	Life expectancy at age 60 (years)	
							Male	Female
1960	3,815.7	3.1	5.10	...	...	...	...	...
1999	8,016.2	0.8	2.00	2.8	71.7	9.0	...	...
2000	8,081.0	0.8	2.00	2.9	75.7	9.2	...	...
2001	8,141.4	0.8	2.00	2.4	74.3	9.4	8.6	15.1
2002	8,202.5	0.8	2.00	2.5	73.2	9.5	8.6	15.1
2003	8,266.0	0.8	2.00	2.5	73.2	9.5	9.5	15.1
2015	9,400.0	0.8	2.00	2.8	...	9.8	...	...

3. EDUCATIONAL PROFILE

Year	Enrollment ratio, ages 6-23(%)	Upper-secondary full-time equivalent gross enrollment ratio	Upper-secondary Technical enrollment (as % of total upper-secondary)	19-year olds in full-time education (%) 1996-1998	Tertiary natural and applied science enrollment (as % of total tertiary) 1996-1998	Annual public expenditure per tertiary student (USD) 1996-1998	Public expen-diture on education (as % of GDP)
1998	71.0	98.0	9.9	14.1	31.6	120.4	3.5
1999	**71.0**	**86.0**	**9.9**	**14.0**	**31.1**	**132.3**	**4.8**
2000	**71.0**	**88.0**	**9.9**	**14.0**	**29.9**	**138.1**	**3.8**
2001	**71.0**	**89.0**	**9.9**	**14.0**	**28.5**	**139.0**	**3.5**
2002	**73.2**	**89.0**	**9.9**	**14.0**	**28.2**	**143.0**	**3.5**

4. HUMAN CAPITAL FORMATION

Year	Average years of schooling			Scientists and technicians (per 1,000 people)	Expenditure on research and development (as % of GDP)	Upper-secondary graduates (as % of population of normal graduate age)	Tertiary graduates (as % of population of normal graduate age)	Science graduates		
	Total	Female	Male					as % of total graduates 1997-01	% female 1997-2001	% male 1997-2001
1998	10	9	11	3.2	0.3	52.2	18.7	1.7	32	68
1999	10	9	11	3.2	0.2	54.4	19.1	2.1	31	69
2000	10	9	11	3.3	0.3	56.8	18.4	1.3	35	65
2001	10.5	10	11	3.3	0.3	56.9	18.9	1.0	36	64
2002	10.5	10	11	3.3	0.3	57.1	18.8	1.0	37	63
2003	10.5	10	11	3.3	0.3	57.3	18.8	1.0	37	63

5. INFORMATION COMMUNICATION TECHNOLOGY PROFILE

Per 1,000 people					
Telephone main lines		Mobile telephones		Internet hosts	
1990	**2002**	**1990**	**2002**	**1990**	**2002**
72.5	103.6	0	96.8	0	4.0

Table 6. Production, Gross Domestic Product (at constant prices 1996)

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003
GDP per capita - national currency, 000 AzM	4560.0	1784.0	1787.6	1873.4	2039.6	2171.9	2393.6	2609.9	2863.7	4,320.0
- US$ current exchange rate	346.3	319.3	416.2	513.2	570.6	583.0	665.0	715.4	756.3	879.7

Source : SCS, 2003

Table 7. Inflation, debt and international assistance and aid

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Inflation: % change in consumer prices	+84.6	+6.8	+0.4	-7.6	-0.5	+2.2	+1.1	+3.3	+3.6
Budget deficit % of GDP	5.2	6.8	2.4	1.8	2.4	1.0	0.4	0.4	0.1
Balance of payments deficit, % of GDP	0	-0.9	+1.1	+0.4	+5.0	+5.2	+4.7	+4.6	..
External public and private debt service % of exports	0.4	0.9	5.8	1.2	4.2	4.5	4.8	5.0	..

Source : SCS, 2003

Table 8. Public revenue and expenditure (at constant prices 1996)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Public revenue -per capita ('000AzM)	267.1	264.6	316.7	276.8	322.8	362.9	383.5	441.1	547.0
-% of GDP	14.9	14.7	16.2	13.5	14.8	15.1	14.7	15.4	17.5
Public consumption expenditure -per capita ('000AzM)	316.7	317.0	350.1	315.7	377.4	389.3	396.6	449.7	550.1
-% of GDP	20.1	17.6	18.6	15.4	17.3	16.2	15.2	15.2	17.6
Public expenditure on total social objectives* -per capita ('000AzM)	139.8	159.1	171.3	178.4	200.7	204.3	200.9	226.3	238.8
-% of GDP	7.8	8.8	9.1	8.7	9.2	8.5	7.7	7.9	8.9
Public expenditure on health -per capita ('000AzM)	25.1	26.4	22.6	18.4	21.8	21.6	20.9	22.9	24.8
-% of GDP	1.4	1.5	1.2	0.9	1.0	0.9	0.8	0.8	0.8
Public expenditure on education per student ('000AzM)	292.0	305.2	298.7	304.7	402.6	401.6	398.6	400.2	..
Public expenditure on social transfers (pensions, unemployment benefits, etc. - per beneficiary; national currency)	..	..	..	..	..	..	..	..	..

Source : SCS, 2003

Table 9. Poverty

	2001
Persons in absolute destitution as % of total population (MDG)*	..
Poverty gap ratio**	..
Persons in absolute poverty as % of total population***	49.0
Persons in relative poverty (below 60% of national median income) as % of total population	17.0
Average expenditure on food as % of total consumption expenditure****	68.3

*Persons in households having insufficient income to purchase required food.
** (Incidence x depth) of absolute destitution
*** Persons in households having insufficient income to purchase required food and/or other necessities.
Source : SPPRED , SCS (Household budget survey in 2001)

Table 10. Health Services

	1990	1995	1996	1997	1998	1999	2000	2001	2002
Per capita total expenditure on health (public and private) at current prices 1000 manat	..	..	..	..	..	..	..	36.0	85.0
Per capita health expenditure by private households at constant prices	..	..	..	..	..	..	..	..	..
Potential access to health services (Additional area)	..	..	..	..	..	..	..	..	..
Realized access to health services (Additional area)									
% of children immunised total(MDG)*									
- pertussis, diphtheria, scarlatine	92.1	95.9	95.8	94.5	97.4	98.8	98.4	98.2	97.4
-polio	95.7	98.0	97.3	98.3	98.1	99.7	98.5	95.8	99.1
-measles	83.3	97.0	98.5	96.6	97.7	98.0	98.1	98.9	98.8
- tuberculosis	98.6	93.0	90.0	93.6	96.4	98.7	97.9	98.5	99.1
% of births attended by skilled health personnel (MDG)									
Contraceptive prevalence rate	1.2	0.9	1.4	2.0	2.7	3.3	3.8	4.0	3.3
of which: Condom use rate (MDG)	..	..	..	..	..	..	..	..	..

* Data by sex not available .
Source : SCS Household budget survey in 2001 and 2002

Table 11. Demographic background (end of year)

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population										
%men	48.8	49.2	49.3	49.3	48.8	48.9	849	49.0	49.1	49.0
%women	51.2	50.8	50.7	50.7	51.2	51.1	51.1	51.0	50.9	51.0
%urban										
-men	..	..	..	..	24.8	..	..	..	..	..
-women	..	..	..	..	26.2	..	..	..	..	..
-total	53.9	52.4	52.0	51.8	51.0	51.0	50.8	50.7	50.7	51.0
%rural										
-men	..	..	..	..	24.0	..	..	..	..	..
-women	..	..	..	..	25.0	..	..	..	..	..
-total	46.1	47.6	48.0	48.2	49.0	49.0	49.2	49.3	49.3	49.0
%under 15										
-boys	..	..	..	..	16.4	..	..	..	..	..
-girls	..	..	..	..	15.4	..	..	..	..	..
-total	32.9	32.3	31.8	31.6	31.8	30.8	29.8	28.7	27.4	30.0
%65 and over										
-men	..	..	..	..	2.2	..	..	..	..	..
-women	..	..	..	..	3.3	..	..	..	..	..
-total	4.8	5.5	5.7	5.7	5.5	5.7	6.0	6.3	6.6	9.0
Total fertility rate	2.8	2.3	2.1	2.1	2.0	2.0	1.9	1.8	..	..
Natural increase per 1,000 population	20.3	12.2	10.6	11.0	10.0	9.0	8.9	8.1	8.0	7.9
Total increase per 1,000 population	12.3	10.9	9.6	10.0	9.4	8.4	8.2	7.5	7.7	7.7
Dependency ratio	60.8	60.6	60.0	59.5	59.5	57.6	55.6	53.6	51.6	..
If relevant to the country:										
% ethnic minority population as nationally defined*	7.31	-	-	-	9.4	-	-	-	-	-
% refugees and internally displaced persons**				10.8	9.9	9.8	9.8	9.6	9.6	9.6

* 1990 and 1998 based on 1989 and 1999 Census accordingly
** Excluding settlers from the front-line regions with Armenia (including of this total number refugees and internally displaced persons are 1 million)
Source: SCS, 2003

Table 12. Environment risk, management and protection

	1990	1995	1996	1997	1998	1999	2000	2001	2002
Budgetary funds allocated to environmental protection and relief, per capita (1996 prices), manat	8,624	4,481	2,498	1,318	2,225	654	817	600	1,146
Proportion of land area covered by forest (MDG)	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
Area protected to maintain biological diversity									
(% of total land) (MDG)	1.4	1.7	1.7	2.2	2.2	2.2	2.2	2.2	2.2
Unit of energy use (kg oil equivalent) per unit of GDP kg/1,000 manat (MDG)	2.09	2.58	..	..	..	1.66	1.59	..	..
% of total energy obtained from renewable source	..	..	..	..	..	..	..	..	..

Source: SCS, 2003

Table 13. Principal air pollutants

	1990	1995	1996	1997	1998	1999	2000	2001	2002
Pollutant									
Carbon dioxide (CO* (MDG)	9.9	2.9	2.5	3.0	2.8	2.8	3.3	3.5	2.7
Ozone depleting CFCs* (MDG)	..	..	..	..	..	..	..	..	..
Sulphur dioxide (SO_x)*	12.7	6.6	5.3	5.0	4.5	4.7	4.5	1.8	1.7
Nitrogen dioxide (NO_x)*	18.3	4.2	3.2	3.4	3.3	3.1	3.1	3.4	3.3
Volatile organic compounds*	..	..	..	..	..	..	..	..	..
Toxic waste*		3.6	2.4	4.7	4.4	1.7	3.4	2.1	1.2
Proportion of population using solid fuels (MDG)	..	..	..	..	..	..	..	..	..

*Kg per capita
Source: SCS, 2003

Table 14. Human development index

	1995[a]	1996[a]	1997[a]	1998[a]	1999[a]	2000[a]	2001[b]	2002[b]	2003[b]
Indicator values									
Adult literacy	96.3	96.3	96.3	97.3	97.3	98.8	98.8	98.8	99.0
Combined gross enrolment ratio	72.0	71.0	70.0	71.0	71.0	71.0	71.0	71.0	71.0
Expectation of life at birth	69.1	70.2	71.2	71.6	71.6	71.8	71.9	72.2	73.2
Per capita GDP (PPP)	1,590	1,675	1,740	1,850	2,850	2,936	3,148	3,300	3,650
Index values									
Education index	0.880	0.868	0.871	0.878	0.880	0.895	0.895	0.897	0.897
Life expectancy index	0.735	0.753	0.770	0.772	0.770	0.780	0.782	0.786	0.805
GDP index	0.462	0.470	0.477	0.510	0.560	0.563	0.576	0.586	0.600
Human Development Index	0.692	0.697	0.706	0.722	0.738	0.746	0.751	0.758	0.767

[a] UNDP, HDR 1995-2001
[b] National measurements